Radio Controlled
Soaring Digest
January 2017
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Photo by Adam Fisher.
Nikon D200, ISO 320, 1/4000 sec., f5, 185mm

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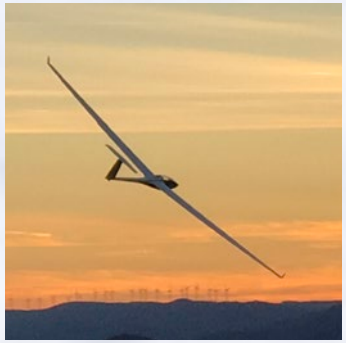

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Nikon D200, 1/800 sec., f8, 50mm

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In the Air

RC Soaring Digest has not accepted advertising for over a decade, relying instead on donations from "subscribers." This has allowed *RCSD* to be neutral when it comes to reviews of aircraft, radio gear, computer software, and other items of interest to RC soaring enthusiasts. This is our long-term commitment.

We received a message from Gordy Stahl a few days ago in which he mentioned the relatively new Slite 2M RES from SETA Modelltechnik. The link Gordy supplied took us directly to the German language Slite 2M page. <http://seta-tech.de/themes/kategorie/detail.php?artikelid=19&source=2&refertype=11>, [English version <http://tinyurl.com/grzqwgx>]. The Slite 2M is developed from the PURES 2M which has had very good reviews elsewhere, and is available either as a conventional X-tail or as a V-Tail. With a single center-mounted spoiler there's no need to purchase any more than three servos, regardless of tail configuration. Price: €169,00, including VAT and excluding shipping.

With the rapid growth of interest and participation in this event, it's only natural that we would mention this new addition to the roster of F3-RES aircraft.

Time to build another sailplane!

Sverrir Gunnlaugsson, sverrirg@gmail.com
Additional photos by Pierre Rondel

The third FAI world championships in F3F were held near Hanstholm in Denmark from October 2. to 9. this year. 20 nations sent contestants and in total there were 59 pilots registered with 2 of them being in the junior category.

Some of the teams arrived as early as a week before in order to get in some practice, suffice to say the got a lot of wind as it went above 30 m/s during some of days. The contestants and gliders were processed on Friday and Saturday evening.

Leszek Durczak flying his Respect, he's also the manufacturer.
Title page: Aubry Gabanon flying.

Pierre Rondel with his Shinto. Photo by Pierre Rondel

Right in the lift band.

Officials were well dressed.

Reto Blumer with his Viper.

A pre-contest open for pilots, helpers and contest officials was held on October 1. and 2. but as the weather was too good, only one round, in three groups, was finished over the two days and the low wind buzzer came on more often than not making for quite a few reflights.

Opening ceremony was held at 16:00 hours on October 2. followed by a team manager meeting at 19:00 to go over a few things regarding the competition. Briefing on the slope would be held at 8:30 every day with the flights scheduled from 9:00 – 18:00 and no new groups started after 17:00.

Monday October 3.
First contest day and flying would be started on the Hamborg slope that was the highest slope flown at 35 meters height. Although Hamborg is one of the best slopes the landing area can be a bit turbulent and a few models got damaged on their way down. As the wind picked up one pilot was heard commenting this was probably how laundry feels in the

Mark Redsell launching Simon Thornton's Shinto.

A Swiss racer in the turn.

washing machine! Four rounds were flown and the fastest time was 35.70 flown by Lukas Gaubatz from Austria. Wind was 17 to 19 m/s.

Tuesday October 4.
We moved over to the 12 meter high Vigsø slope that was within walking distance for many of the pilots staying at Vigsø holiday center. The day started very calm, so calm that the first pilots didn't go out until 10:00. The flights were mostly uneventful but few pilots managed to clip a brush on the hillside. After the sixth round it was announced that round 2 would be reflown due to protest that was filed regarding a buzzer sounding late when one of the contestants was flying. So even though four rounds were flown we had only finished seven rounds so far. The fastest time was 42.24 flown by Radovan Plch from Czech Republic. Wind was 3 to 10 m/s.

Another Shinto in the turn.

Jan Hansen contest director.

CD Jan Hansen holding a morning briefing.

Ron Vann throwing for Team USA.

Wednesday October 5.
The wind was blowing hard when morning came and the 25 meter Kridtvejen slope was flown. Though it's a bit lower than Hamborg this was almost a perfect slope to fly in with big landing area that was relatively free of turbulence. As the wind was so good and all the pilots were ready first flight was at 8:45 and 5 rounds were flown with fastest time 35.28 by Helge Borchert from Germany. With 12 rounds flown contestants are starting to claim the top places but with a difference of 600 points from first to fifth place anything can happen in the next few days! Wind was 11 to 17m/s.

Thursday October 6.
The wind was blowing even harder today so lot of fast times were flown including what would turn out to be the fastest time in the WC, that was 32.08 flown by Markus Meissner from

Above: Kaj Henning Nielsen still competing in the top tier at 72 years of age.

Above right: William Jul Ringkjob checking the wind.

Right: Just a small part of the crowd.

Pierre Rondel with his Shinto.

Pierre Rondel with his Shinto.

The last moments.

Do you need a Shinto to qualify for the French team?

Switzerland. Four rounds and the first group of round 17 were flown today. Wind was 17 to 22 m/s.

Friday October 7.
The wind had died down a bit from yesterday but as the day progressed it came back. The second group in round 17 finished their flights and then four more rounds were flown with the total being 21 valid rounds on the scoreboard. The fastest time 36.30 was flown by Vladimir Simo from Slovakia. Currently only 8 points seperate the two top contestanst, Thorsten Folkers and Helge Borchert from Germany so a lot can happen tomorrow! Wind was 13 to 18m/s.

Saturday October 9.
As the wind had changed direction we headed out to the Vigsø slope to fly the last three rounds of the contest. Fastest time today was 36.54 flown by Siegfried Schedel from Germany. Not much happened today and the top 5 contestants held their place till the end. The award ceremony started at 19:00 in the evening and was followed by a banquet in the Vigsø holiday center. Suffice to say lot of fun was had all around! Wind was 15m/s to 10m/s.

Results
Thorsten Folkers from Germany is the new world champion in F3F, second place Helge Borchert from Germany and third place Pierre Rondel from France. In the junior category Antek Kania from Poland is the junior world champion and Max De Vrueh from the Netherlands in second place. It will be interesting to follow their progress over the next years. In the team category Germany was first, France second and Denmark in third place.

24 rounds were flown, actually 25 with the dropped round, but out of the 24 rounds only 4 had the fastest time over 40 secounds. If we look at the top 20 speed runs fastest was 32.08 by Markus Meissner from Switzerland and the “slowest” was Mark Redsell from Great Britain with 35.63 and all of these times were flown in rounds 12 – 17.

Finally I would like the thank the Danish organisers and staff for a great event, I‘m sure not even a Swiss clock would have run better than this competition did! The weather was great, dry and bright and plenty of wind to go around for all the contestants. Few hickups from the contest computer but those didn‘t take long to fix and didn‘t delay the contest.

The next F3F world championship is scheduled for 2018 but as of this moment no bids are currently open!

Web sites:

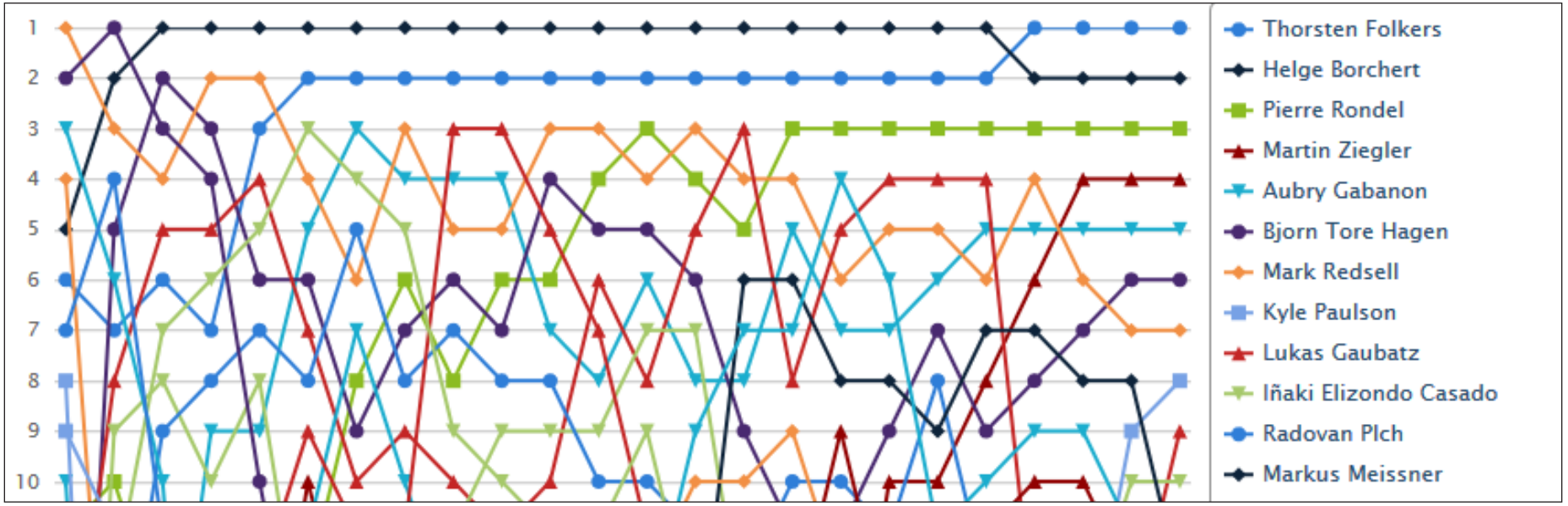
http://wcf3f.dk

http://bit.ly/WC2016F3XVault

Opposite page: Marko Alho with his Fosa Lift.

Above: Photo of the contestants. Photo by Pierre Rondel

Right: World championship staff. Photo by Pierre Rondel



Placing by Round

Pilot rankings

1. Thorsten Folkers GER
2. Helge Borchert GER
3. Pierre Rondel FRA
4. Martin Ziegler AUT
5. Aubry Gabanon FRA
6. Bjorn Tore Hagen NOR
7. Mark Redsell GBR
8. Kyle Paulson USA
9. Lukas Gaubatz AUT
10. Iñaki Elizondo Casado ESP

Team rankings

1. Germany
2. France
3. Denmark
4. Austria
5. Great Britain
6. Norway
7. Swiss
8. Czech Republic
9. Poland
10. Australia
11. Finland
12. Singapore
13. Iceland
14. Israel
15. USA
16. Spain
17. Netherlands
18. Venuzuela
19. Slovakia
20. Hong Kong

Top 10 speed runs

Pilot	Speed	Rnd
1. Markus Meissner	32.08	15
2. Thorsten Folkers	32.25	14
3. Thorsten Folkers	32.93	15
4. Thorsten Folkers	33.91	17
5. Filip Kalensky	34.29	16
Søren Krogh	34.29	14
7. Stefan Bertschi	34.30	15
8. Søren Krogh	34.49	13
9. Frits Donker Duyvis	34.79	14
Kwok-Wai Ho	34.79	14

Right: Winners Helge Borchert, Thorsten Folkers, Pierre Rondel

Below left: Team winners, France, Germany & Denmark

Below right: Juniors, Max De Vrueh (Netherlands) and Antek Kania (Poland)

All photos by or courtesy of Pierre Rondel

Jiri Lenik
model aircraft enthusiast in 1: 1 scale

Text and photos by Elia Passerini, eliapasserini@valdelsa.net
Translated by Mrs Anne Catherine Vassallo

Dear readers,

I have a story to tell made up of men and gliders, starting from the beginning, from when men flew with Zögling and with SG 38 Schulgleiter up to now, where the passion for gliding found fertile ground and an ideal place thanks to the special conditions due to the shape of the land with the presence of hills from where to take off to glide freely in the air.

We are in Raná, the Czech Republic; I'll start the story from here to introduce you to Jiri Lenik.

In the fall of 1932, after a long search, a group of student members of the association of aviation technology of Prague "Akaflieg Prag," found an ideal area where to fly near the town of Louny.

The hills of Ranà were perfect because it was possible to fly with Western and Eastern winds.

The hills of Ranà today.

So, finally, having also overcome some red tape for permits, on 1st September 1932 the whole group from Prague moved to the village of Hradek with two Zögling training gliders (Stamer-Lippisch), rubber ropes for towing, residential tents and all the rest that was needed. The tents were set up among the fruit trees. The gliders were forcibly dragged up to the crest of the hill and on September 2nd they took flight.

The first to take flight was the instructor Erwin Primavesi: he remained in the air for only a few minutes, but, briefly after, on November 13th, aboard his Zögling with a Hi fairing (by the manufacturer Wolf Hirth) he made a real flight lasting 2 hours and 25 minutes.

Thirty-seven students participated in this autumnal camp with a total of 490 takeoffs. Air traffic had become a spectacle for the region and the area of the take-offs was constantly besieged by the public and lookers-on also because various newspapers and Radio Prague give ample space to the news making it sensational.

Exactly 80 years later, September 2nd, 2012 the Gliding Aeroclub Ranà group wanted to commemorate the event, taking off again from the hill with gliders towed by elastic cords as before.
Jiri Lenik, pilot, builder and restorer of gliders, is a member of this club.

Right above: September 2, 1932, Erwin Primavesi ready for takeoff.

Right: Ranà in 1934.

Around the "Hol's der Teufel" for assembly.

Gerhard Maleschka

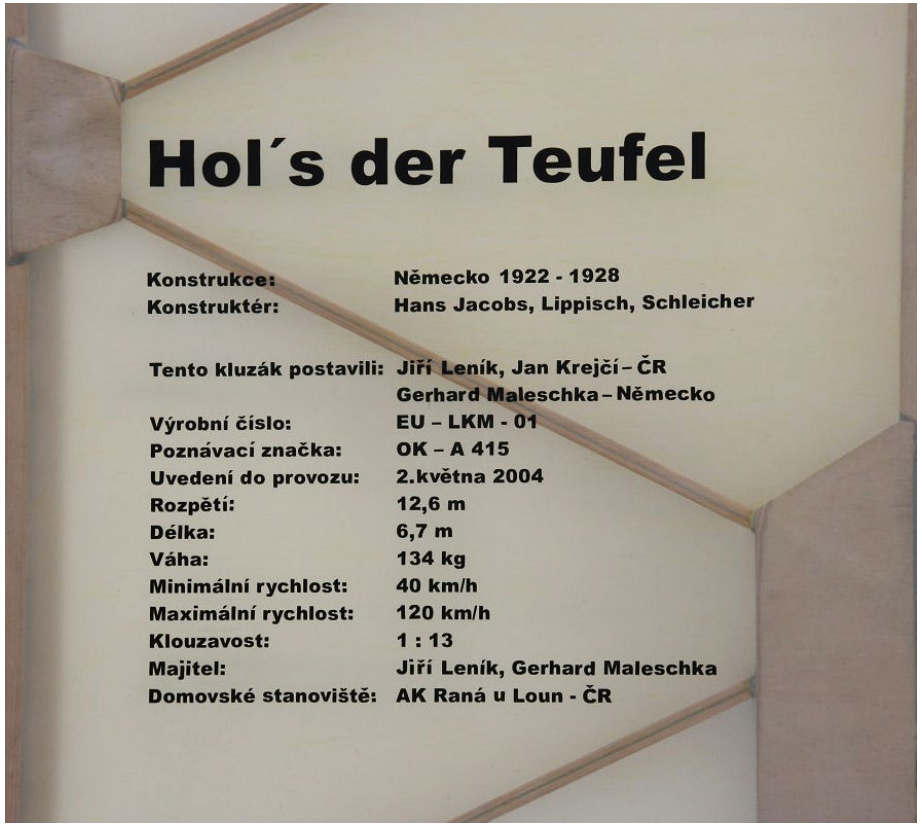
The first time I heard this name was at the 2006 meeting of Angouleme VGC, when, on that occasion he was awarded for the best restoration of the year: a splendid job of the Zlin Z-24 Krajánek, registration number: OK-8560.

For me it was also my first experience of a vintage gliders rally. There were many things to see and to photograph, so I did not pay much attention to this awarding. We met again the following year on the Wasserkuppe and here I had the opportunity to see two of his reproductions made with friends and members of the same club, Josef Mezera, Gerhard Maleschka and Ulf Kern: an SG 38 and especially the beautiful Hol's der Teufel!

How did the latter name come to be? When you're doing a job with hammer in hand and you hit your finger what does the pain make you say? "Damn it to hell!!" And this is what happened in the winter of 1922 - 1923 to Alexander Lippisch's assistant, the Swede Rolf Bergvik who cried out in pain, "Djävlar Anamma" (devils embrace), Hol's der Teufe (get the devil)l!!

As a boy Jiri Lenik dreamed of flying. He began as a model aircraft enthusiast, and immediately after the military service he began attending the club where he became a pilot receiving many awards and various qualifications such as the UL license for gliders; this allowed him to carry out maintenance and even to become a manufacturer.

So in 1999 he began to make his dreams come true. He built his first Alinte, an SG 38 through an accurate documentation and following the original German drawings. Following this, Jiri and his friends decided to build the Hol's der Teufel with UL approval in the Czech Republic.



Left: The "Hol's der Teufel" ready for towing.

Above: The directional with the history and technical data.

The “Hol’s der Teufel” in flight.

The “Hol’s der Teufel” landing.

They had the necessary drawings and the limited number of metal parts facilitated the work. Construction started in 2002 and after 4,000 hours of work on May 2nd, 2004 the Hol’s der Teufel was finished: the replica is Hans Jacob’s original documentation.

The glider is a single-seater hull in plywood; for the classic structure, various types of wood as well as plywoods for aircraft are used together with the adhesive brand Aerodux for the glue. The steel tie rods have a diameter of 2.5 mm, the control cables of 3.2 mm.

The ribs of the wings are mounted on two longerons and the D-box up to the first longeron is made in 1 mm plywood.

Some technical features:
wingspan. 12.6m; length. 6.7m;
weight 134kg; minimum speed: 40 km/h;
top speed 120 km/h; glide ratio: 1:13.

The Zlin Z-24 Krajánek as it was before restoration.

Jiri Lenik along with Erwin Primavesi.

Let's go back now to our meeting in 2007, a year of happy and unfortunately also sad memories.

We were on the Wasserkuppe for a new "Gummiseil" (bungee launch) rally, with pilots coming from all over Germany, Austria and Czech Republic.

The days passed between flights, retrievals, while I took photos, had long chats and drank lots of beer. In the evening we met for dinner at the club's headquarters and sitting next to me was Jiri Lenik and between one beer and another, impelled by curiosity I asked him many questions about his activities:

"How did you start building reproductions of historical gliders?"
"In the case of the Hol der Teufel the idea did not come directly from me, but from my friend Gerhard Maleschka. In Germany, he had already started with the production of aircraft reproductions of the thirties. So we joined forces and passions and started constructing at the Aero Club of Ranà."

Above: The flight instruments of the Zlin Z-24 Krajánek.

Right: The rudder of the Zlin Z-24 Krajánek with the Prague museum logo.

“Do you often fly and since when?”
“I’ve been flying gliders, motor gliders and ultralights like Hol’s der Teufel since 1969. To fly, much depends on the presence of a colleague from the group, although I fly alone, there is always need of help, especially if the glider is unmounted. Just think that to mount the Hol’s der Teufel it takes four expert helpers and two hours and you mustn’t make mistakes.“

“How long did you take to build this glider?”
“We started in 2002 and finished exactly on 2nd May 2004.”

“Did you have problems in finding the right materials?”
“Not many, it was enough to find high quality pine wood, Finnish plywood and then a Polish company did all the metal parts. The main problem was to find a sufficient number of

The Zlin Z-24 Krajánek on tow.

The Zlin Z-24 Krajánek on tow.

friends with good hands to work with. However, a dozen people were around carrying out various duties."

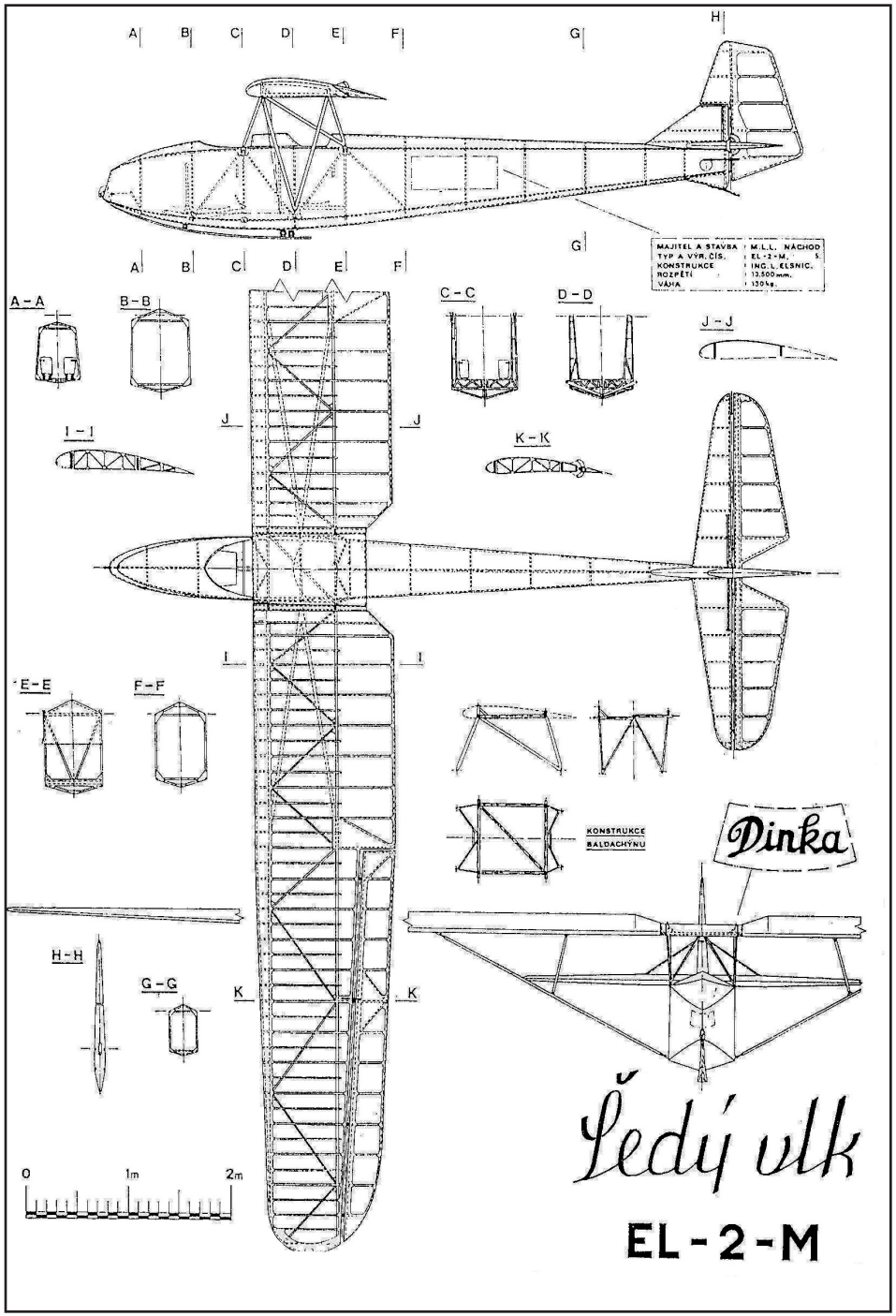
"Did you need a professional for this construction?"
"All the aerial work must be done by professionals. I studied engineering, and since the 70's I was at the airport working on an Orlik. I worked mainly in aeronautical carpentry, so I know all the necessary techniques well enough. Many have turned to our club to repair airplanes of the thirties, a golden age for civilian aircraft."

"How does an ultralight glider behave in the air?"
"There's a big difference between a glider and an ultralight glider. Just because it is smaller it does not necessarily mean it is easier to use, it is the pilot who makes the difference, and his/her sensitivity is essential in any case. It is however a pleasure to fly it, it has a timeless design."

"Is that why you are always present at rallies with this glider?"
"We have traveled with it everywhere and the airplane has always met with great success; no other aircraft is similar to it and there is only one static replication in a German museum. Many pictures have been published in national and foreign newspapers and on calendars even in America and Japan."

Yet another VGC meeting, this time at Achemer; it was 2009 and we met Jiri and his friends again.
Here there was also the Zlin Z-24 Krajánek. After its restoration, this glider is owned by the National Museum of Technology in Prague, where it is kept along with all the necessary licenses for flying.

Unfortunately, the administration rarely grants permission to release it from the museum especially when it comes to



Triptych of the 'EL 2 M "Grey Wolf."

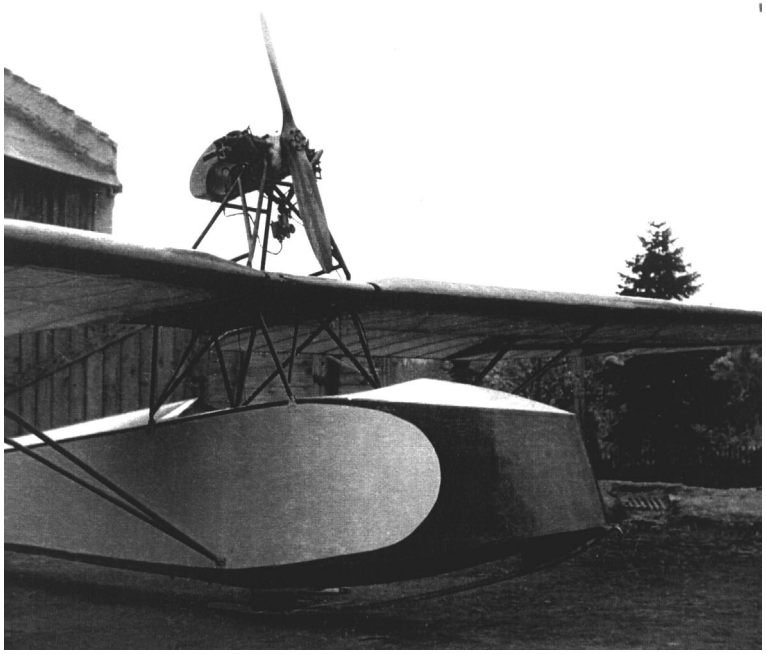
Left: The EL-2-M with the engine in front of the fuselage taking off and in flight.

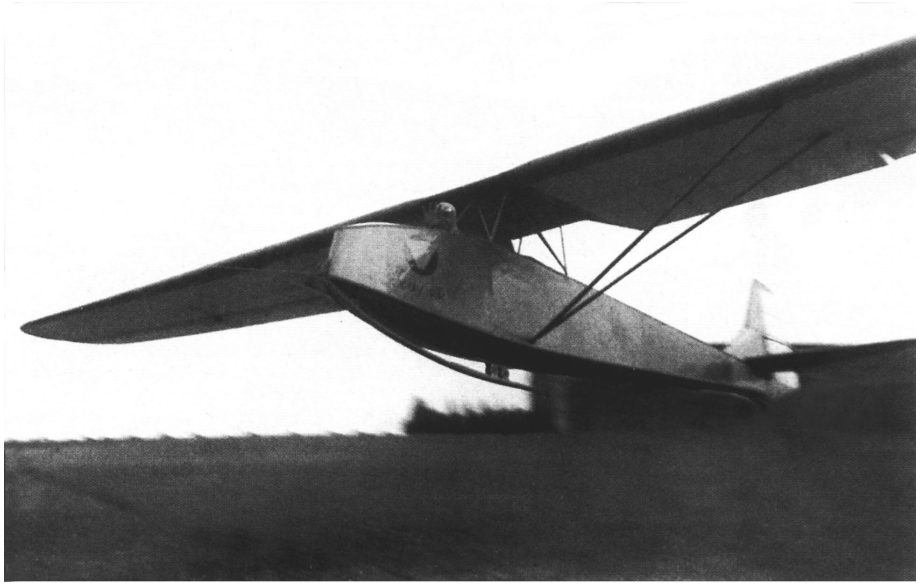
Left below: Slávek Rodovský and the first flight of the "Grey Wolf."

Below: Louis Elsnic ready to take off.

Right and right below: Pictures of flight operations with the EL-2-M with the nose-mounted engine.

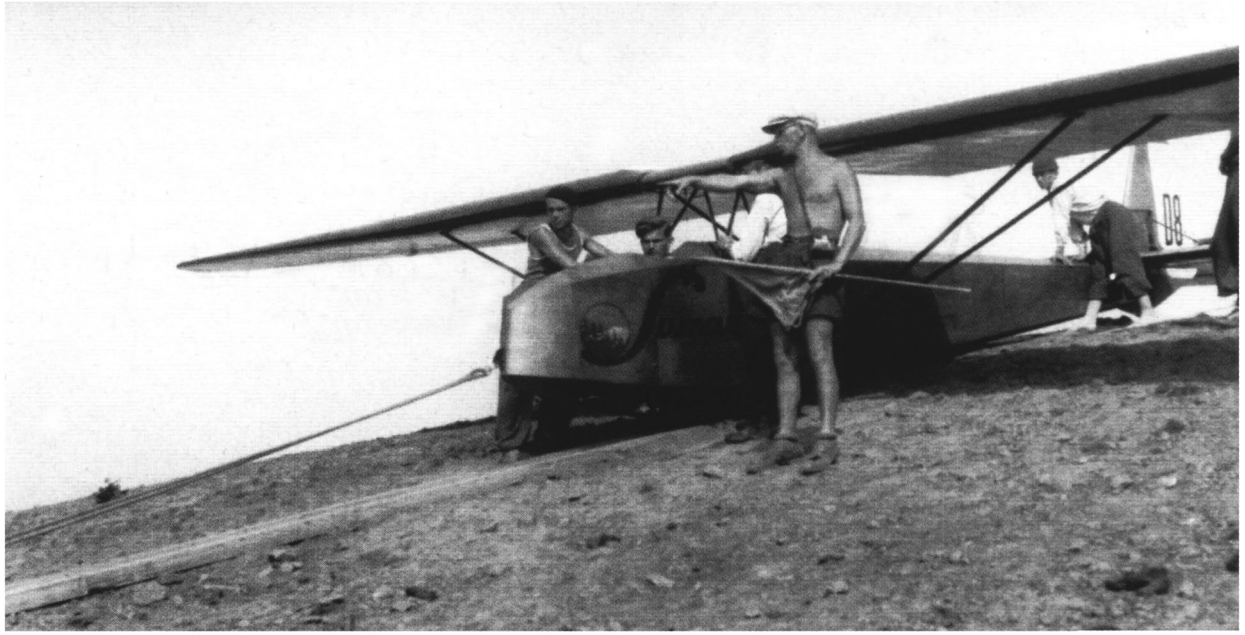
Below: The EL-2-M with the engine mounted on structure above the wing.



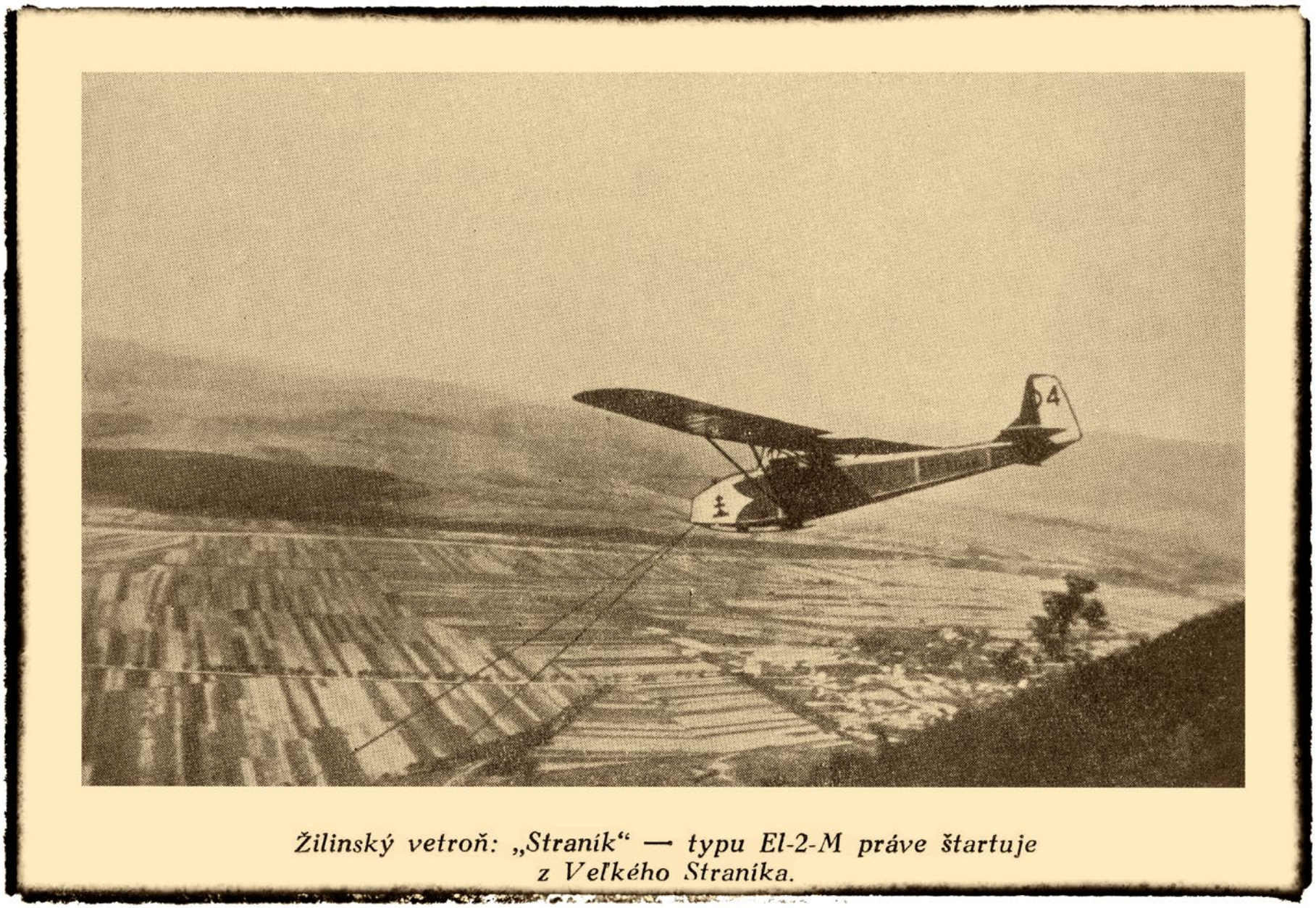


Slávek Rodovský zalétává prototyp větroně EL-2-M Šedý vlk dne 16. června 1934 v Praze-Kbelích

All photos on this page: Pictures of flight operations with the EL-2-M.



EL-2-M „Šumava" s J. Maňákem na III. soutěži plachtařů MLL, startérem byl Ludvík Elsnic (1936)



Žilinský vetroň: „Straník“ — typu El-2-M práve štartuje z Veľkého Straníka.

Bungee launch of the EL-2-M from a hillside.

taking it to a foreign country.

With his restoration work, Jiri achieved a splendid result. This is reflected in the many official awards received, as I already said in 2006, when he was awarded for the best restoration of the year by the then president of the VGC Chris Wills.

On February 20th, 2009, during the awards ceremony for the best sportsmen of 2008, the Journalist Aviation Association awarded Jiri Lenik for his work on the Zlin Z-24 Krajánek.

In the late summer of 2000 this glider came to the restoration laboratories of the Ranà Aeroclub. There was a lot of work to be done, some welds in the metal components were coming apart and almost all the wooden parts had to be redone. The work proceeded at a fast pace and in the spring of 2005, after 4,000 hours of voluntary work Jiri finished the work.

After the Achemer rally I went back home with a lot of photos, drawings, documents and the pleasure of having made new acquaintances, but above all impressed by people, who, like Jiri, have the will and constructive ability to recover, with the utmost simplicity, the history of flight.

Some years passed, and again in 2014 we met at Arnborg in Denmark for the 42nd VGC meeting. We were all back, Jiri, Josef, Gerhard and Ulf, and it was very nice when late in the afternoon, once the flight activities were over we stayed in our tents, with a bottle of beer in hand, telling our life stories. But one evening, in front of a computer with lots of photos, the story got more interesting than usual: what was it about?

It was Jiri's latest effort, the replica of the EL-2-M Šedý Vlk "Grey Wolf" (Grey Wolf), a glider with a wingspan of 13.5 m, length: 6.8 m, wing chord at the root 1:36 m, wing area: 18 m^2, empty weight: 130 kg, ready-to-fly weight: 200/330 Kg, wing load in ready-to-fly status: 11.1 to 18.33 kg / m^2.

The "Grey Wolf" is the second glider in the Czech pre-war history and one of the first which could be motorized. The history of this glider began in the thirties from an idea of the engineers Louis Elsnic, Slávek Rodovský, Jarmila Králová and others to contribute to the relaunching of flying activities with new projects. But the money ...?

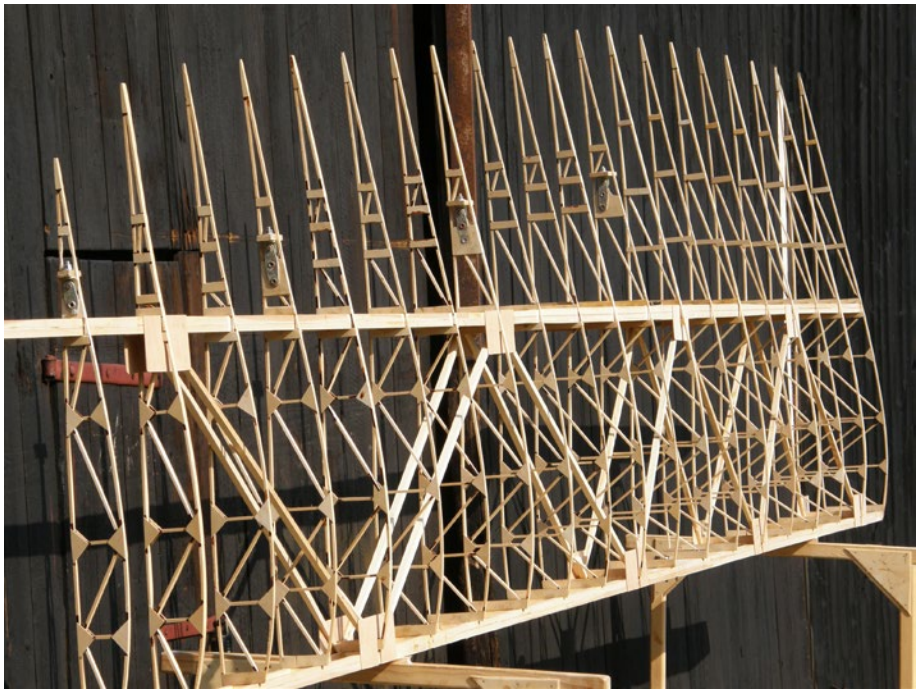
Slávek Rodovský then intervened with his own money and, as we say today, became a sponsor. The project was clear, it was a two-seater with a parasol wing, the passenger in the center of gravity and the possibility to mount a small engine on the first prototypes over the wings and then at the front of the fuselage. The acronym EL-2M comes from this project by the engineer Elsnic in collaboration with the other engineer, Ludvik. The number 2 is perhaps for the two available places and the letter M is for motor.

Construction began late in 1933, with much effort on the part of all the participants in the construction and, finally, on June 15th, 1934 the glider can be said to have been finished and ready to fly, and actually, the next day with the same Slávek Rodovský flying it, it made its first flight attached to a long cable, towed by a car. On June 17th, the first EL-2M prototype remained airborne for 9 hours.

These aircraft also proved to be very robust and supple to carry out aerobatic maneuvers. After having further reinforced the uprights of the wings, it was acknowledged as an aerobatic glider by the Ministry of Local Public Works on 30th May 1935. The exact number of units produced is unknown, 50-60 specimens? Some of these were also equipped with an engine.

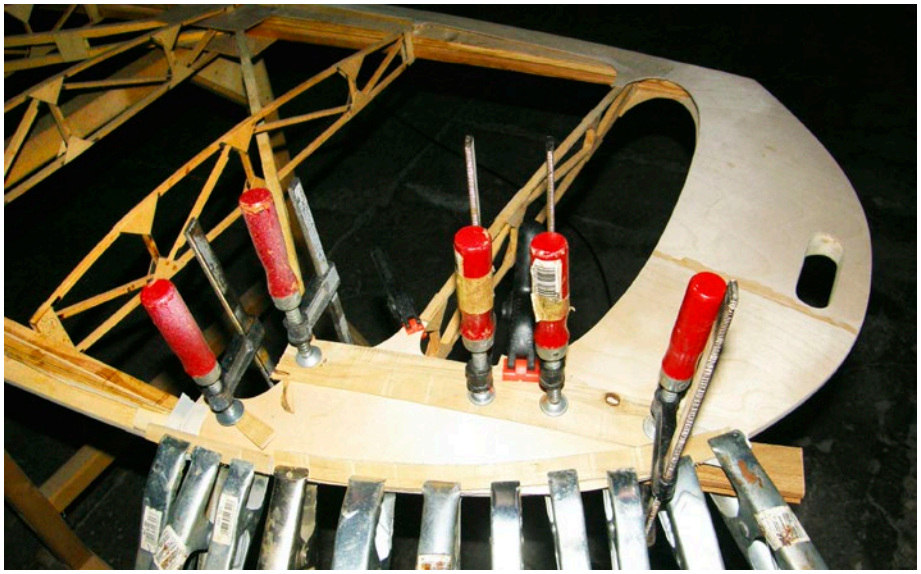
Since 1973, a well-preserved example is displayed at the Aviation Museum in Kbely (Prague).

The El- 2- M is completely built in wood, the wing is divided, two great spars hold together 23 ribs with G633 Profile and the leading edge of the wing is covered with plywood until the first spar. The fuselage, made up of 12 frames, has a hexagonal lattice structure all covered



This and following pages:
Jiri and his work, the replica of the ‘EL-2-M Šedý Vlk (Grey Wolf)


VIP

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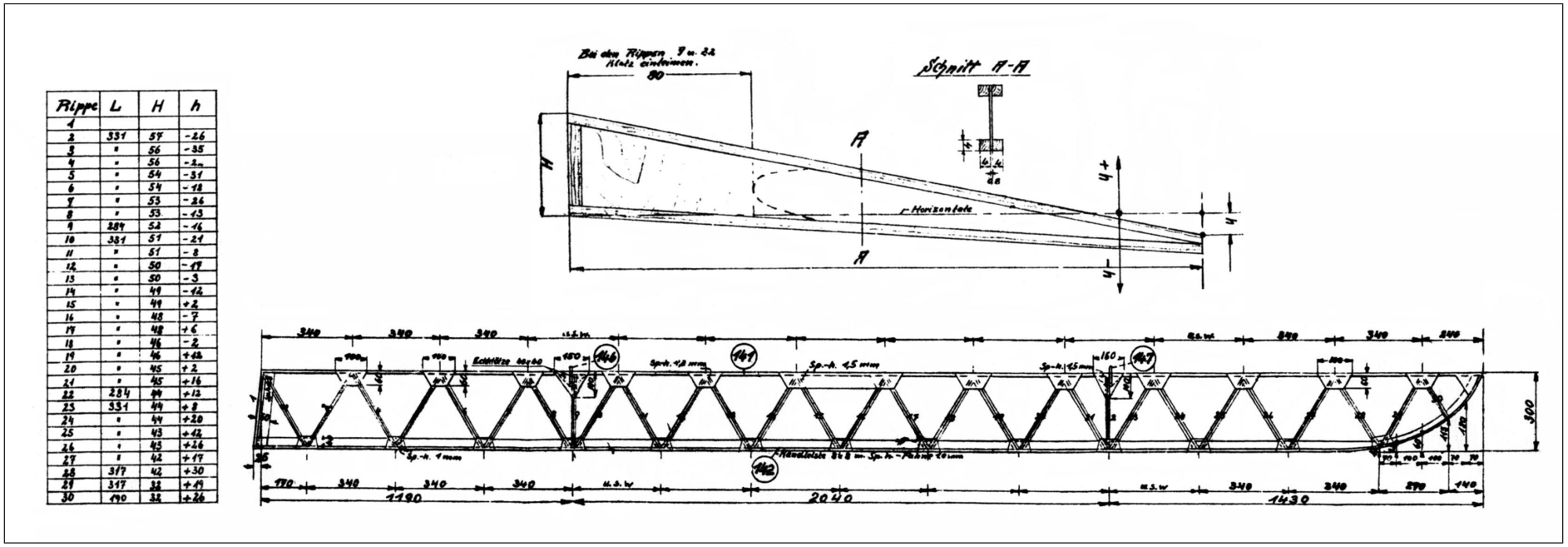


Example of the plans used to produce the reproduction, the right aileron in this case.

in plywood. It is possible to realise that it is a very simple and yet very robust construction.

Since the beginning of 2007 Jiri has been grappling with the replica of this glider, but unfortunately the work has been progressing slowly, as he told me himself, because of the difficulty in finding collaborators for the construction and there have been problems, especially with regards to the steering mechanisms due to the scrupulous inspections by the competent authorities.

That evening around a table, defying even the cold, we stayed up late to see all the pictures and listen to the story of the construction from the beginning until 2014. Many things have been done and some remain to be done, once the work is over, I'm sure it will be a great achievement.

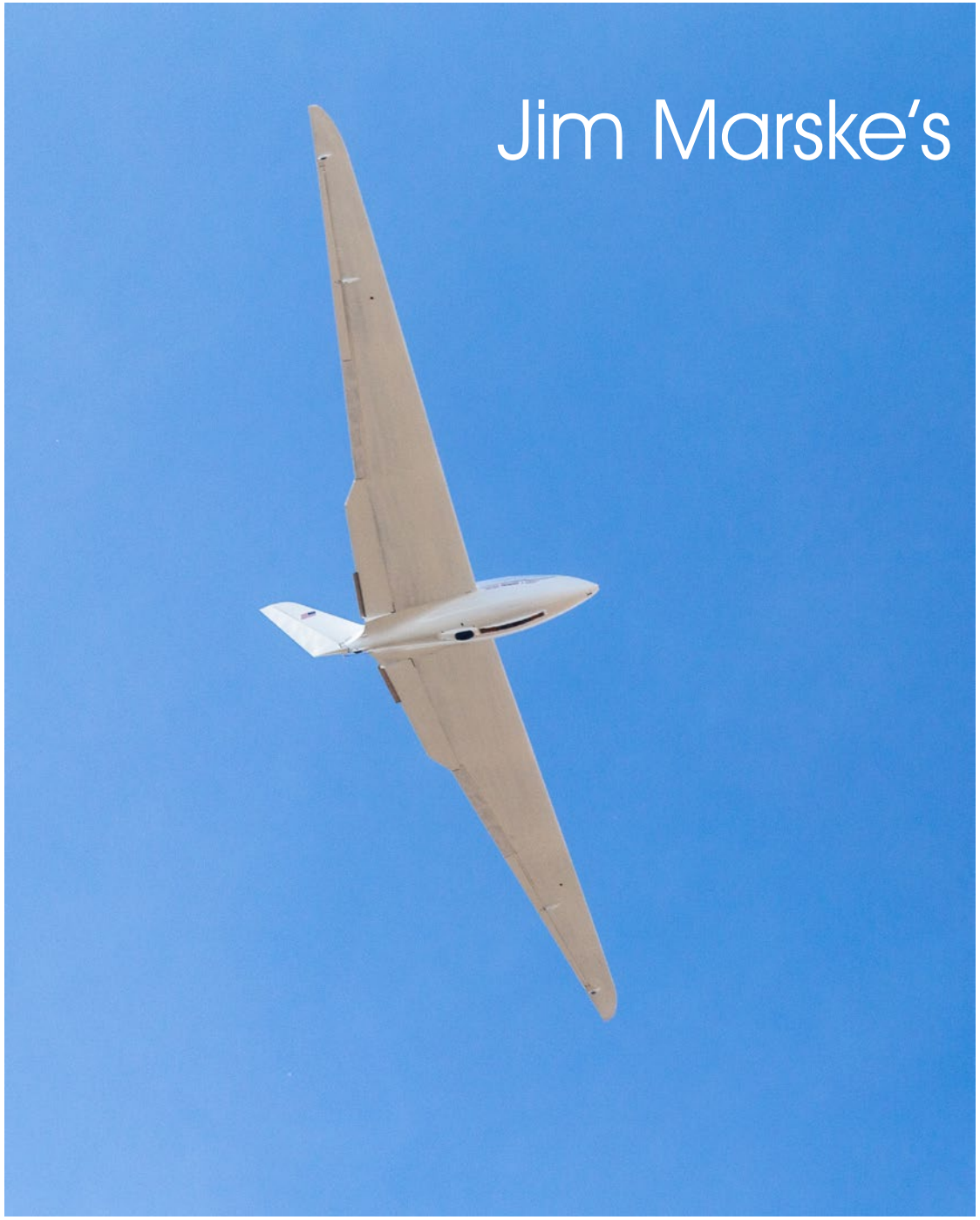
These are the last lines of an e-mail he sent me, and automatically translated by the PC:

"Seven years trying to set up the construction of a two-seater glider EL-2-M Šedý Vlk (Grey Wolf). As usual, at the beginning there is a lot of enthusiasm and then I find myself alone. I am now on a "Czech pension," this year I flew about 60 hours. I do not own the factory in town, just a place on the Ranà airfield (LKRA), which is not heated by the sun, so now I have to carry on Pauze."

Keep it up Jiri, when I come to visit you in Ranà I want to fly this glider !!!

Jiri Lenik and his work, the skeleton of the replica of the EL-2-M Šedý Vlk (Grey Wolf).

Lenticular on the Ranà hills.



Jim Marske's *Pioneer 3*

Jim Marske, jim@marskeaircraft.com

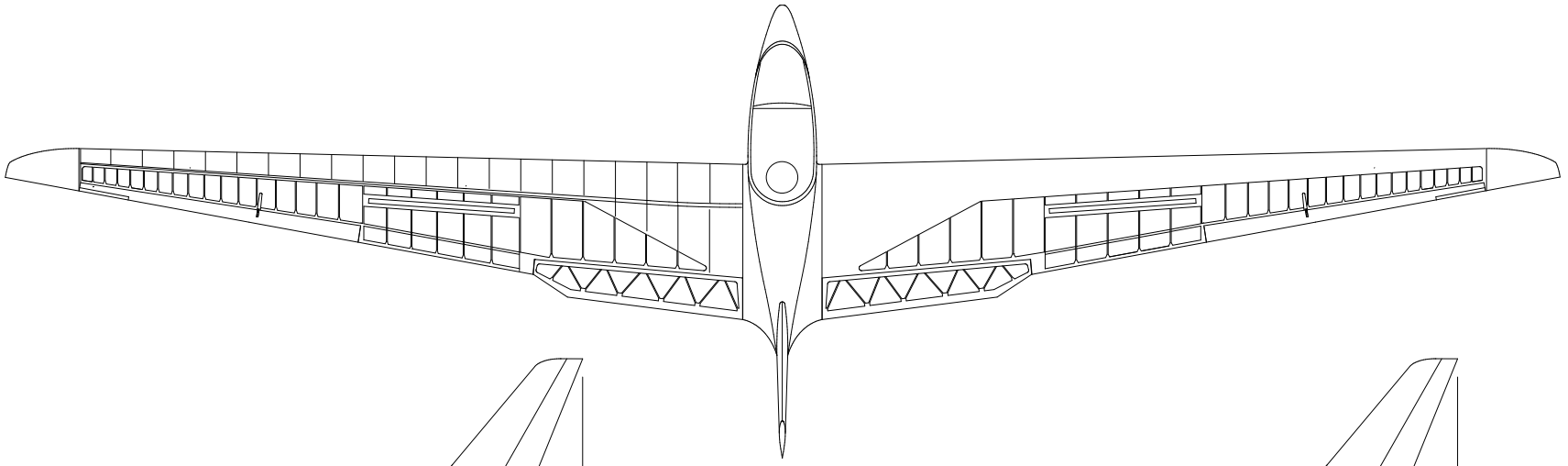
"Been busy with the Pioneer 3 and Pioneer 4. My Pioneer 3 is pretty well trimmed out now. I am amazed how a small air leak can make such a difference in performance.

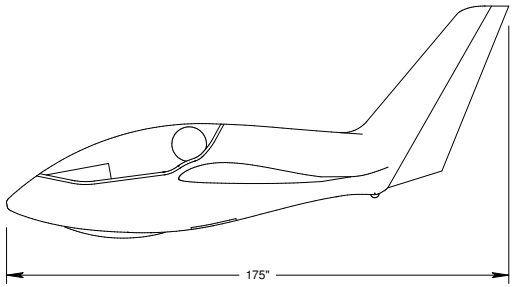
"We have two Pioneer 3's flying. I know that my Pioneer 3 is well over 40 to 1 but have not made any comparison flights.

"Mike flew his Pioneer 3a against a ASW-27 (46 to 1) at speeds varying from 42 to 75 kts with identical performance. Above 75 kts the -27 began to show improvemet but below 42 the -27 was stalling out. The Pioneer 3's minimum stalling speed was 35 kts. Wing loading of the Pioneer 3 was 4.5 psf against the -27 at 7 psf.

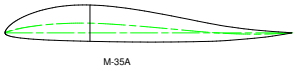
"Mike has not installed his CG shifter but high speed performance will improve once operable."

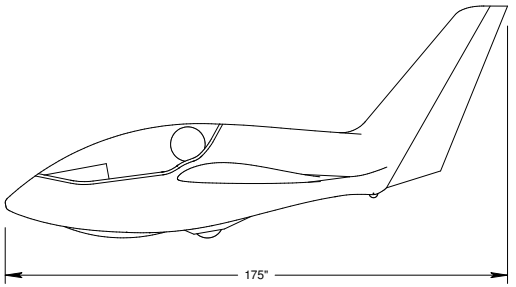
Jim's Pioneer 4 will be featured in the February 2017 edition of *RC Soaring Digest*.



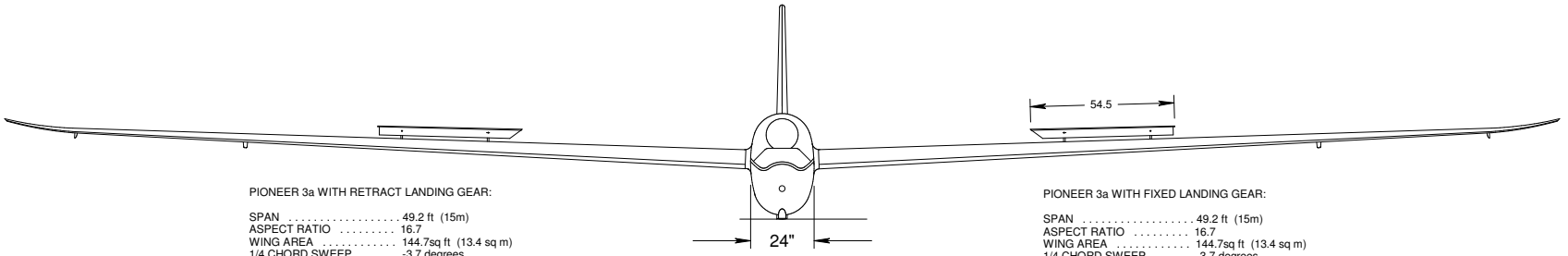


Retract Main Landing Wheel





Fixed Main Landing Wheel



PIONEER 3a WITH RETRACT LANDING GEAR:

SPAN . . . . . 49.2 ft (15m)
ASPECT RATIO 16.7
WING AREA . . . . . 144.7sq ft (13.4 sq m)
1/4 CHORD SWEEP . . . . . -3.7 degrees
AIRFOIL M-35a
EMPTY WEIGHT . . . . . 390 lbs (177 kg)
PILOT AND EQUIP . . . . . 260 lbs (118 kg)
FLYING WEIGHT . . . . . 650 lbs (295 kg)
WING LOADING . . . . . 4.5 psf (21.9 kg/sm)

PERFORMANCE AT 600 LB GROSS WEIGHT (4.2 psf)

SINK RATE . . . . . 100 fpm @ 44 mph (38kt)
0.51 mps @ 71 kph

GLIDE RATIO . . . 43 @ 61 mph (53kt) (99 kph)

PIONEER 3a WITH FIXED LANDING GEAR:

SPAN . . . . . 49.2 ft (15m)
ASPECT RATIO 16.7
WING AREA . . . . . 144.7sq ft (13.4 sq m)
1/4 CHORD SWEEP . . . . . -3.7 degrees
AIRFOIL M-35
EMPTY WEIGHT . . . . . 370 lbs (168 kg)
PILOT AND EQUIP . . . . . 260 lbs (118 kg)
FLYING WEIGHT . . . . . 630 lbs (286 kg)
WING LOADING . . . . . 4.3 psf (21 kg/sm)

PERFORMANCE AT 570 LB GROSS WEIGHT (4.0 psf)

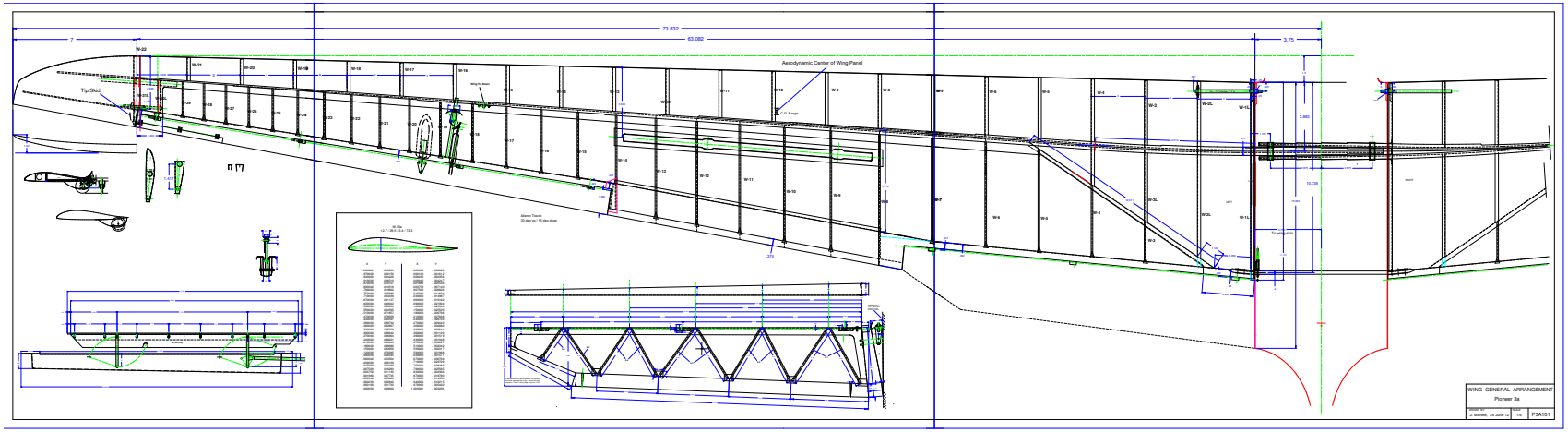
SINK RATE . . . . . 100 fpm @ 43 mph (37kt)
0.51 mps @ 70 kph

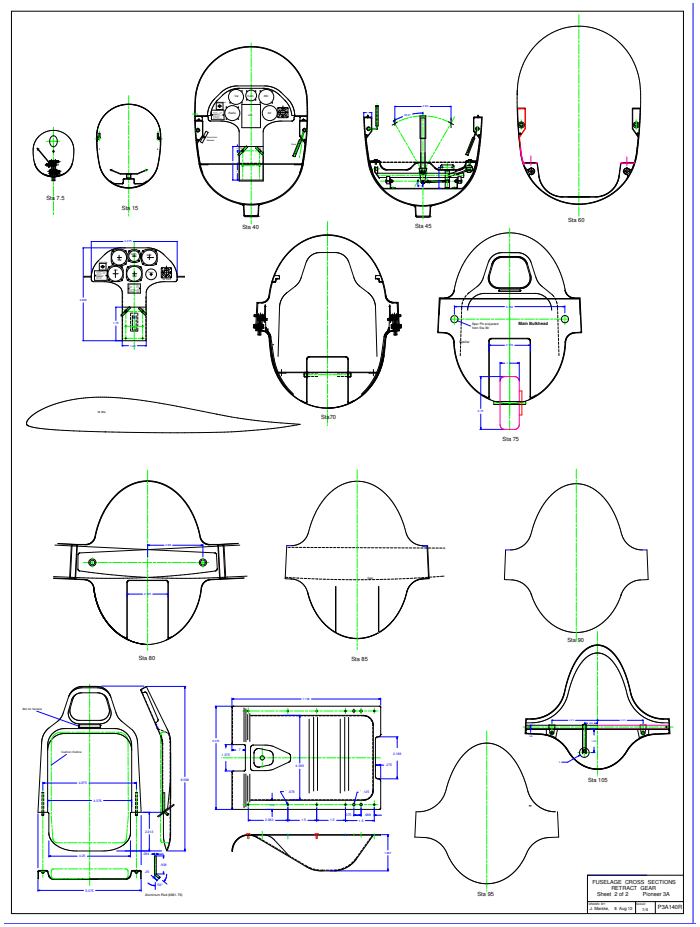
GLIDE RATIO . . . 41 @ 60 mph (52kt) (97 kph)

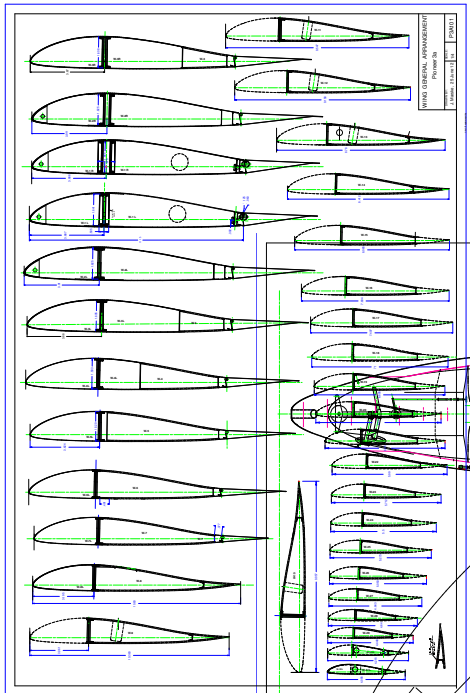
Jim MARSKE
975 Loire Valley Drive
Marion, Ohio 43302

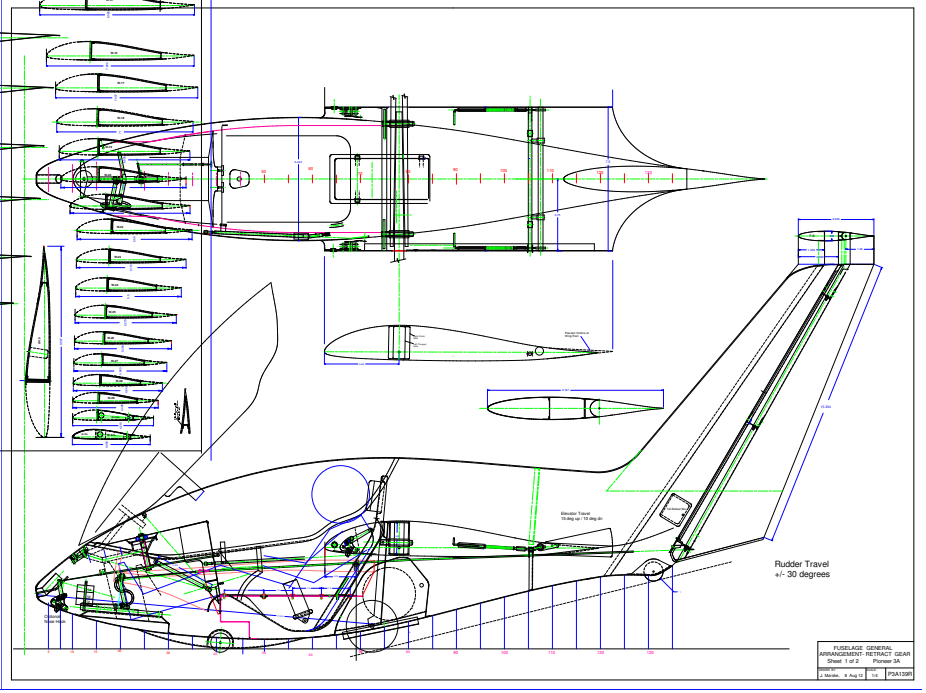
PIONEER 3a -15
TAILLESS SAILPLANE

DRAWN BY:	SCALE:	
J. Marske, 4 Feb 11	None	P3A100



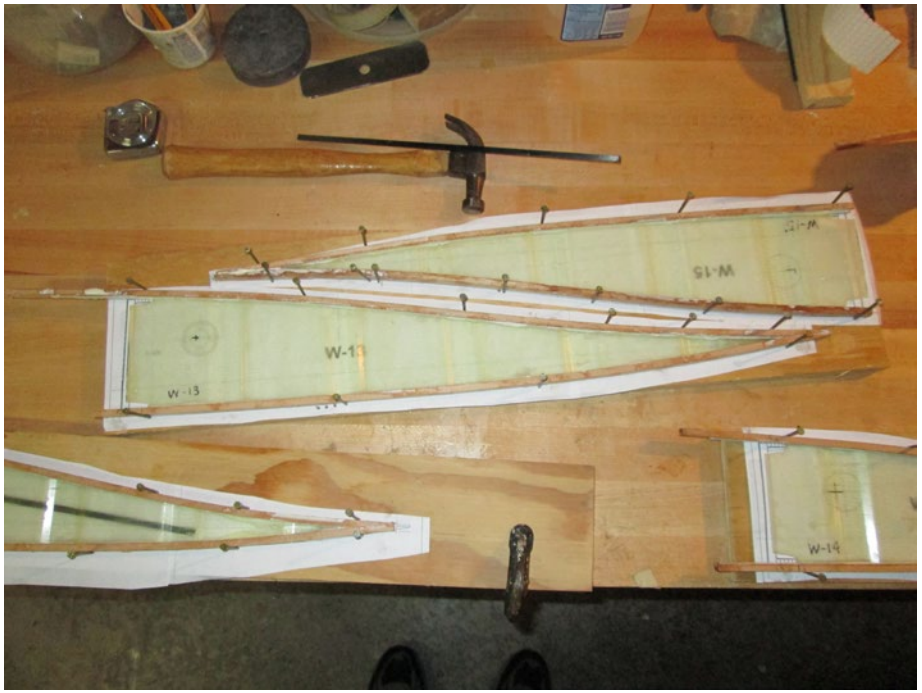






Pioneer 3 1:4 scale drawings

Original drawings in true 1:4 scale are available at
<http://www.rcsoaringdigest.com/Supplements/Marske_Pioneer_3_[PDF].zip>
<http://tinyurl.com/j6mpqjz>



The Pioneer 3 uses composite ribs and fabric covering. The main spar is also a composite structure using Graphlite Carbon Rod. <http://www.marskeaircraft.com/carbon-rod.html>

Above left: Ribs, already numbered, in the jig.

Above: Right aileron linkage.

Left: In this photo the left wing spoiler is activated. Notice the gap between the bottom of the spoiler and the upper surface of the wing.

Far left: The elevator guts, one side covered. Composite ribs create a truss which inhibits warping.

Left: Cockpit view with the canopy opened. The wheel on the left side of the cockpit is used to slide a weight fore and aft to adjust the CG in flight.

Below left: A better view of the cockpit left side and comfortable pilot cushion.

Below: Different Pioneer cockpit with canopy removed.

Above: Jim Marske and the completed Pioneer 3.

Left: The Pioneer 3 with canopy open and right wing removed. Note the wing mounts at the main spar, holes for pushrod connections, and the fence which aerodynamically separates the wing root from the elevator.

Opposite page: Jim Marske and his Pioneer 3 after another successful flight.


N41699
PIONEER 3

50th annual Cumberland Soar for Fun

Stéphane Ruelle, steffruelle@gmail.com

I come from the Alps, beating heart of slope soaring in Europe, and have moved 10 years ago to the Midwest, land of the winch and the aerotow.

When I first came to Cumberland Maryland in 2010, this place had a special meaning for me. For the first time on this continent I was able to fly slope in a place where your sight goes well over the next hill, giving you perspectives and the impression that you are the king of the world, or the king of the slope...

In essence I immediately felt home in a country that was not mine. Simple pleasures are usually the ones that have the most meaning for you, and coming to this place is definitively one that counts for me. Being able to join for the 50th anniversary is a pleasure, an honor and a perfect match for all the personalities you can meet at this peaceful place.

You always come to Cumberland with pleasure, uncertainties and fear. Pleasure as the memories you can make stay forever in your head; uncertainties as weather always prevails on the five day window (you usually have all kinds of weather, satisfying everyone), and fear as it is a mighty slope and as every mighty

Here is the pilot view when you are flying, very relaxing for your soul!

slope there is very little forgiving for any mistakes. For me it is a good summary of scale soaring as a constant risk assessment based on weather, giving you a great satisfaction and memories.

One of my great memories has been the abortion of tow just after take off, between a hundred and two hundred feet off the ground. There panic started to build as speed is low, altitude is low and risk is high! First taking a speed heading to the tree line to have a chance to do a safe landing, and lining up to a heading on the lowest point of the tree line in order to clear them and head for a landing. A couple of seconds pass and a wing suddenly lifts up on the way to the landing area, sufficient sign to give some courage to bank to one side or the other to test lift. And there, yes, it is a thermal 100 feet from the ground. I have worked hard to gain foot by foot my way to heaven. That flight lasted an hour and a half instead of the risky couple seconds it should have been. What a great souvenir of that place.

This 50th edition gave all of this and much more. Here are some pictures to share this spirit with you.

Above: A fleet of Ka8 foamies, just a fun plane to fly with low risk exposure.

Upper right: Aeromod MiraJ 2.5m sloper with an electro mod coming back from a 60mn flight in slope lift. Motor is convenient to get in the lift when it is far from the slope or to get out of a sink situation that leads you to fly under the horizon...
Right: The Philly team doing it list tuning on the new scratch built 100in Rotor.

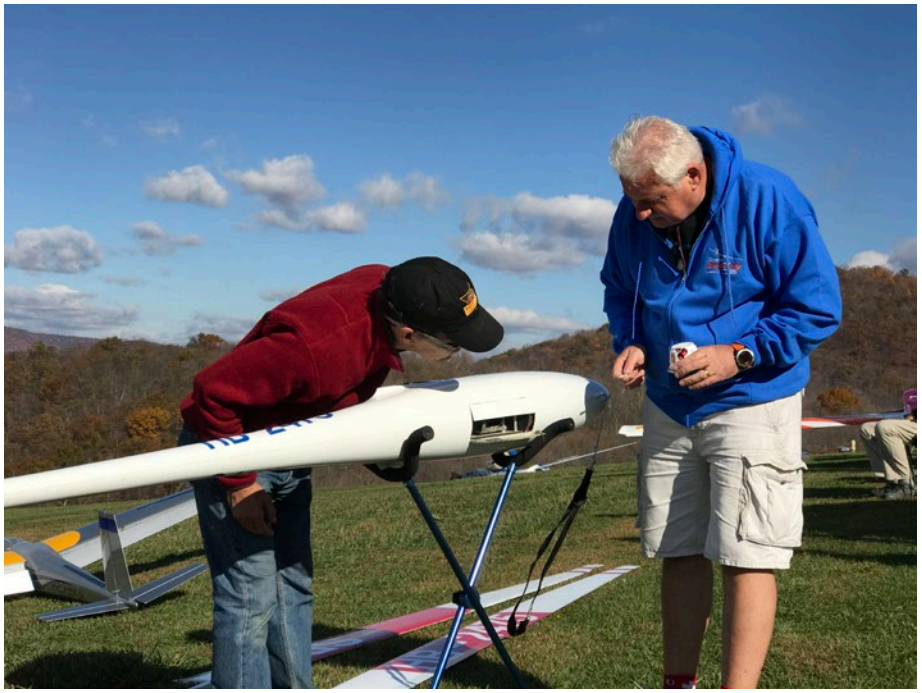
Upper left: Burt P. taking the pose just before one of his flights with his Hangar 9 ASW-20, a very popular sailplane.

Above: A Hangar 9 Pawnee upside down after an unfortunate landing. The east coast fixing crew is helping Kevin K. to be back in the air. Field repairs are always the best!

Left: Conio C. Ready for a tow with his E-Flite L-13 Blanik.

Left: Jeremy H. prepping up for a flight with his 6.6m Baudis Antares.
Below: A Hangar 9 ASW-20 just after take off.

Opposite page: Two quarter scale Aviation Concept 2-33 coming in on a simultaneous landing.



Above: Len, Scott soaring high.

Upper right: Fixing fixing, here is a landing gear door that needs field repairs.

Right: Scott and Matt on tow.

Left: Here is some of the pilot taking some good time in the air, in the background the clubhouse.

Below left: Topmodel Bildule 170, THE towplane on the east coast. This plane is a work horse and so pleasant to fly.

Below: Don C. Getting's custom painted E-Flite L-13 Blanik ready to be towed with.

Upper left: My 4.6m SZD 59, a revised version of the SZD-38 Jantar.

Above: Here is a weathered version of the radian XL, after spending four months in the woods it flew again... Just indestructible...

Left: Here is an Hempel Cub getting ready to tow on the mountain.

Above: Steve P. waiting in the line to take a tow with his Baudis Antares.

Left upper and left: The I-OKAY Hangar 9 ASW-20 with some custom made winglets.

Opposite page: One third scale 2-33 from Aviation Concept coming in for a landing

Above: Steve P. and Len B. offering a sign for the club house to the field owner, Jim D.

Above right: Kevin K. with his Hangar-9 Pawnee back in one piece

Right: Scott coming back from a pleasant flight with his Baudis Antares.

Above: Eric S. SG38, one of the early fliers.

Above right: Vladimir H. That came from Chicago with his Hangar 9 ASW-20.

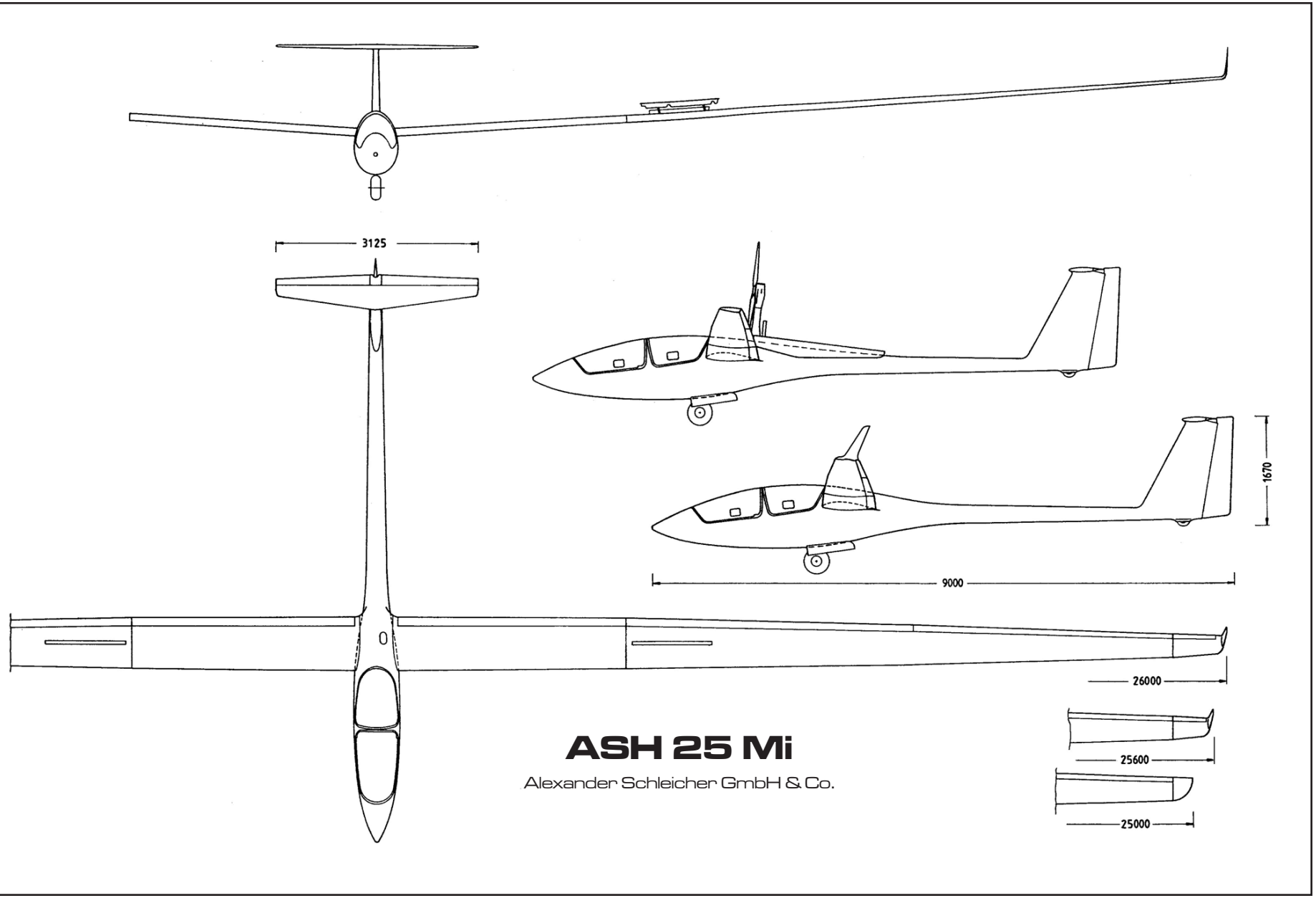
Right: Not only the foam Ka8 came for a group picture, the Hangar-9 ASW-20 too... (Did I say that this plane was popular?)

Above: Tom P. going to the line with his Phoenix Model 6m Ka8. (The spar has been fixed on this one by the owner.)

Above right: Another shot of the Hangar-9 ASW-20 group.

Right: Burt P. getting back in the line with an EMS 4.8m Ventus.

Above and opposite: Pete A. getting ready for a memorable flight at sunset. He helped me take some awesome pictures.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Alexander Schleicher GmbH & Co.

What is a good fuselage length for F5J?

Marc Pujol, marc.pujol340@gmail.com

Contents

Introduction

Let's compare "Perfection's Genoma" and Pike Perfection.

• Performance in straight line and during circling.

• Dynamic Performance

Short fuselage or long fuselage in a complete flight

Short or long fuselage over an entire season

Conclusion on the right length of the fuselage

The right size of the fin

Introduction

Since 2011, I made several articles on yawing stability (2011-11) and F5J planes (2012-11, 2012-11, 2013-11, 2014-04). In such articles, we have seen the need not only to focus on pure performance but also to improve the overall dynamic behaviour of our models. This led us to look in particular to:

• The pitch stability that is linked to the position of the center of gravity (the famous CG).

• The lateral stability that is so important for the detection of thermals and for easy thermalling.

We also saw that three parameters are important for yaw stability:

1. The inertia of the wings, this needs to be as low as possible.

2. The surface area of the tail.

3. The rear lever arm of the tail.

A long fuselage and large tail surfaces lead to a more accurate and faster yawing/turning response.

But a long fuselage also has some drawbacks. It limits the plane's ability to show small thermals. The plane remains on its axis and yaw oscillations due to turbulences are shorter and smaller.

After three years of using a Genoma² plane in competition, my machine had many scratches and repairs. I haven't finished the molds for a new wing but then had the opportunity to play for the 2016 season with a Pike Perfection, that is to say to play with a glider that has a short lever arm and a relatively small fin surface. In short, a machine that is the opposite of the Genoma².

After some initial flights, both promising and disappointing and with the advice of other competitors (many thanks to Jacques), I was able to find better settings and to achieve my best results in a F5J competition.

Good results with a new and unknown plane which is the opposite of what should be a good plane, is like saying that the bumblebee should not fly! But as it doesn't know this, he continues to fly!

Those results appear to me as something that shakes all my certainties. In any case, intellectual honesty forces me to look at things from other angles, and to understand why the real differences in behavior between the two machines does not translate into significant differences in competition.

Perfection against Genoma²: A fight in perspective?

The goal here is to have a better understanding of the influences of fuselage length and fin surface and to separate what is the pilot domain and what comes from the plane itself.

I first tried an adaptation of the Perfection (Photo 1) wing to the Genoma² (Photo 2) fuselage.

How to adjust a wing on the fuselage! (Photos 3 and 4) It's pretty simple! It is a matter of reproduction. And as in the animal and plant kingdom, all are not compatible with all. But when nature allows it, the result of such hybridization is obtained after a suitable gestation period.

Then I had to find the right setup for the new model. Since it is neither a Genoma² nor a Pike Perfection, I had to mix things. I started with the wing deflection setup of the Pike Perfection and the fin and tail setup of the Genoma². Unfortunately, this was not a good idea. After several flights, I had to go back to the Genoma² aileron and flaps setup in order to be satisfied with the flight.

If you think about it, then you may say that this is "obvious." Differential on aileron and flaps are managed in order to correct potential low yaw behaviour. Since this is done by the fuselage


3


4

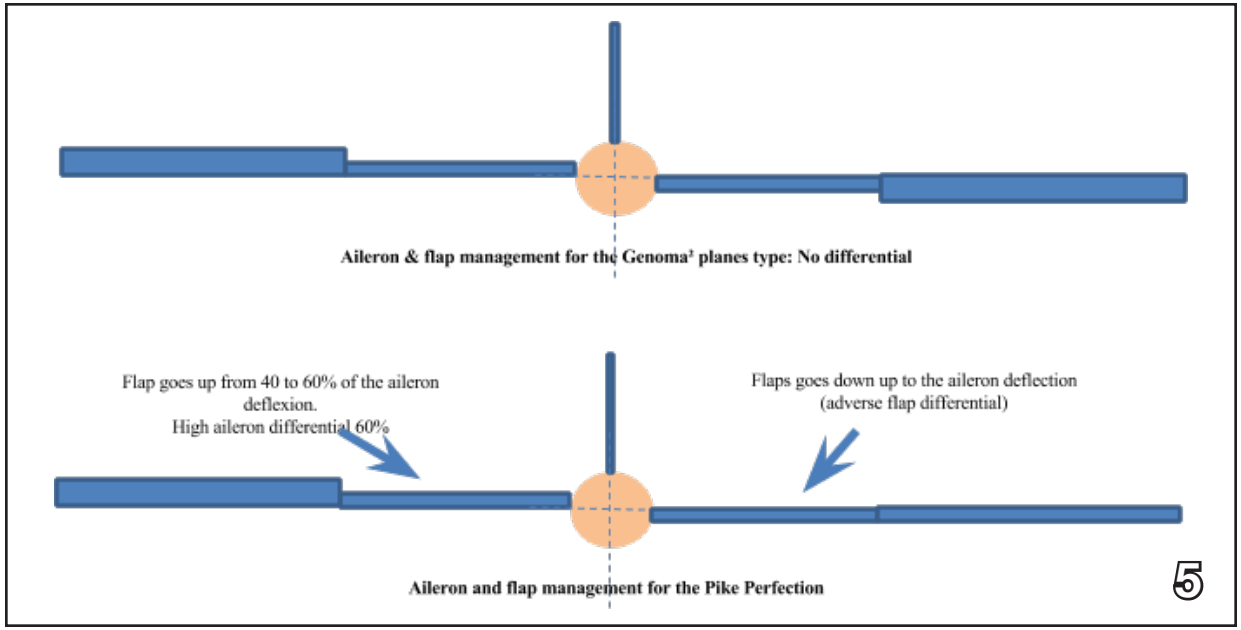
and fin, the aileron and flaps settings are mostly influenced by them. Long fuselage and big fin require small or no aileron differential!

The final settings retained are then very close to the Genoma² ones which are:

- No more aileron differential
- No more adverse differential to the flaps

(Illustration 5)

I then modeled the two machines with XFLR5 software and watched the performance of the two machines in my possession.



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Finally, I made several flying sessions in very light conditions this summer in order to better understand how to fly them.

Those sessions were very instructive and I made lots of progress in such light weather.

For example, I remember that I spent 10 min in a very light thermal to gain only 100m. The planes climbed only if the aileron and rudder were correctly managed. Too much of one of them and it doesn't climb. Too little and it turns out of the thermal ! Very good exercise to improve my flying style — we always have very bad habits.

I then had a better understanding of how to manage the two planes. I had to put it in words. Not so easy! After shaking all such experiences in an accurate shaker for several nights of dreams and updating my thoughts when brushing my teeth in front of the mirror early in the morning (this is where it best decants), I had some ideas about the bumblebee and such kinds of flying objects and the best way to send them to heaven.

Let's compare «Perfection's Genoma» and Pike Perfection

Performance in straight line and during circling.

In a straight line, both planes show very similar performance (Illustration 6) Perfection of Genoma (green olive curves) has a bigger fin and a slightly smaller stabilizer compared to the Perfection (The total fin + horizontal tail surfaces of the perfection is 2 dm^2 less than the Genoma[2].) But Finally, the Perfection is very, very similar to the Perfection's Genoma. Not enough to make a real and actual difference, quite the contrary. True equality! That's all good!

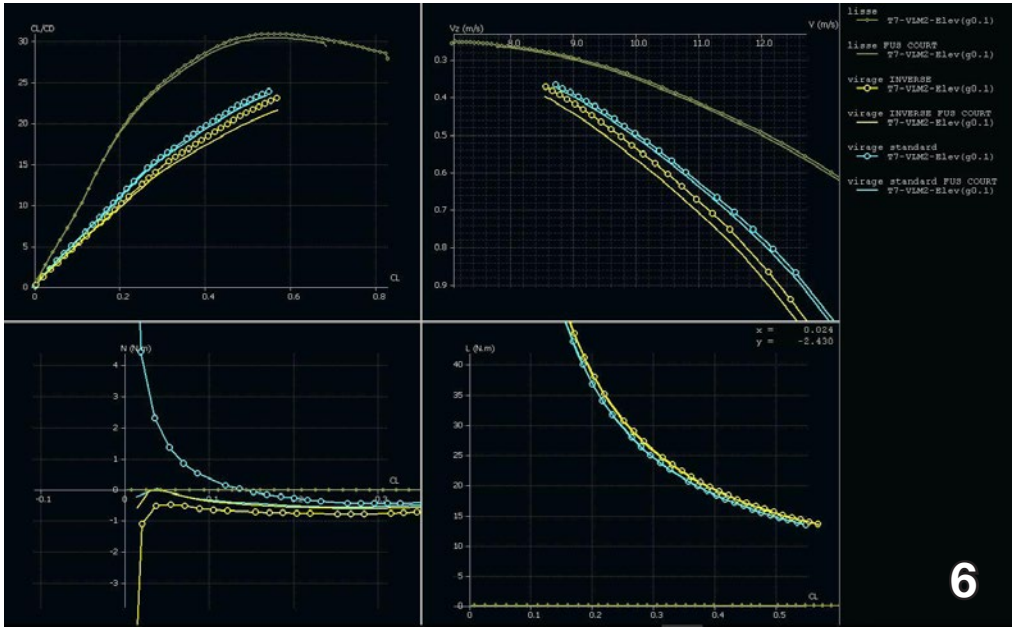


Illustration 6: Performance curves according to XFLR5. The results spewed by the computer are quite in line with what we can observe.

Let's go now for circling.

To model circling, I had to take into account the rudder deflection in order to correct adverse yaw.

Curiously, it took very little rudder (on the order of 2 to 3 degrees) to correct it. You should know that XFLR5 models straight flight and not circling. This is very important to know because it may only represent a turn at low bank angle and with wide radius. Flights made at eye level on our field one evening (a sort of air carrier that "sails" 10 m over the corn fields) where restitution allowed a small slope soaring 5 m from the ground, confirmed these low deflection values for such a large flat turn.

When the plane is turning, the XFLR5 curves tell us that the reverse differential set on the flaps provides a torque surplus by increasing drag of the down flap. It therefore destroys the gliding ratio and is therefore not a very efficient way to fly.

Well, we knew it!

One can even notice that this is not a “ridiculous” performance reduction. In our standard F5J flying speed, aileron and flap deflection represent from 5 to 10 cm/s performance reduction compared to the straight flight. This shows us that when a pilot uses ailerons, the plane performance is affected.

The drag created by aileron movement is greater than a similar movement of the rudder. It then appears to us that turning with the rudder may be better than turning with ailerons.

Moreover, when circling, do not use too much rudder movement as this will require aileron movement in the opposite direction. If this happen, reduce the rudder movement in order to also reduce (and even stop any) aileron movement.

A good turn is made when the minimum movement is made on the sticks (then minimum yaw and aileron movement).

Use rudder, yes! But with the right amount! Neither too little nor too much!

Too much and you need additional aileron to counteract the rudder movement. Too little and it doesn’t turn enough. We must therefore use all the control surfaces (rudder, aileron, etc.) only when required at the right amount!

Now let’s compare the two models together (short or long fuselage) at iso aileron and flaps efficiency.

Once again the differences are not huge at all. It is only a matter of a few mm/s. In any case, not enough to make a real difference. This therefore reflects the fact that the pure performance differences between a long and a short fuselage shows a very small advantage to the long fuselages (under the assumption that the drag of a very narrow fuselage does not increase as its length is increased). And if there is some differences in flight, and be sure that there is some, this could not be handled with the standard and static performance curves provided by our standard software.

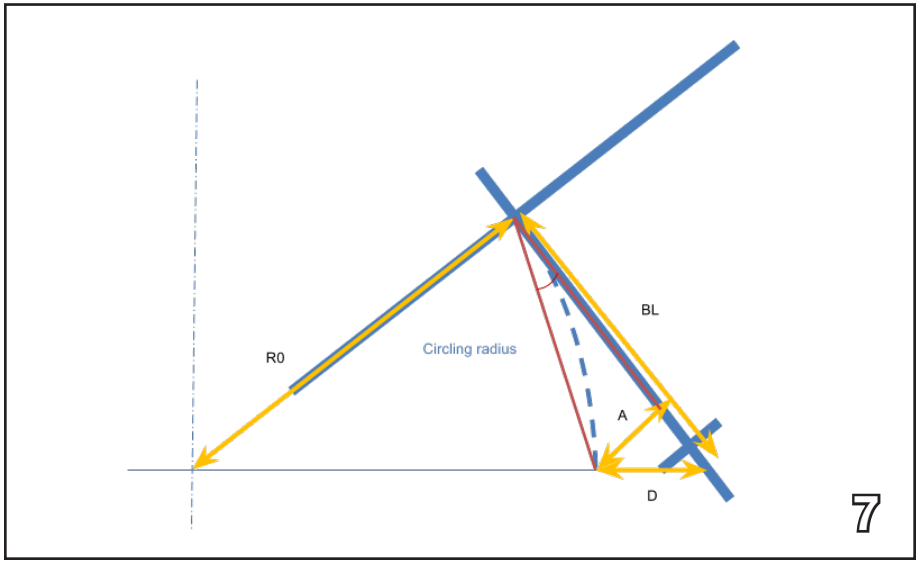
So our models in straight flight are not everything. What makes it all is the way we play with them.

In summary, already avoid touching the controls unless you want circling.

We should repeat it! An effective flight always results in the absence of stick movement or small and slow movement..

These first calculations also allow for further comments:

• The low rudder deflection needed to combat adverse yaw is a good thing. It allows one to use the remaining possible deflection to compensate for the shift of the fuselage outside the circling radius. (Illustration 7)



7

• It also allows us to increase the slippage of the model if required. A way to trap the glider nose position slightly inside the turn! The model is then more stable. And indeed, in flight, the spiral is easier. But the flight is less efficient because more slippage means more drag and therefore more sinking rate. And in a very light thermal, this may lead to climb or to sink! Too much rudder movement (which translates to a fuselage drift in a magnitude of +5°) will easily generate 3 to 5 cm/s additional sinking rate (thanks to XFLR5). And this is exactly the values I found during my last summer flight experiences!

• The yaw torque generated by turbulence or by the adverse yaw is very low. This is in the order of 1 to 2 Nm for a few degrees of yaw drift. Any rudder mounted on any fuselage will then succeed to generate such torque. In other words, all models with a body and a rudder will fly correctly and straight in stable air. The differences between short or long fuselage planes does not come from their ability to generate torque or to fly straight in dead air. They come from the dynamic behavior of the model — that is to say, the way they react to a stick movement or turbulence. The difference is then in dynamic behaviour.

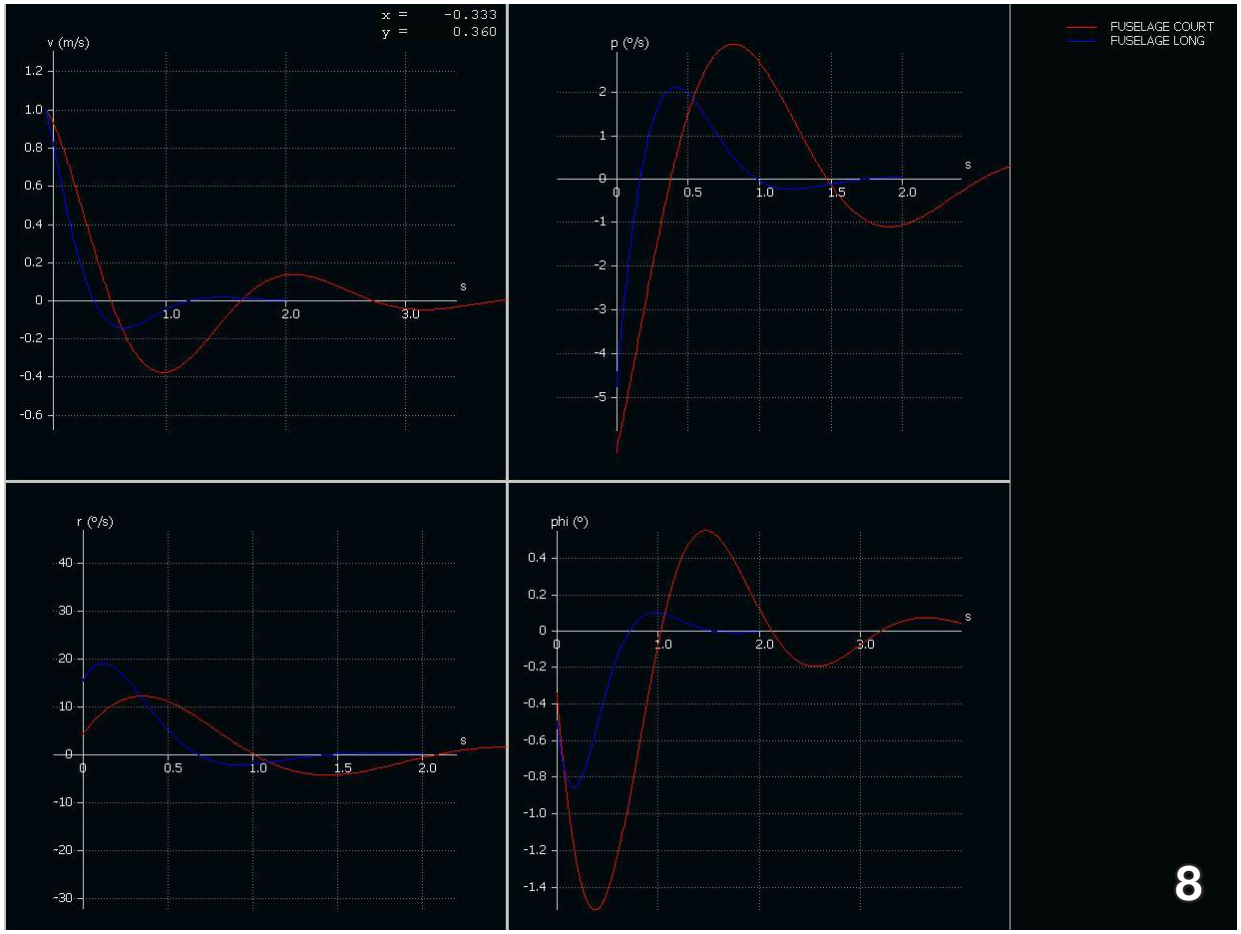


Illustration 8. Dynamics of the two machines. It is obvious to say that Pike Perfection and Perfection Genoma are different planes.

Dynamic Performance

The curves showing the dynamics of the model (Illustration 8) and in particular the one on the yaw axis gives us a first answer to our question:

The Perfection Genoma responds to the inputs of its pilot in 0.5 seconds while the Pike Perfection responds in 1 second. This is a real and big difference. One is nearly a DLG, the other is really sensitive to turbulence but is more like soap on a plank.

Even with these results, we must not declare victory too soon. The strong difference in stability between the two models does not explain why the bumblebee flies.

It is possible to react quickly with the long fuselage, which is interesting in a narrow thermal.

With a short fuselage plane, you have to be gentle on the sticks There is no reaction to quick movement of the rudder because it doesn't react as fast (if you do so, this will only slow the model!)).

The long fuselage may then be very interesting (promising?) (it can act accurately). But it also may be a drawback if we tend to move the sticks too much. Any movement on the stick means drag. It may appear interesting to the pilot to make lots of adjustments, but the consequence of this is slowing down the plane and creating a greater sink rate. You think you improve the flight, but in reality you generate more drawback (Drag) than improvement (positive altitude).

In the same way, with a short fuselage, we may give too much input on the stick in order for the plane to react. Or to put the plane nose down when circling with the consequence of too much movement of the ailerons. This will also reduce the circling performance.

Thus, regardless of the machine, with a short or long fuselage, we must move the sticks when needed and only when needed, with the right mix on the sticks.

The performance of a flight is not only in the ability of the machine to respond; this is only part of the problem. This is primarily a story of skill. Never forget that 70% of the result belong to the pilot!

Observe how you fly your plane and you will see that you make too many control inputs! In short, the performance of the flight is primarily determined by the performance of the pilot before being linked to the intrinsic performance of the machine.

Comparing models objectively may quickly become very complicated...

Short fuselage or long fuselage in a complete flight

Now that we have seen the differences and limitations of each configuration, we can look to a "standard summer flight" and the difference that can exist between a short and a long fuselage.

Such standard summer flight may be split into four phases:

- Two minutes of searching for a thermal (of course, in F5J, it has to be shorter than that).
- Then, four minutes of climbing in thermal,
- Two minutes to return from downwind
- Two minutes to prepare landing and to land.

During the thermal search phase, the idea is minimize movement of the sticks in order to better feel the air. Thus, the difference between the two models is very narrow. Something about 2m at the end of 2 minutes (long fuselage advantage). This has far less consequences than the wrong placement in bad air.

This is also the same when the plane returns to the field with the same small advantage to the long fuselage.

During the landing phase, the difference in performance is also not an important topic. So no differences.

Then the only remaining potentially important phase to separate the short and long fuselage is the circling phase. And the difference here may reach up to +30m with once again the advantage to the long fuselage (let's say a gain of 5% to 15%). That means less time in the thermal which also means :

- not going as far downwind. In our case this can be up to 80m.
- or escaping more easily from the more difficult zone of the thermal (at low altitude).

It is then when the planes circle that you may find the difference between long and short fuselage. A long fuselage may have the advantage over a short one only if they encounter thermals that require them to circle. And such advantage is higher when thermals are narrow.

Short or long fuselage over an entire season

Now that we have seen the differences in static and in dynamic mode on performance and on a "standard summer flight," we also have to estimate the consequences over a full season.

This will give a better indication of when the long fuselage is interesting and when it is not.

First, we must admit that the thermal force is fairly neutral to our problem. In the thermal, if it is a regular one, the vertical speed of the air does not affect the need on any yaw stability. But the size of the thermal (its diameter) and the air turbulence (go in or out of a thermal can also have the same meaning of "turbulence)."

Type of condition	Pro Factor	Cons factor	Explanation
Large Thermal Transition	Long fuselage Small fin	Big fin	Drag optimisation
Narrow thermal	Long fuselage Big fin	Short fuselage Small fin	Maneuverability optimisation
Light turbulence	Short fuselage Small fin	Big fin	Thermal detection optimisation Drag optimisation
Strong turbulence	Long fuselage Big fin	Short fuselage Small fin	Stability optimisation. Caution not to over pilot !

Two optimisation appear:

- Limit the drag. Here, you need a long fuselage and a small fin,
- Improve handling. Again a long fuselage is mandatory. But here we need a big fin.

So we need to find a compromise between two conflicting parameters. How to define it?

Well by analyzing the type of competition that occurs over a year. Here, we must say that it depends upon each competitor, the place of competitions and their dates. It may even be

useful to optimize the plane for a given event (e.g.: a World Championship). This can vary from one to the other and the answer can not be unique. It's up to you to settle your own need.

For example, let's consider an average season of 22 competitions with a few more during the summer period in western Europe (France, oceanic weather):

Month	Number of competition per month	Drag weight factor	Maneuverability weight factor	Comment
January	1	5	1	light thermals Motor shut down around 200m
February	1	5	1	
March	1	4	2	
April	2	4	2	Thermals Motor shut down between 100 / 150m or even more
May	3	3	3	
June	3	1	4	Thermals EMotor shut down at low altitude
July	2	1	5	
August	2	1	5	
September	3	3	3	Thermals Motor shut down between 100 / 150m or even more
October	2	4	2	
November	1	5	1	light thermals Motor shut down around 200m
December	1	5	1	
Total	22	65	74	Slight advantage on maneuverability

If someone participates in competitions regularly throughout the year, a plane that is a sort of average plane is what you need. If you mainly fly during the summer, let's favor maneuverability.

In summer, take a handy and lightweight machine (long fuselage and large fin), and during cold periods, take a machine that has very low drag (long fuselage and small fin). And if you fly all the year, take an "average" machine (long fuselage and reasonable fin surface).

Conclusion on the right length of the fuselage

A long fuselage is good. A large fin can have added value providing:

- You need to know how to interpret any signs given by the plane (i.e.; detect thermals and turbulence).
- Give just the required input for the proper plane movements (in angle and speed movement of the rudder).

• Do not over-pilot the plane (give input when necessary).

And it is these three parameters which are the first and most important things and which make the real difference in the results. We return to “70%>” of the pilot and “<30%” of the plane.

Finally, a plane “stiff“ in yaw, which also means very “handy,“ is something that provides a small “plus“ to take the lift at very low altitude where you should not miss it. When the plane is close to the ground, things change very quickly. The air is not stable and the thermal is not well established. It is better to escape up as quickly as possible.

So how long does the fuselage need to be? Here we must include other factors such as transportability, the space needed in the workshop...

And it is clear that the maximum is generally about 2.4m and that transporting a box of 2.1m or longer is difficult to find or to use for air traveling.

So, the place to store a plane that is more than 2.5m long and which is 4m span is not necessarily obvious. So we have to go to the plane where the aerodynamic factors have to be mitigated with other ones such as those. We must make compromises. A 2.5m long fuselage is *a priori* a maximum providing that it can be separated into two parts behind the wing. This allows for a case of about 1.3 to 1.6 m long if the wing is three or four parts. Travelling, even by air, becomes easier especially when the fin is also removable.

A ratio “Fuselage length / ½ Wingspan“ is equal to 1.25 is then something that meets all such criteria.

The right size of the fin

Now that we have a direction where to go referring the length of the fuselage, we need to talk about size of the fin.

From the data of the other articles on lateral stability, it can be shown that the glider travels a distance “D“ before returning to a straight flight. This distance is independent to the flight speed. By the usual approximations, “D“ may be given by:

$$D = k * \frac{Iz}{SL^2} = k' * \frac{Sa * Env^2}{S * L^2}$$

With “Iz” the inertia of the wing on the yaw axis, “S” the surface of the fin, “Sa” the wing surface, “Env” the wing span, “k” and “K’” are constants and “L” the rear lever arm of the fin. Note that K contains the wing density (mass per unit volume). At the same construction technology we can take this as a constant. But if you change the construction method, for example if you compare a hollow wing with a full Rohacell (foam core) wing covered with carbon, then you must extract this factor from the constant and take it as a variable.

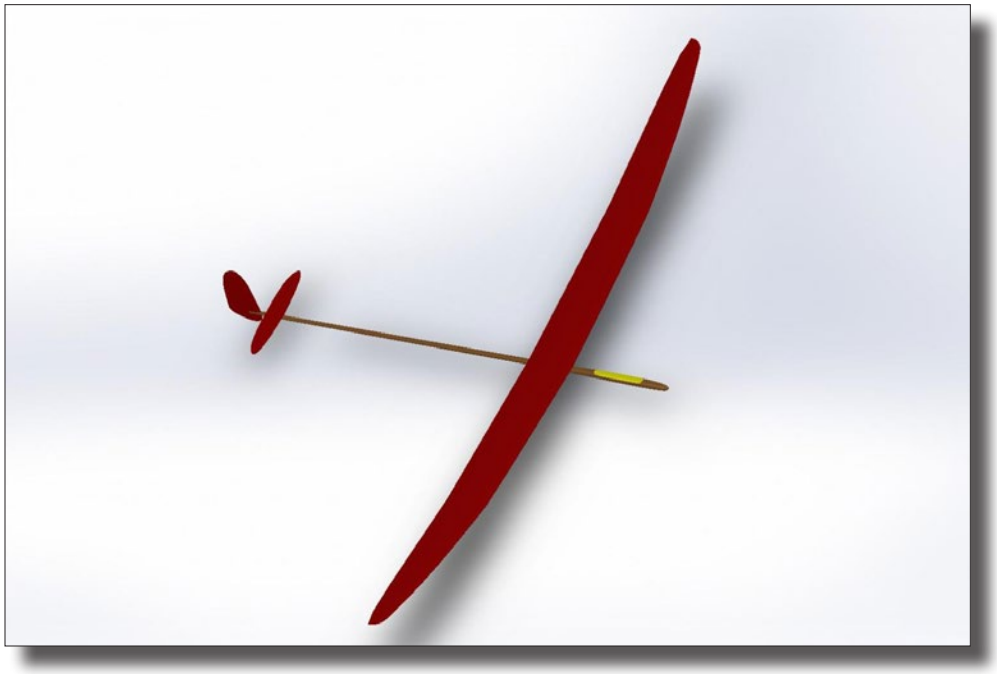
The distance “D” formula we have here is a little bit different from the standard stabilizer volume factor we used for decades. There are “squares” that are applied to the distances. And that makes all the difference...

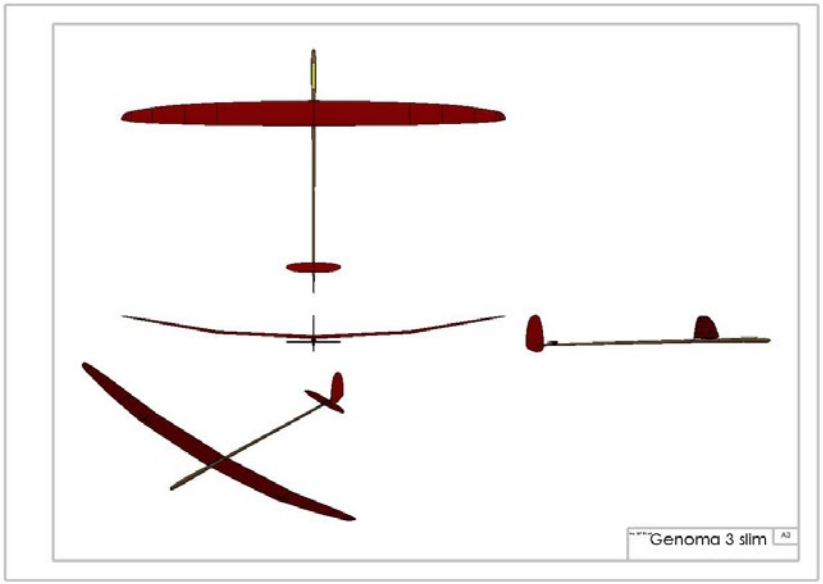
Let’s stop for a minute on this formula: It reveals that a 4m wingspan plane or a 1.5m HLG can behave the same way, if they have the same “surfaces” (wing and fin) and “distance” (size and rear lever arm) proportions. And those who fly the two planes found some similarities between them.

Returning to our fin surface problem. The formula “D” shows us that we can have a proportion rule between wing and fin surfaces. It is therefore justified to speak percentage of the wing surface to define the fin area.

How to find the right value ? Here, for once, I will look at existing planes. But you can also start from the theory.

A Perfection is in my opinion the minimum to have (the fin represents 5%





of the wing surface). Remind that the lever arm is “short,” so that D is of the order of 50m.

A Genoma² (or perfection of Genoma) has an 8% fin surface. This gives me the upper limit.

A Genoma3 fin, with its elongated fuselage to reach 1.25 times the half-wing-span (4m) will have 5% of the wing surface, and will be slightly less stiff than the Genoma². Quite acceptable however! The stiffness of a Genoma² for less drag than the Perfection (smaller stabilizer)!

Conclusion: Take a fin area of about 5 to 8% of the wing surface. 5% for a long fuselage and 8% for a shorter fuselage, and you will have a “stiff” machine for F5J.

You can follow the Genoma project on RCgroup: <https://www.rcgroups.com/forums/showthread.php?t=2637104>

And on F3news (In French):

<http://www.f3news.fr/t5416-genoma-2012>

<http://www.f3news.fr/t8592-le-genoma2-2014>

Pitch stability vs AR for tailless aircraft

Marko Stamenovic, ftlltf@yahoo.com, via FaceBook

Here is graph showing pitch stability expressed as dCm/dAoA in dependence of AR.

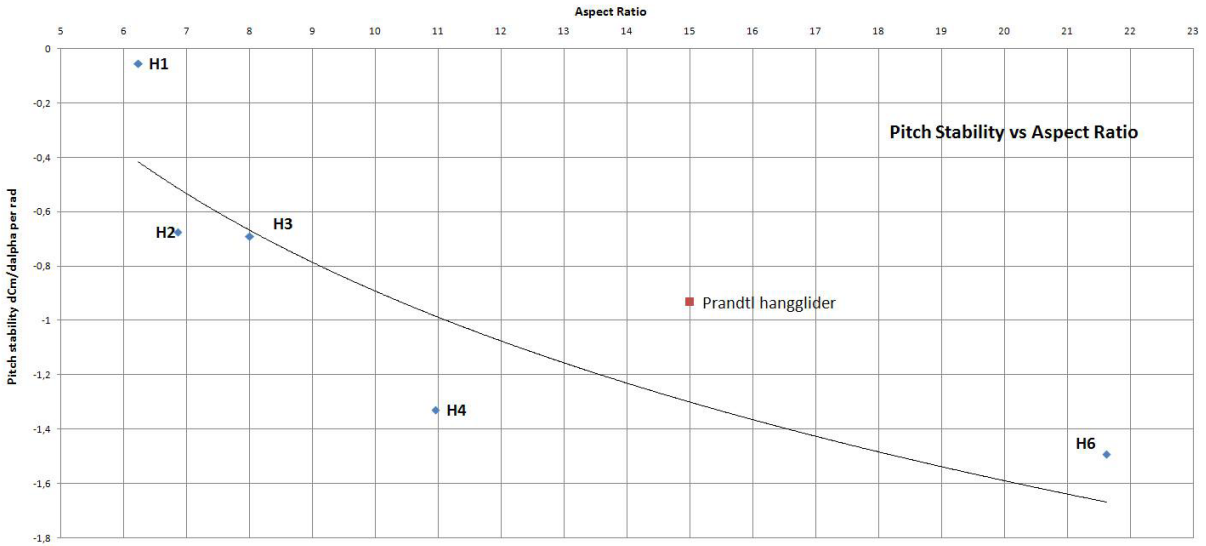
Values used in calculations for Horten's designs are from Karl Nickel's book. With some assumptions here are the results. Also, Prandtl hang-glider is included to see how it fits.

Calculations are done using data Al (Bowers) shared with us. It is notable that there is tendency of increased stability (more negative value) with higher AR. Question is why.

My logic goes for this: BSLD requires considerable twist, the higher AR is the higher is resulting pitching moment. In order to have aircraft trimmed for level flight without considerable elevon down deflection CG needs to be quite forward. Otherwise airplane would strongly pitch up (even maybe loop) and would be hard to bring nose down.

This may look like instability but might be actually a trim problem. Other designs fit well in this trend, for example calculated values for PUL-10 (with AR of 6.48) give much lower static pitch stability values.

Just for reference dCm/dAoA for Cessna 182 is -0.65. Btw, I am strong proponent of using dCm/dAoA as a measure of stability.



DFS Rhönbussard

German glider of 1932

Text by Elia Passerini, eliapasserini@valdelsa.net
Photos by Elia Passerini and Paolo Ganozzi
Translated by Mrs Anne Catherine Vassallo

The DFS Rhönbussard is one of the many gliders designed by German engineer Hans Jacobs (1907-1994) who was, in the early 30's, at the head of Deutsche Forschungsanstalt für Segelflug, in Darmstadt, succeeding Alexander Lippisch.

His other very interesting projects include the DFS Habicht, the DFS Kranich, the DFS Rhönsperber and the DFS 230.

In 1932 Hans Jacobs, after the great success with his first project, the Rhönadler with a wingspan of 18 meters, created the Rhönbussard which was built at the Schleicher factory in Poppenausen on the slopes of the Wasserkuppe, the same company that still builds beautiful gliders today. To name a few: ASW 28, ASG32 I and ASH 30 Mi.

The project of the Rhönbussard rose from the need to train new pilots at the flying school including the National Socialist Flyers Corps (NSFK) with an intermediate level of difficulty for flying from the simple Grunau Baby and more advanced models such as the DFS Rhönadler.

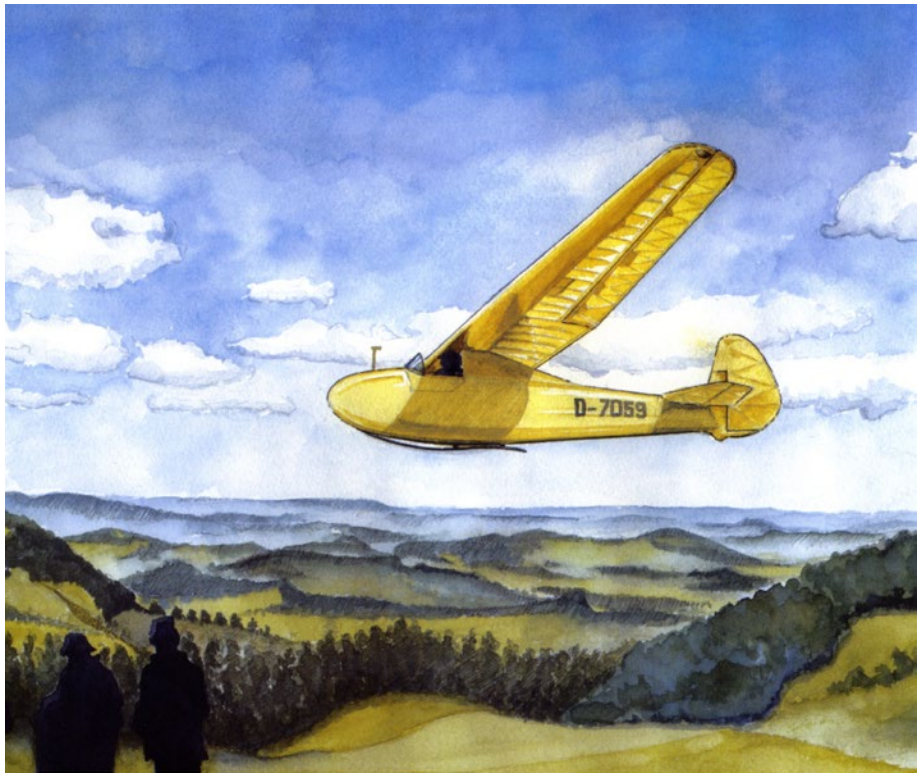
The model was such a big commercial success that during the thirties well over 200 gliders were produced at Schleicher. The Rhönbussard has a wingspan of 14.30 meters with a wooden frame covered with plywood and canvas; the classical setting is of the Hannover H 1 Vampire, remained almost unchanged since 1921: single-seater open cockpit and high wing.

The fuselage is very short, 5.80 meters, egg-shaped, tapered towards the tail with wooden frames and covered with plywood boards; the single-seater passenger compartment is reached by removing a cover that integrates the windshield. The rear ends with a single-fin fletching with quite a large vertical element on a horizontal plane placed in an advanced position.

Even the wings are rectangular wooden structures in the central part and tapered towards the external and they are made in two parts around a strong central longeron to which the light ribs are glued. The whole structure is covered in canvas except on the leading edge, which is also covered with plywood. The wing with root profile Go 535 ends with Go 405, and is positioned high above the fuselage, with a cantilever connection and partially protruding above the pilot's head: this is to find the right center of gravity. This limits the upward visibility, especially important in thermal spirals.

It has got two mechanically operated ailerons. The landing structures are a simple front slide and a second, smaller one, positioned under the tail, both provided with elastic elements able to absorb the roughness of the ground on landing.

Among the copies that still exist today, one (D-Hesselberg) is exhibited at the Deutsches Segelflugmuseum mit Modellflug



on the Wasserkuppe in Gersfeld, the other (D-7059) which was recently restored, belongs to the OSC club always on the Wasserkuppe, airworthy once again. This link will allow you to see all the stages of the restoration:
<http://www.osc-wasserkuppe.de/images/Dokumente/Dokumentation-Bussard-Ueberholung_09082016.pdf>
<http://tinyurl.com/gpwhnuo>

This was a bit of the past history.

My idea to make a scale model of this aircraft began many years ago when I bought a kit and at the same time I came into possession of the drawings of the real Rhönbussard (26 scale sheets with measurements of all the smallest details). Pity that when I started mounting the kit this did not correspond to these

drawings. Above all it lost the beautiful shape of the egg-shaped fuselage ending with a very sharp edge towards the bottom that I liked a lot.

A few years passed with other ideas to elaborate and with the idea of making a scale model 1: 3, later discarded, until two years ago I decided to do it all again, a new drawing, scale 1: 4, and started the work. I will not go into detail about how I created the model, I know I am addressing more experienced model makers than me and the photos will render better testimony.

My model has a wingspan of 3.60 meters with a fuselage length of 1.45 meters and weighs 5 kg. I used an airfoil already tested in other models: the Go 549 at the root, 30 cm. chord. From the beginning of the aileron up to the end wing, the profile is developed in a symmetrical NACA 0012 with a minus 2° twist (washout).

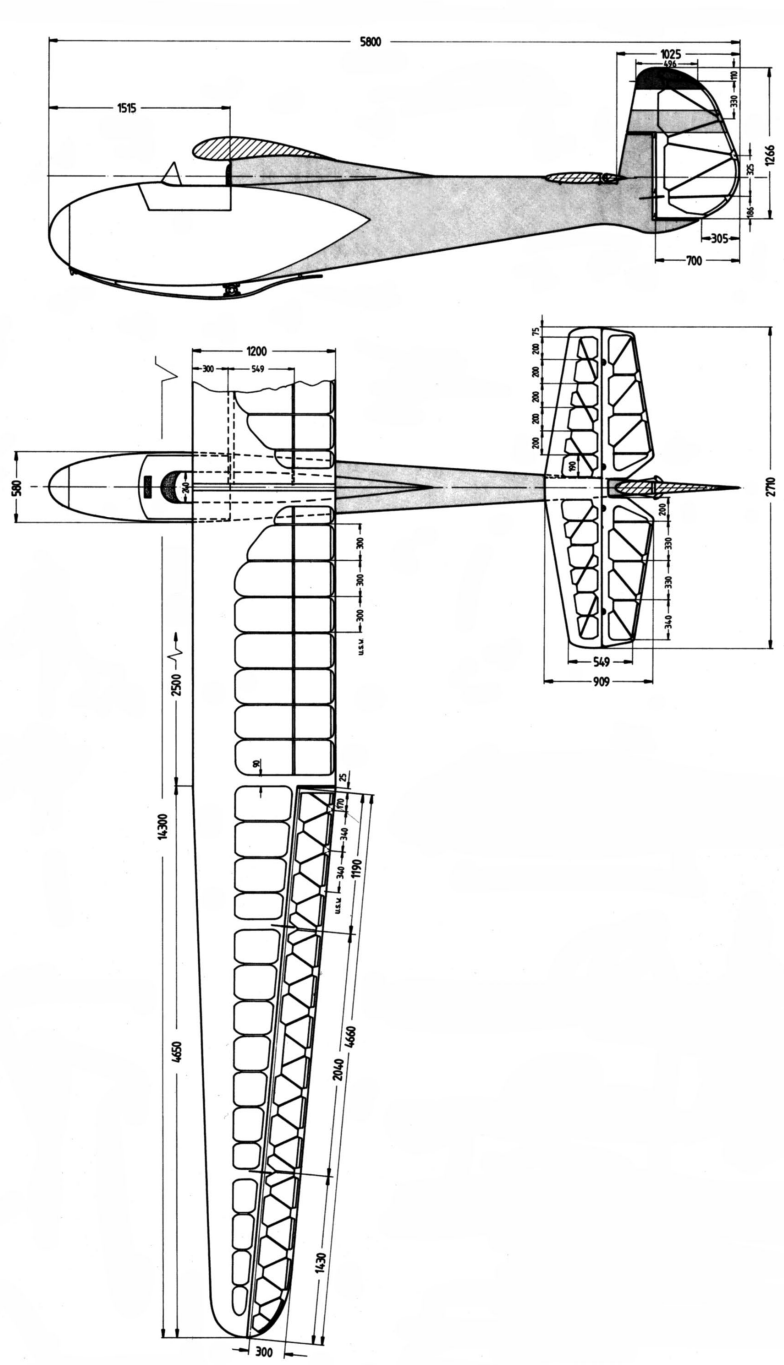
In choosing the decorations I followed the suggestions of a famous fashion designer who was inspired by the colours of the ‘contrade’ of the ‘Palio di Siena’ to blend the tones. And that is what I did, using white, orange with blue finishings as the colours in the ‘Leocorno’ district.

This link will help you find other combinations and learn about the folklore of my region: http://www.ilpalio.org.

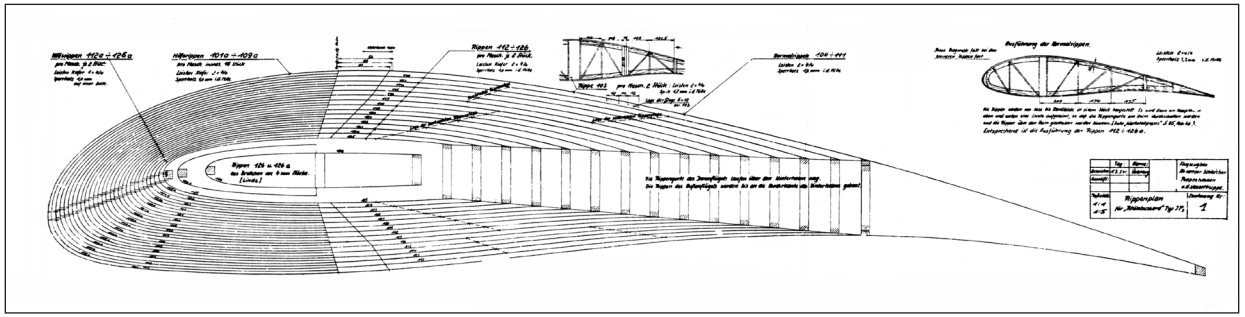
To make the pilot, I used the classic mannequin model used in design schools and I patiently modelled the balsa in the right scale. The pilot’s cabin is finished with the reproduction of some of the essential flight instruments and is removable to reach the controls of the model, the receiver and batteries.

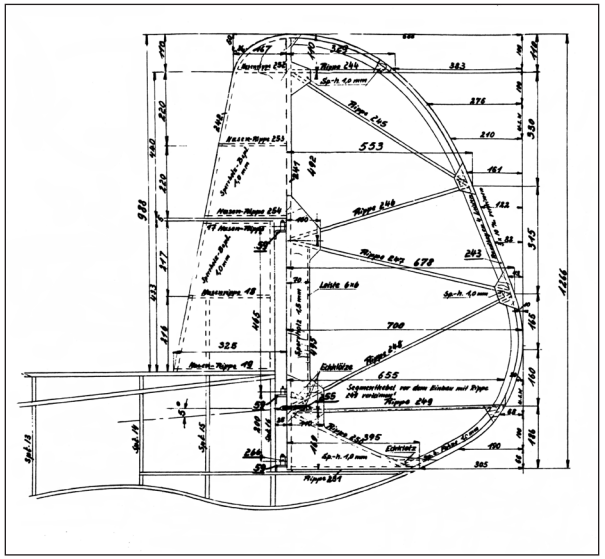
I tried to be as accurate as possible to the real drawings for all the measurements, the distance between the ribs, double transmissions to the ailerons, the cover band connecting the wings, and the directional transmission system etc.

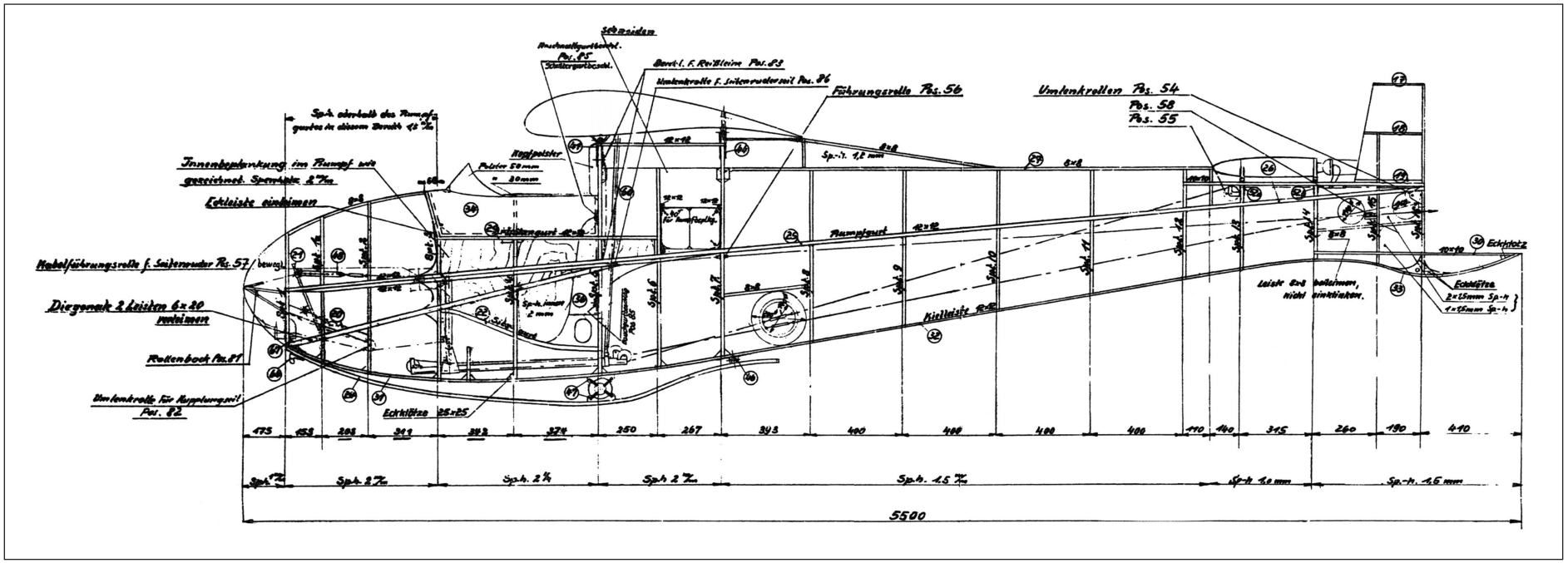
I have to tell you how I decided to make the building slip for the fuselage. The kit that I did not use recommended the construction of two semi-fuselages to be joined later: a procedure which is debatable in my opinion.

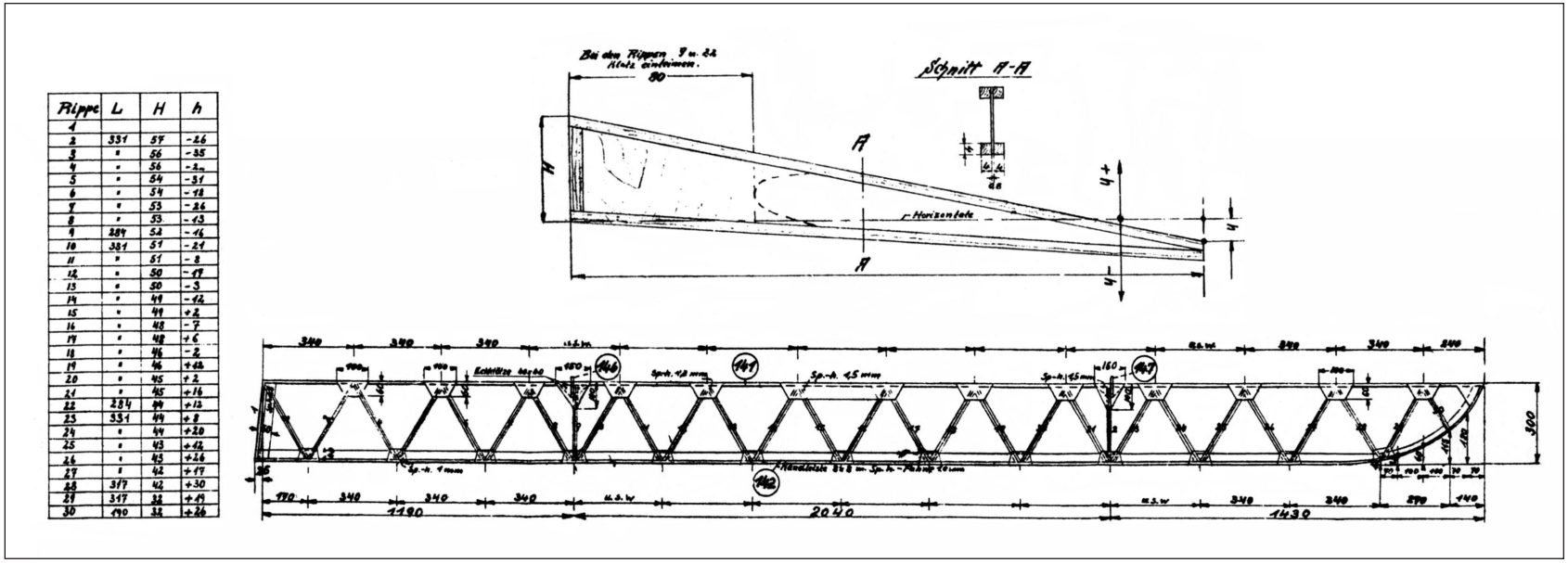


A few of the drawings used during model construction

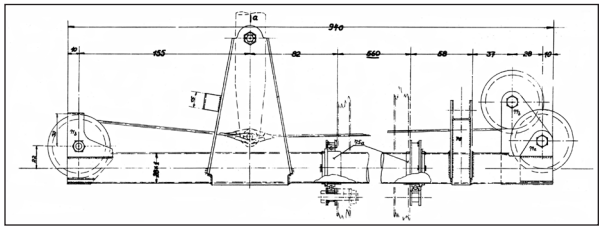


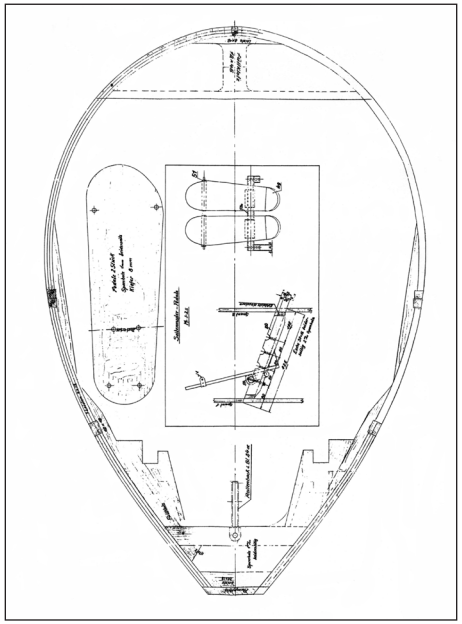


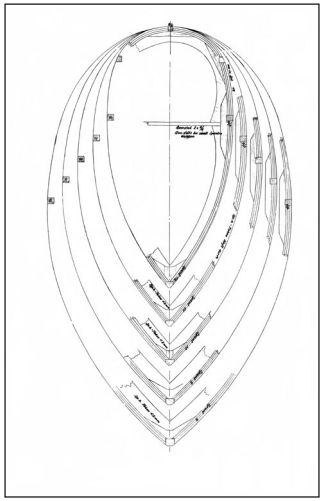


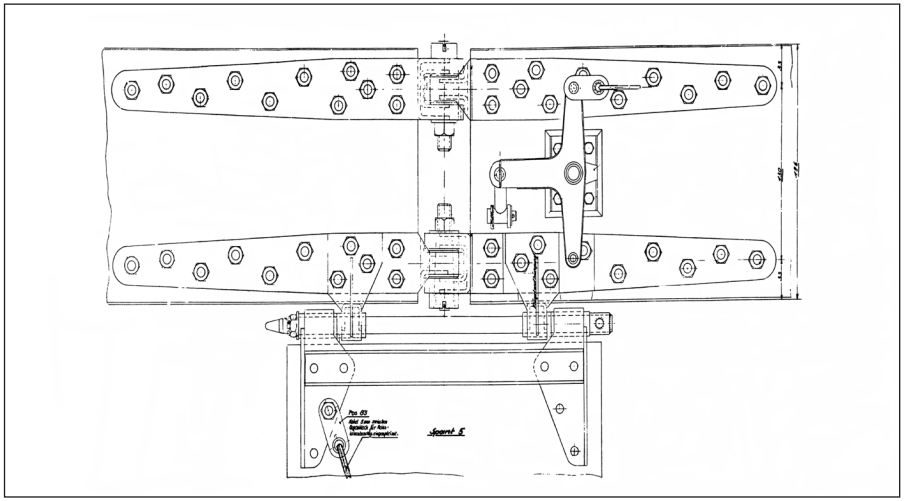


Rippe	L	H	h
1			
2	331	57	-26
3	"	56	-35
4	"	56	-2
5	"	54	-31
6	"	54	-18
7	"	53	-26
8	"	53	-13
9	284	52	-14
10	331	51	-21
11	"	51	-8
12	"	50	-17
13	"	50	-3
14	"	49	-12
15	"	49	+2
16	"	48	-7
17	"	48	+6
18	"	46	-2
19	"	46	+66
20	"	45	+2
21	"	45	+16
22	284	44	+12
23	331	44	+8
24	"	44	+20
25	"	43	+42
26	"	43	+26
27	"	42	+17
28	317	42	+30
29	317	32	+41
30	490	32	+26









D-Hesselberg exhibited at the Deutsches Segelflugmuseum mit Modellflug on the Wasserkuppe in Gersfeld

As you can see the fuselage has no connection for the entire length at 90° between the strips and the frames, this forced me to prepare the supporting spacers for the frames with an inclined side of 5°. So, with the frames well in line, the 3 x 10mm pine side strips glued, the upper and lower shaped pieces of 4 mm. plywood in their appropriate slots, I was able to complete the structure of the fuselage.

As I said before, the fuselage and the D-Box of the wings are covered with birch plywood and for the structure of the wings and tail surfaces I used the slightly thermoformable synthetic cloth and glued it to the ribs with cellulose glue, later treated with a sealer paint .

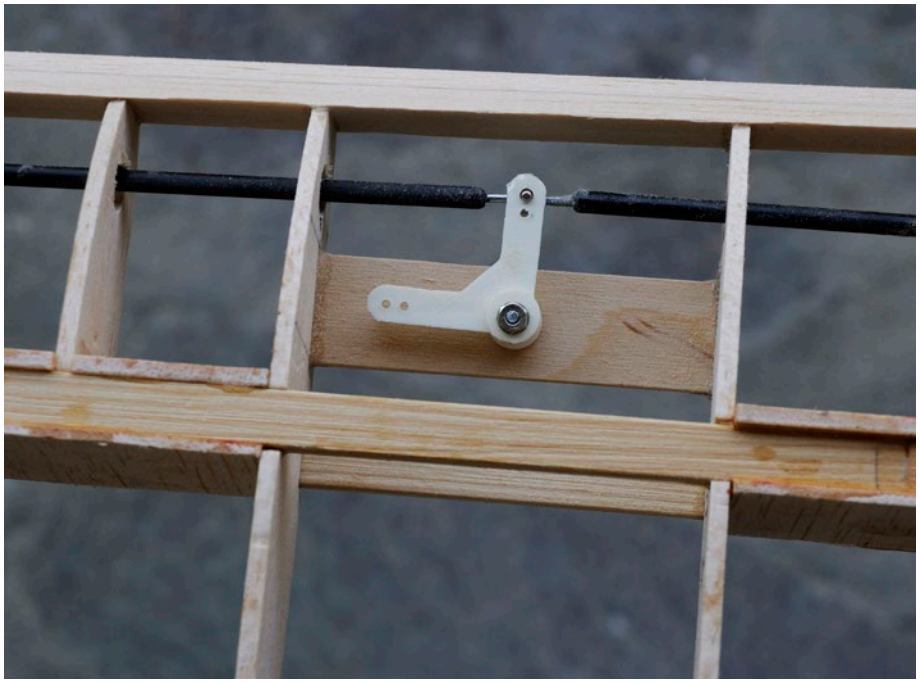
For now I don't know what the quality of the flight is like, all the controls: tailplanes, ailerons, tow bar are functioning, I only have to check the center of gravity. Everything is postponed to next spring. In order to transport both the wings and the rest of the model in the car. I have made two wooden boxes with precision joints and finished with a soft cloth to avoid damaging the paint.

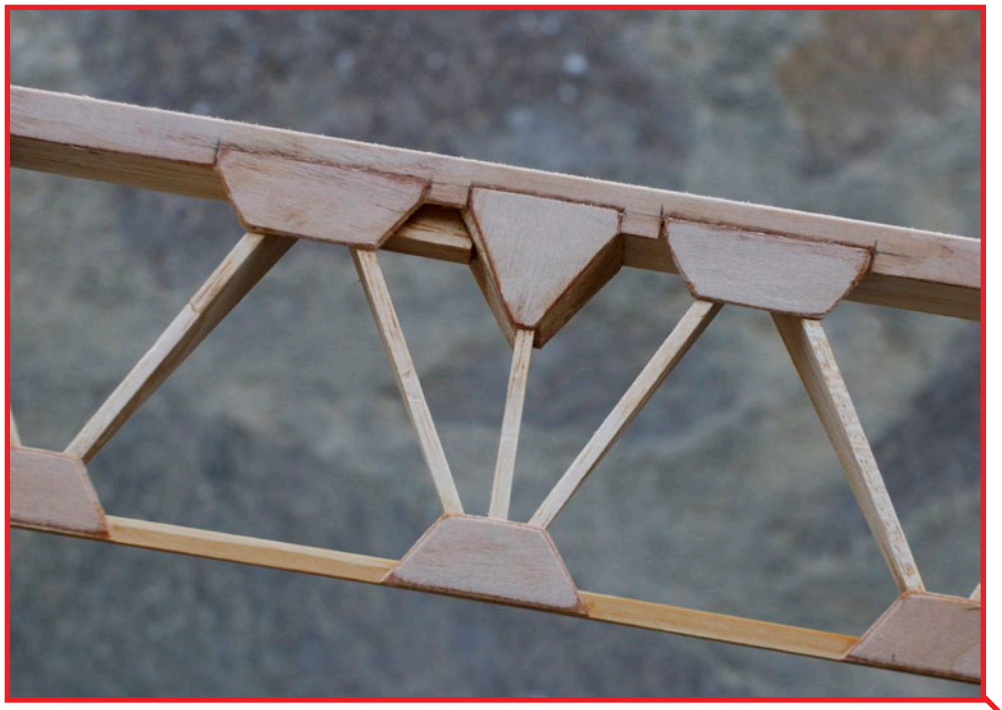
In 25 years of modeling work, this is my third reproduction of gliders or fourth if we also count a motor plane, the Fieseler Storch 156.

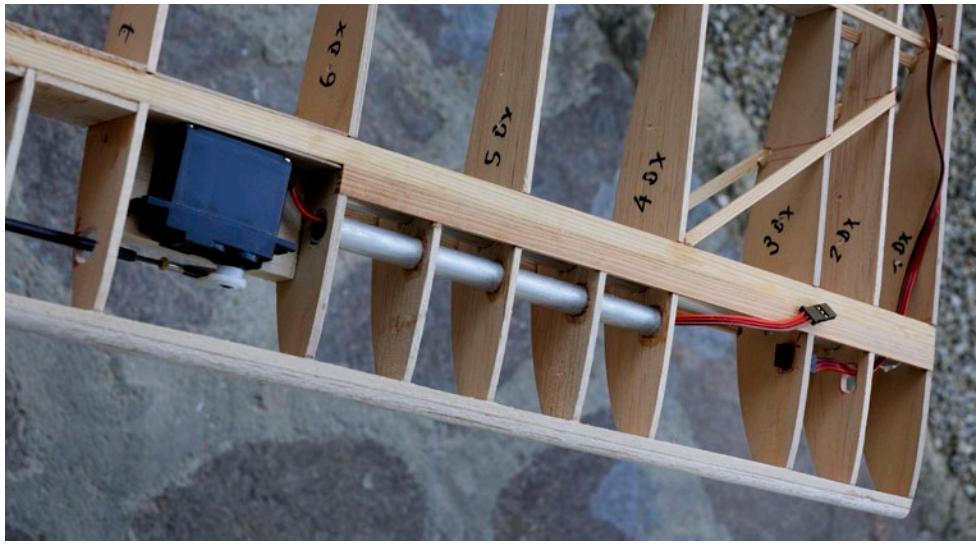
The next model? Surely another glider, but which one? I'm undecided between three projects.

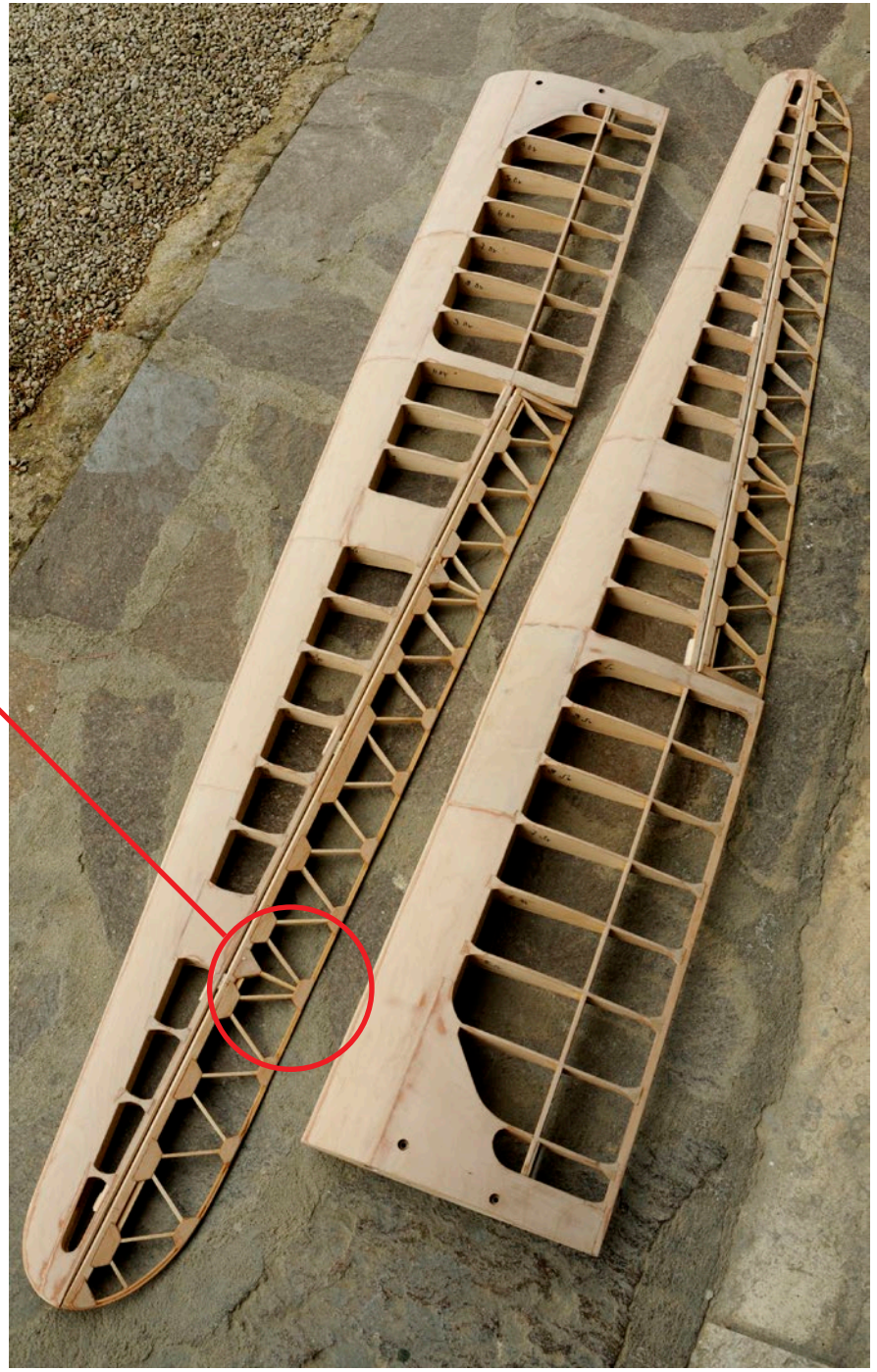
The author with the recently restored and now airworthy D-7059. which was recently restored, belongs to the Rhönflug Oldtimer Segelflugclub Wasserkuppe eV (OSC).

The restoration is well documented in a OSC publication: <http://www.osc-wasserkuppe.de/images/Dokumente/Dokumentation-Bussard-Ueberholung_09082016.pdf>



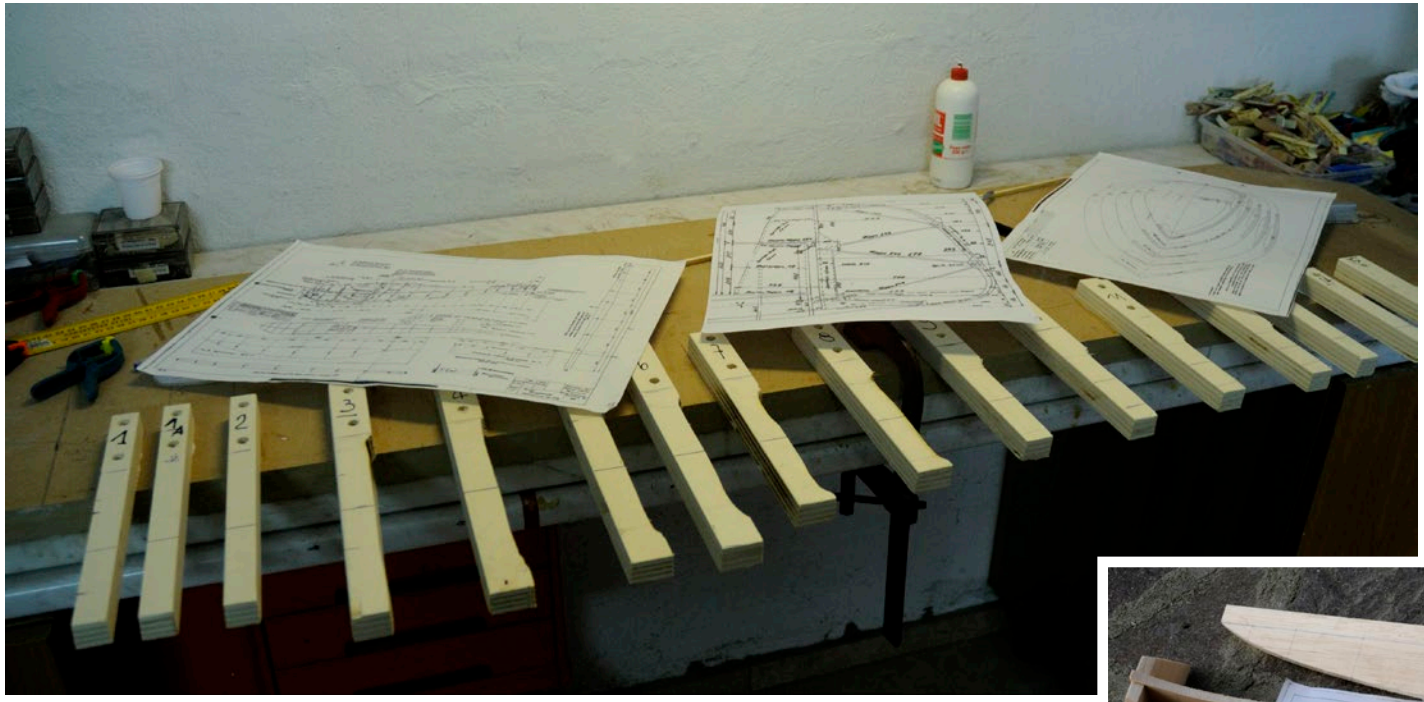



6 dx
5 dx
4 dx
3 dx
2 dx
1 dx



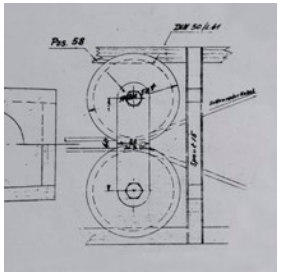
Wing prior to leading edge sheeting

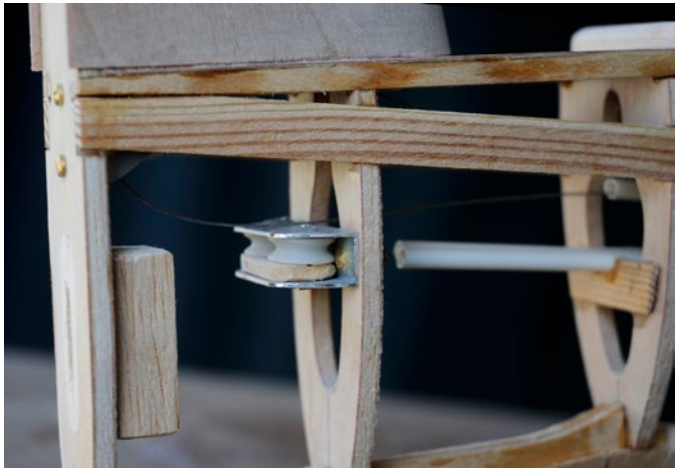
Rudder, horizontal stabilizer and elevator



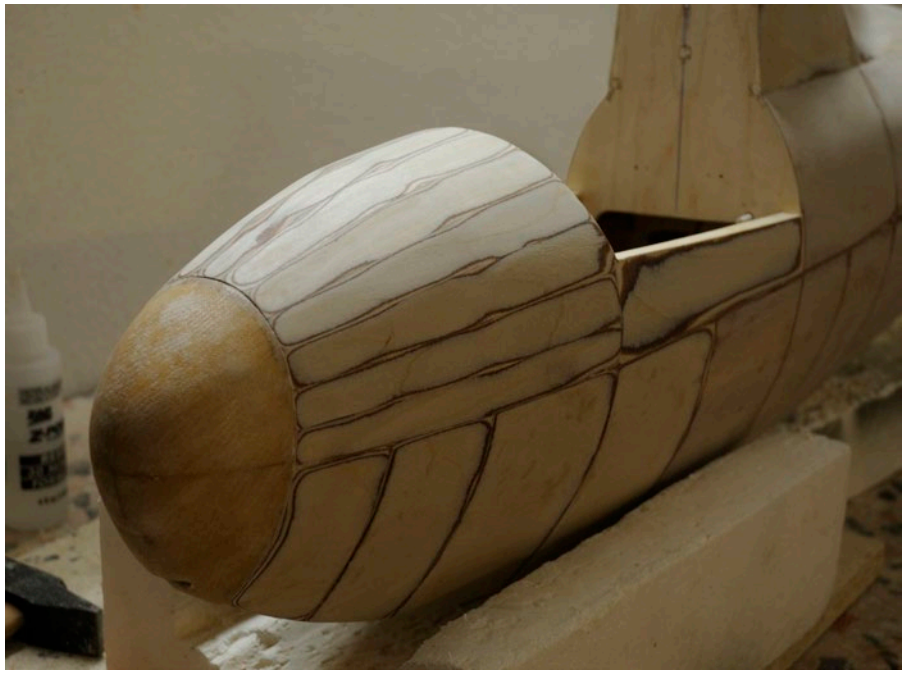
Fuselage construction fixture

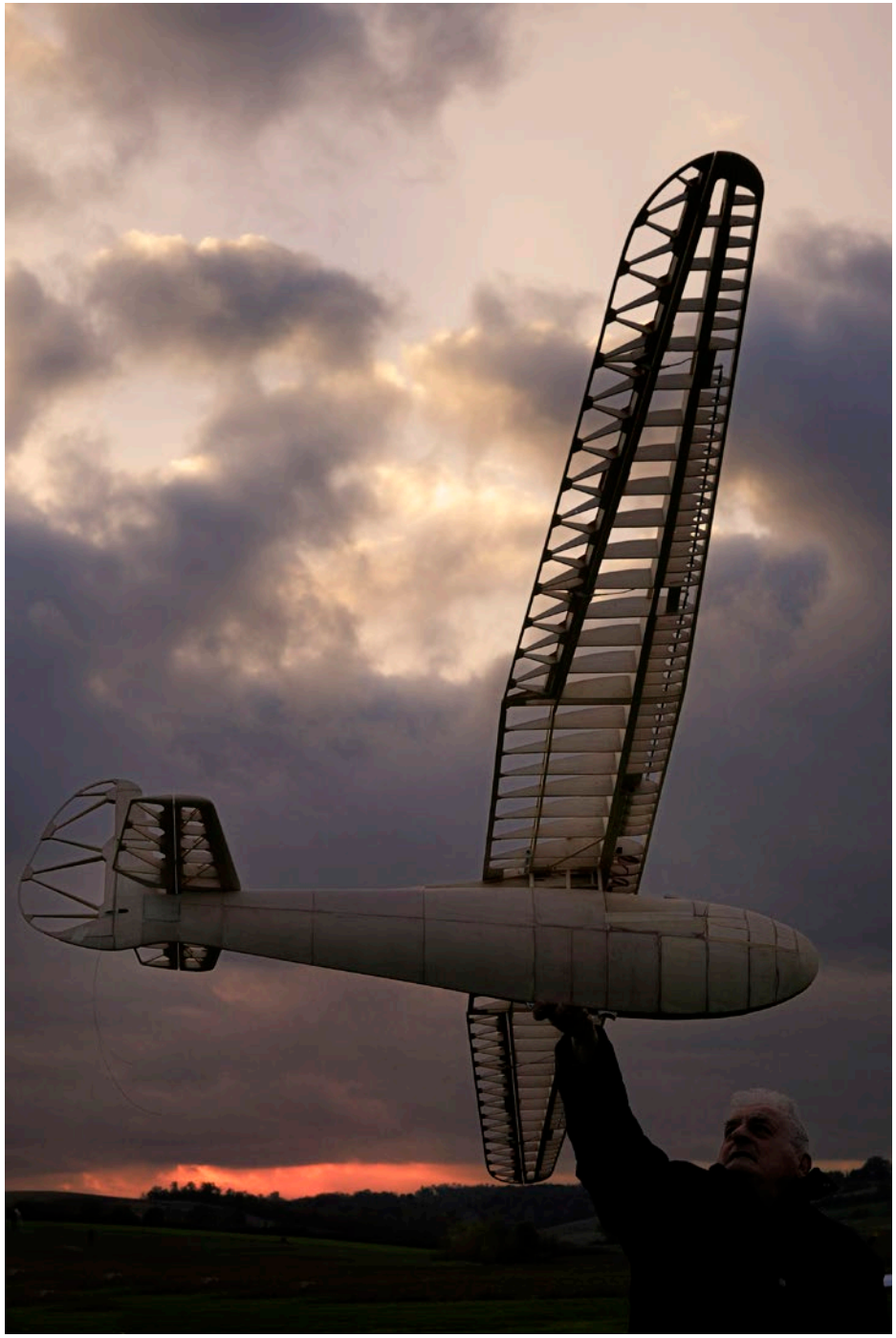
Fuselage lower keel and bulkheads

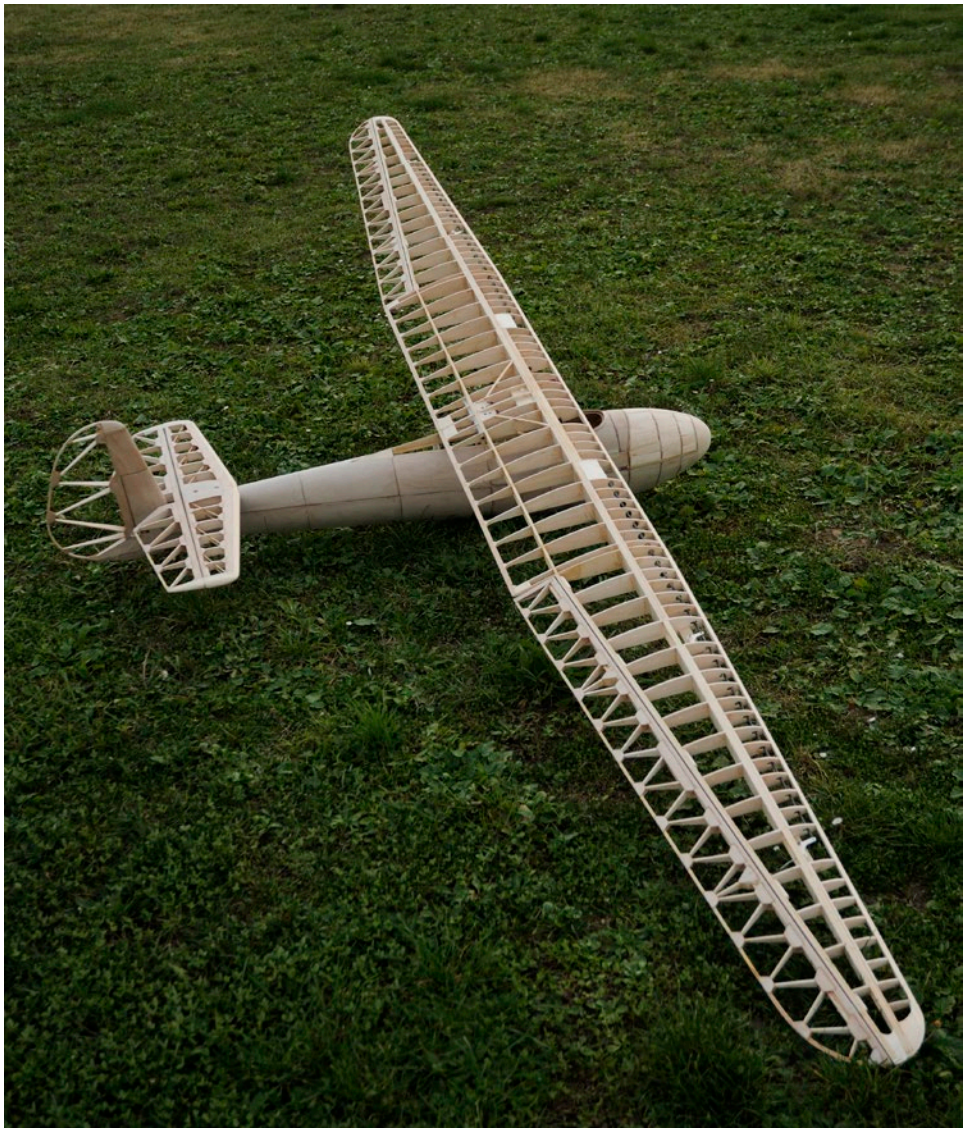




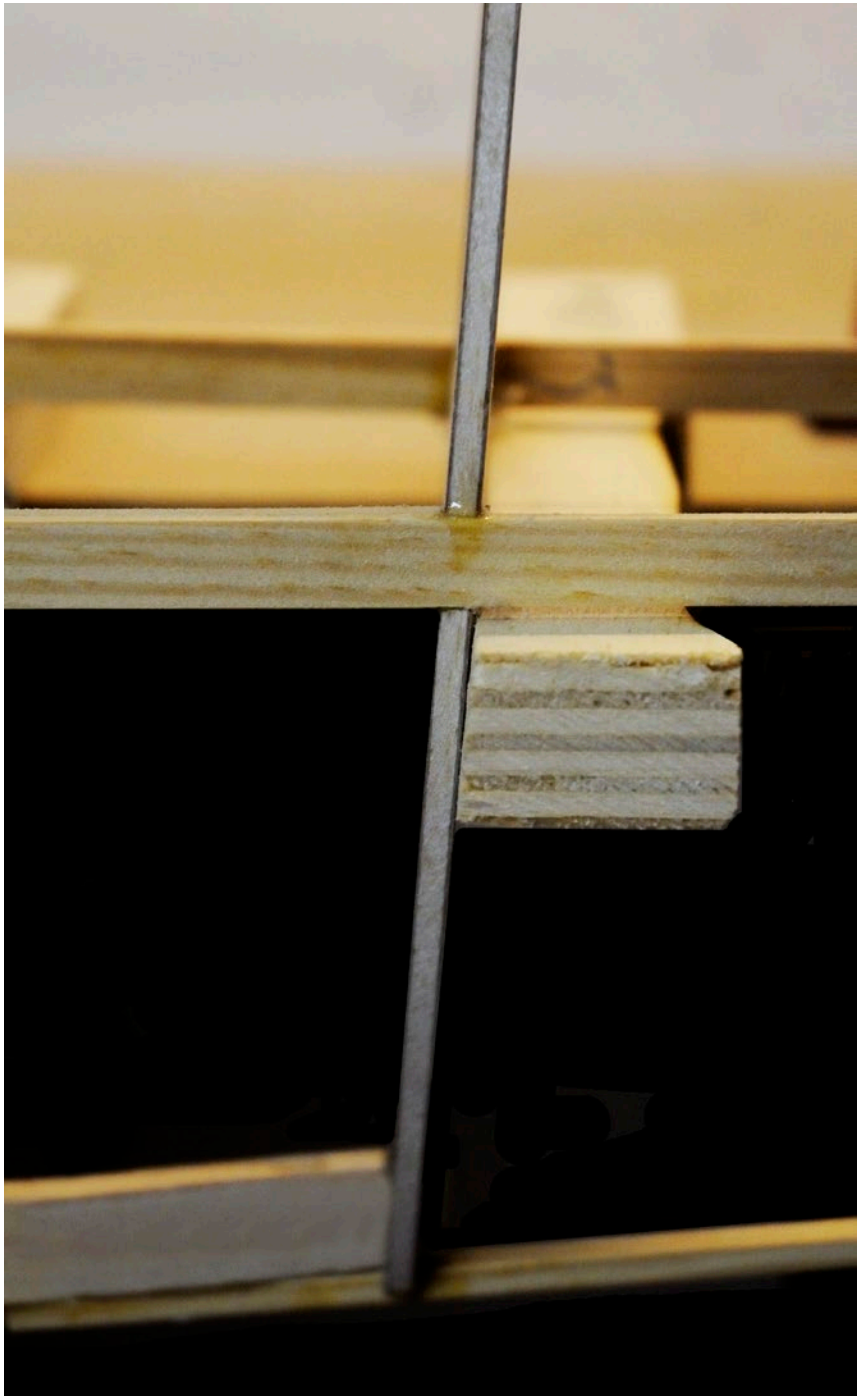
Fuselage assembly, pulley system in the tail







Completed skeleton ready for covering.

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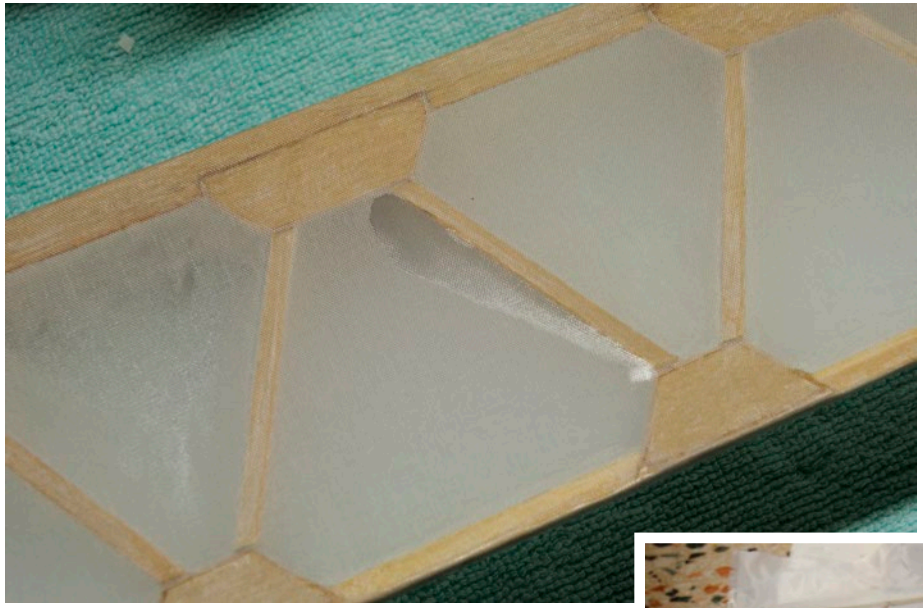
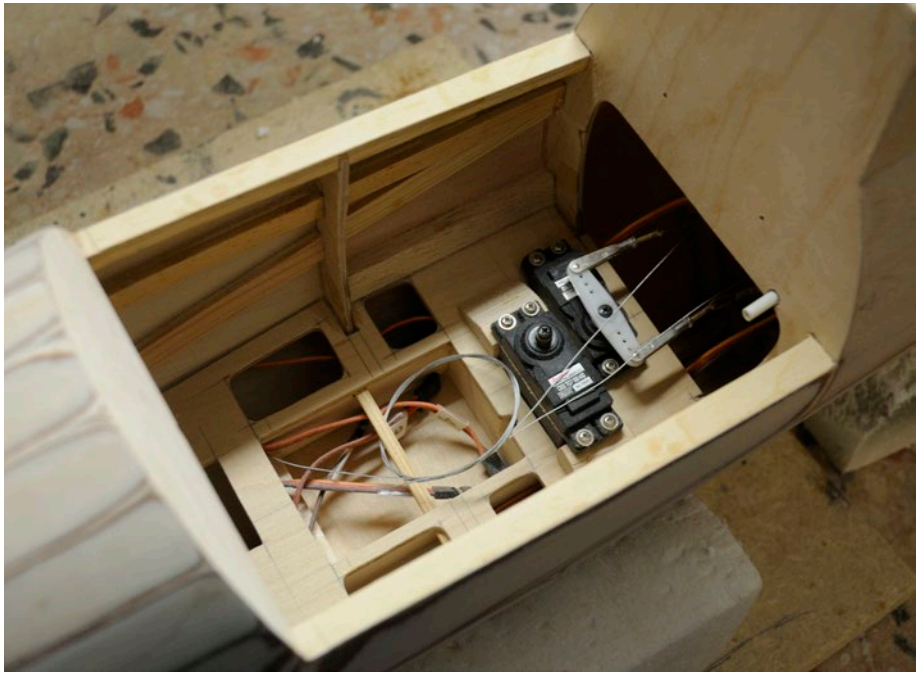
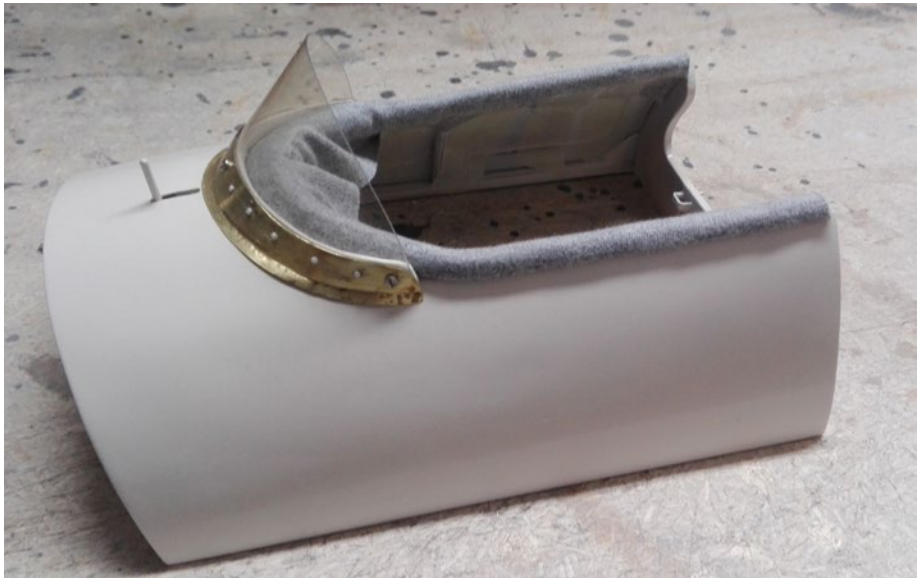
• EASY TO APPLY


PURO



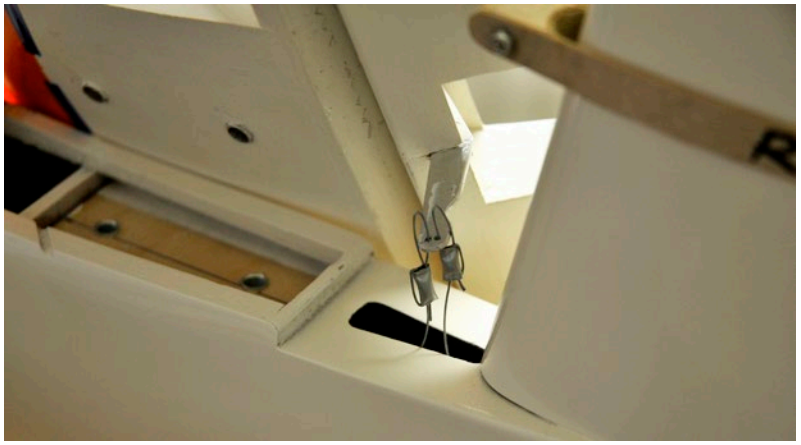
Covering the wing and horizontal tail





Interior with servo installation, cockpit details

Undercarriage detail, horizontal tail mounting system




Rhönbussard


hönbussard


Rhönbussard

Elia Passerini and the finished Rhönbussard

Review

RTGMODEL STRIBOG

Text by Pierre Rondel
Photos by Pierre Rondel and Joël Marin

Introduction

RTGModel (Milan Demčišák) released in 2016 his brand new flagship the STRIBOG. This is the successor of the Rotmilan Midi and the latest F3F glider of a family that started with the Extreme, then the Rotmilan, followed by a smaller version with the Rotmilan Midi. The STRIBOG features some nice evolutions.

According to Wikipedia, “Stribog” is the god and spirit of the winds, sky and air. He is said to be the ancestor (grandfather) of the winds of the eight directions.

The Stribog from RTGmodel has a 2.86 m wingspan which is ideally suited for F3F and slope soaring.

The kit with the wing and tail bags

The kit... How it comes

What is new?

There are several interesting improvements or modifications that I wanted to highlight below:

• Wing section is a HN airfoil (Norbert Habe) but different from the Rotmilan Series. It seems to have higher camber. I don't have unfortunately much detail as manufacturers are generally reluctant to communicate around this topic.

• The tail section is thinner.

• Particular flap shape with a smaller flap chord at the root: After exchanging with Milan I understand that the objective with the flap shape was to reduce the turbulence near the fuselage and, as a side effect improve the efficiency of the V-tail. Another advantage is that when down, the flap are not exceeding the bottom of the fuselage, limiting or avoiding damages if you forgot to retract them when touching the ground.

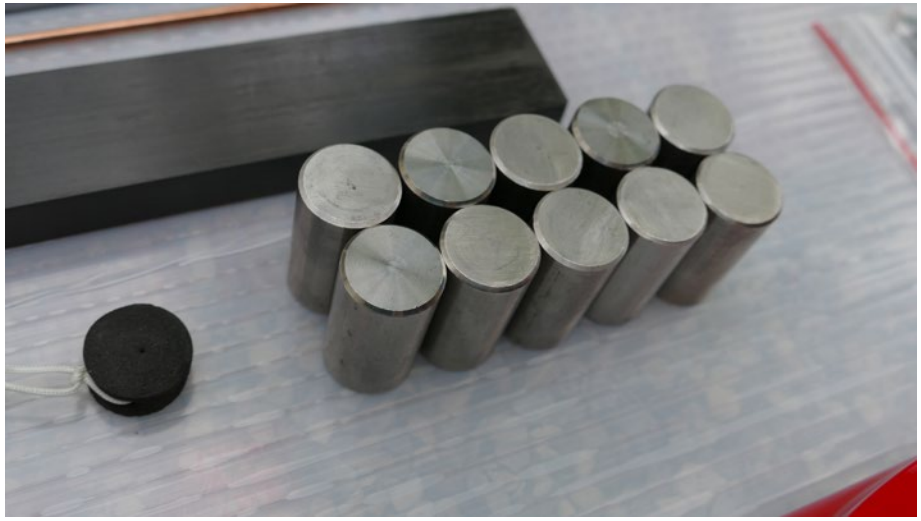
• Ailerons are running all the way out to the wingtip for better agility and maneuverability.

• The servos location is very different. Both flap and aileron servos are now very close to each other at the middle of the wing with a single servo cover. My guess for the flap servo location is that the objective was to control the flap at its largest chord.

• RTGModel can provide a nice LDS option with counter bearing for a slop free control.

• It is noticeable that the fuselage is the one of the Rotmilan Midi, without modifications as you can see at the tailplane root. The fuselage uses the same convenient layout and features a canopy, a molded servo tray, a fuselage ballast tube, all pre-installed. The front of the fuselage until the end of the elevator servos is fiberglass and Kevlar, and then we can see the carbon fabric from this point.

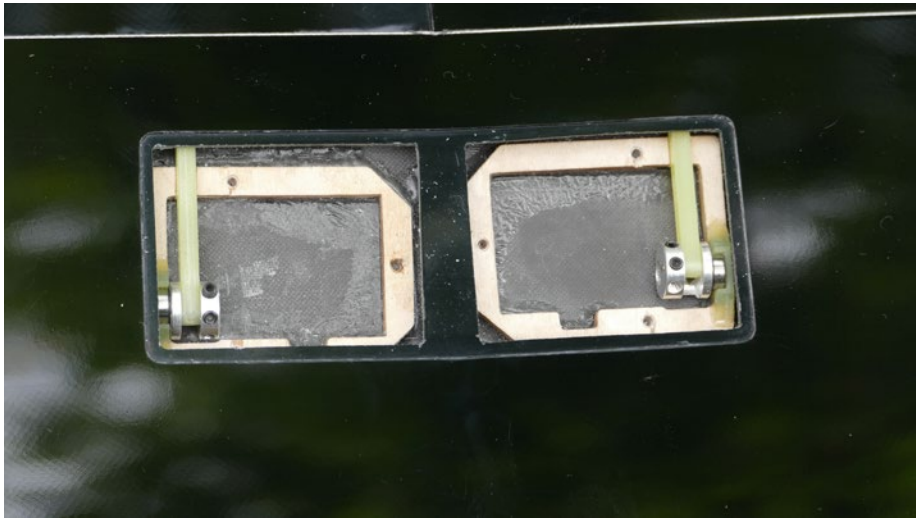
Molding quality is as usual with Milan Demčišák top notch, with perfect fit and alignment of all elements together, very thin join lines, nice paint, etc... A very nice plane and kit, no doubt.



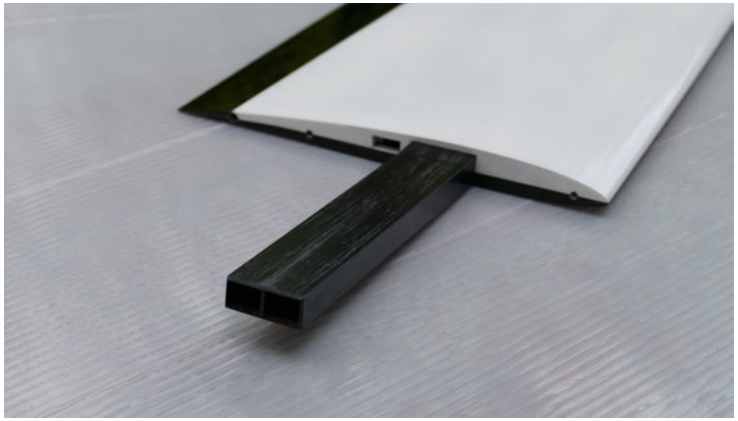
The 10 fuselage ballast with a total around 900gr

The nice hook in case you want to use a winch

The servo tray is molded and preinstalled, as is the ballast tube

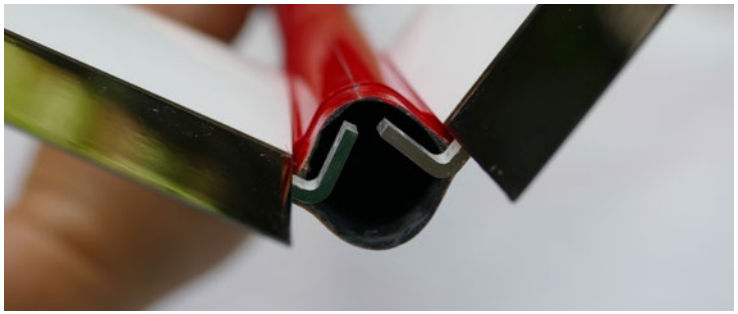


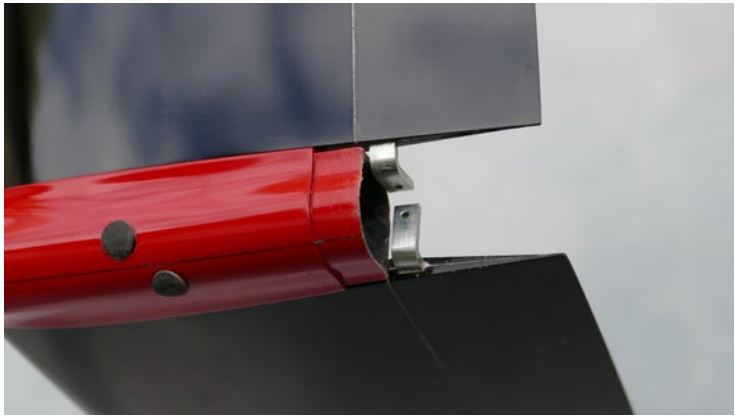
The wing servo location with frame in place, with counter bearing



The wing and the joiner, that can host some extra ballast

The tail root with joiner and aluminium horn





Above: The tails in place with the unusual control horns going up

Component weights are the following:

Left Wing, servo frames in place:	619 gr
Right Wing, servo frames in place:	614 gr
Fuselage with canopy:	371 gr
Left tail including the joiner:	41 gr
Right tail including the joiner:	41 gr
Wing joiner:	84 gr
Total:	1770 gr
Ballast:	895 gr

Assembly:

I usually start the assembly with the wings. This time, as the frames were already installed, I just needed to screw the two MKS HBL6625 in place with the correct neutral position, the control rod being fixed length. The external counter bearing makes the installation very tight and slop free. Servos are easily accessible and removable if needed.

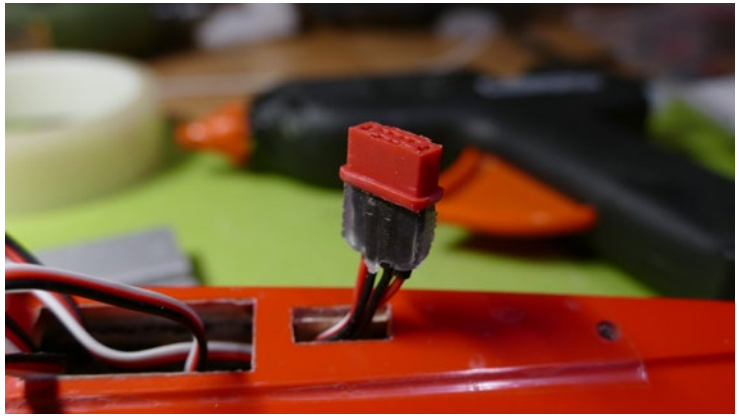
The fuselage being the same as the Rotmilan, layout is therefore the same. The most difficult operation is the wire routing which needs some patience and care to be done properly.

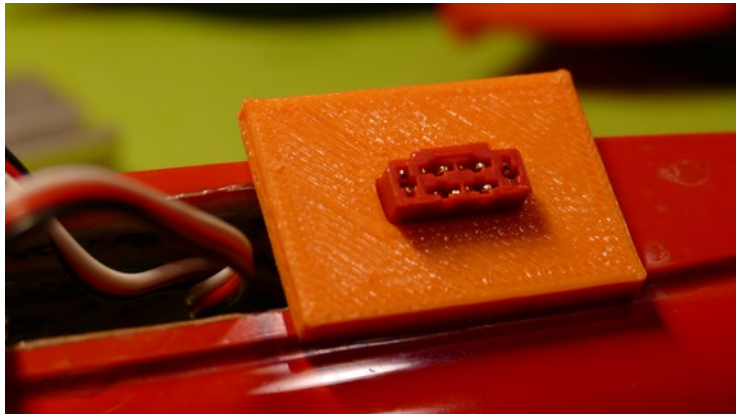
Here is how I proceeded: I succeeded to pass 2 x3 wires on each side of the ballast tube. I first prepare the cable on the servos side, with the JR/Futaba connector. Then, from the joiner hole, I used a flexible plastic rod that I passed along the ballast tube up to the nose; I tape 1x 3 wires to it, and pull. Then I repeat the operation three times, two servo cables on one side, two on the other side. Then I can complete the routing to the plug hole and solder the green plug on it.

To maintain the cables in place along the ballast tube, I used some hard foam. A small piece of EPP works fine, too.

To secure the 6-pin connectors in place on the root, I prepared first a sort of plug print by using a first part made from 0.8mm plywood crossing the fuselage and a second layer, shorter to create a stop. Doing this, I can then glue firmly the plug which is maintained on every side. I also created a 3D printed template to position the plug well perpendicular to the root while gluing. Before gluing, I protect the wires with some hot gun standard glue, easy to remove, no altering the wire or shrink, and providing a larger surface for the gluing.

The wood plate installed in the fuselage to host the 6-pin plugs



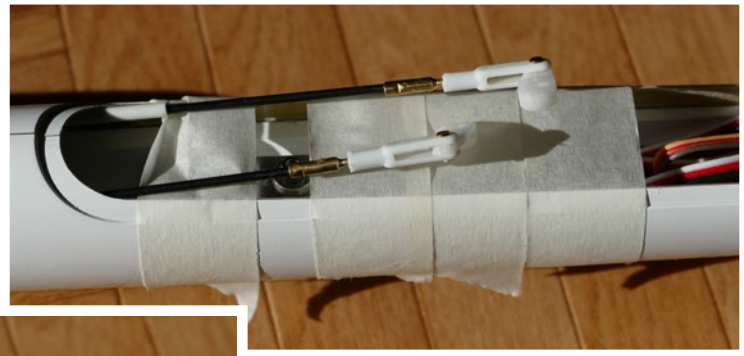


Far left The 6 pins plug, soldered, with heat shrink and hot glue case, ready to glue in place

Left: My 3D printed template to position perpendicularly the plug with the root

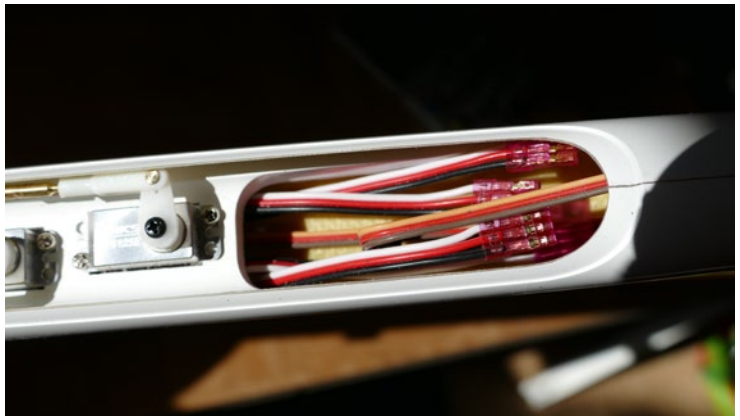
I used two MKS HV6125E servos for the elevator. Once in place, comes the elevator snake installation. To terminate the elevator control snake on both ends, I first remove the Teflon sheath on a few mm, and then used a MPjet threaded coupler drilled at 1.6mm, glued with rapid epoxy and pinched carefully in two points at 90°. I do the elevator end first, put the tail planes in place and at neutral position with some paper tape to immobilize them at the neutral position, I connect the elevator snake, with standard M2 metal clevises. On the servo end, I cut the snake at the right length, and do the same with the threaded coupler. The difference is that I use this time plastic clevises on the servo side.

Left: The two elevator servos in place



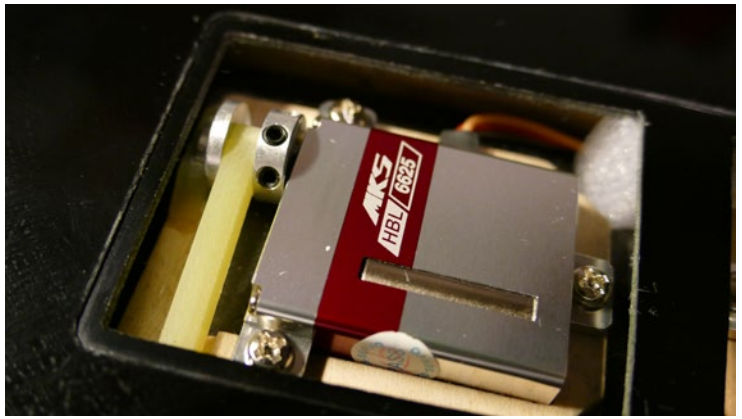
Above: The MPjet threaded coupler are glued and pinched on the snake rod

Left: Elevator snakes with MPjet threaded coupler in place and plastic clevises



Far left: The servo wires coming from the 6 pins connector. There is not lots of place for the routing

Left: The metal clevises in place on tail end



Far left: The two MKS HBL6625 servos in their servo frames

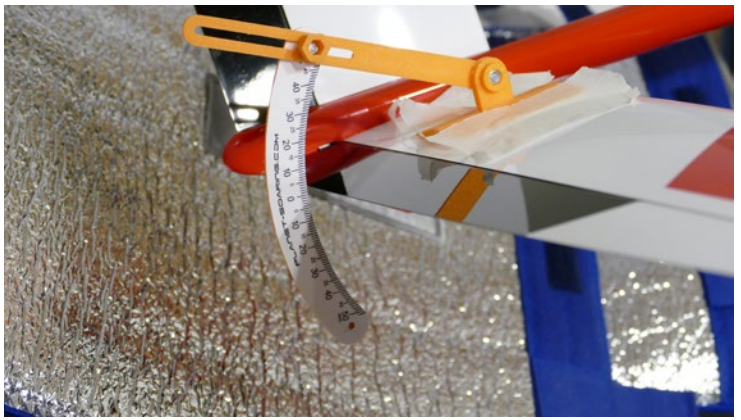
Left: The wing servo location with frame in place, with counter bearing

Left: The counter bearing makes the installation very tight and slop free

For more information on this system, please see
<http://planet-soaring.blogspot.com/2012/07/rdh-and-fu-fix-external-bearing-kits.html>
<http://www.sloperacer.co.uk/_content/hardware.asp>
<http://www.sloperacer.co.uk/_content/externalbearingkits.asp>

Preparing the mold for the balance lead

The nose lead finished



Settings in progress (To use with the settings table)

Let's return to the wing. You can let the wing servo connectors free, or glue them in place. I prefer the second method even if it requires some attention to not glue everything in place. To do this, I protect the root of the wing and the fuselage with thin tape, put some polyvinyl alcohol release agent where needed on the fuselage plug, connect the wing plug on it and glue it on the wing side with the wing in place. This gives a perfect alignment.

The battery is a 2S Li Ion 18650 format with 2900mAh of capacity (ref: NCR18650PF).

For the balance lead, I use some aluminium paper to wrap the nose, position the fuselage with aluminium vertically in the box with sand, remove the fuselage to let the aluminum in the sand. This creates a mold that I fill in with the correct weight of lead. Once cooled down, I grind/sand a bit and it is ready.

STRIBOG Settings:

CG		196 mm	
Elevator		7 mm UP	7 mm DOWN
Rudder		9 mm UP	9 mm DOWN
Aileron	Flaps	15 mm UP	10 mm DOWN
	Aileron	25 mm UP	15 mm DOWN
SnapFlap	Flaps	8 mm DOWN	
	Ailerons	aligned	
Thermal	Flaps	7 mm DOWN	
	Ailerons	aligned	
Speed	Flaps	7 mm DOWN	
	Ailerons	aligned	
Airbrake	Flaps	55 mm DOWN	
	Ailerons	15 mm UP	

The Stribog in company with the Rotmilan Midi

The Stribog in a nice landscape

At the slope

The maiden flight was in Ardèche on a nice cliff but in light conditions. Everything went well and I immediately felt that the Stribog was very different from its predecessors. When the Rotmilans were naturally fast but were lacking a bit of grip in turns, especially in light conditions, the Stribog is clearly keeping the fast straight speed, but adds lots of grip in the turn, and a very good agility.

And the Stribog continues to perform when the wind and the lift is growing, and is not disturbed by strong wind. By adding two tungsten slugs in the joiner, I could go to 1.400 kg of ballast, and the Stribog was still happy and continued to deliver.

The author and his Stribog

Snap flaps are working great and the Stribog is happy whatever the turn style, bank and yank where it shows an excellent energy retention, reversal, energy management, if the settings are adapted to the chosen turn technique. The ballasting is easy in the fuselage, where you can carry up to 900g. Over 900gr you will need to find a solution to ballast in the joiner. Personally I reused some 10x10 slugs, but needed to 3D print a spacer to secure the ballast horizontally. However, I know that RTGmodel can provide *ad hoc* joiner ballast slugs on demand as an option, which can be interesting.

Rapidly, I was confident enough to decide to engage the plane in the battle and use it during the summer in my preparation of the world championship, achieving my personal best, still in Ardéche on the same cliff, with a 26.21s. I also used it as my backup plane during the FAI/ World Cup contest of Col de Tende, doing the last four rounds with it, and winning this competition against some of the best F3F pilots. Then, in August, I used it in a league competition and won this competition.

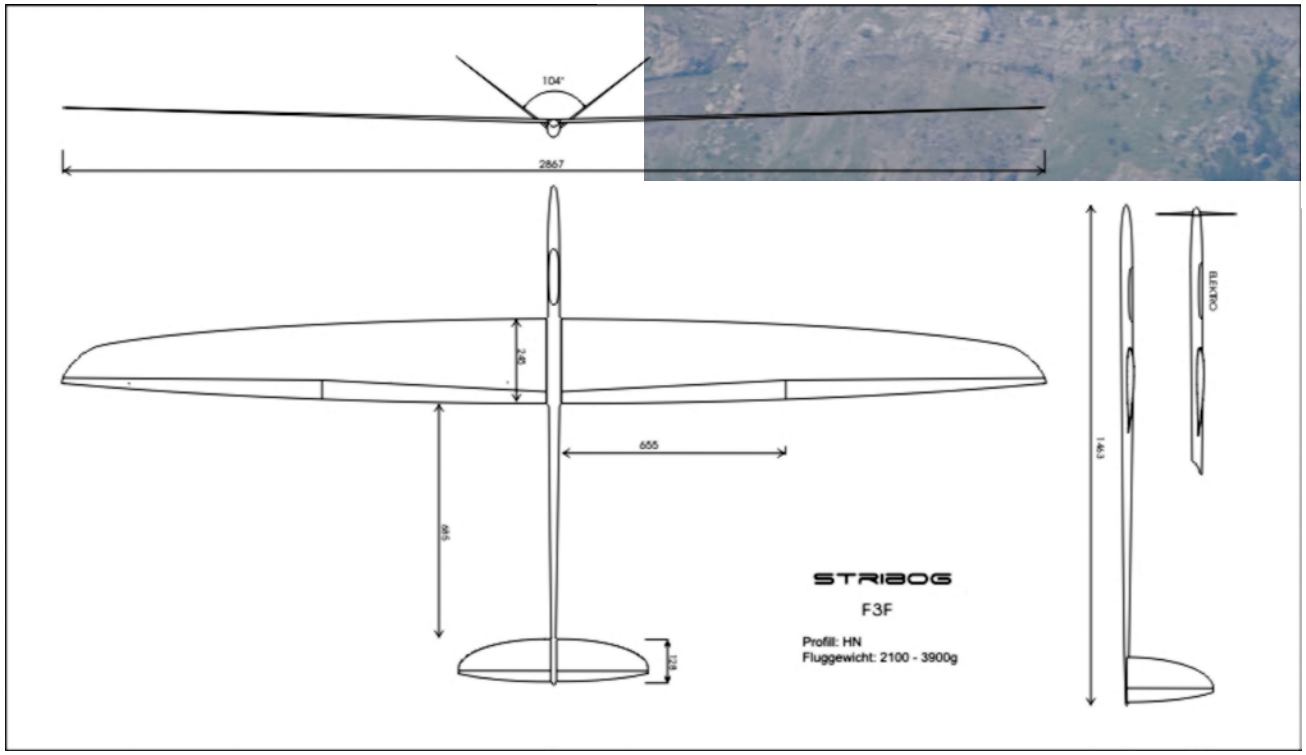
Overall, the Stribog demonstrated to be very competitive and at the level of other popular competition planes. I'm very pleased with the progress made on the performances in flight.

Technical data:

• Wingspan	2867 mm
• Fuselage length	1463 mm
• Airfoil	HN Straak
• Elevator airfoil	HN modified
• Wing area:	55,2 dm^2
• Projected tailplane area:	5,7 dm^2
• Empty flying weight:	2320 gr
• Manufacturer :	RTGModel <http://www.rtgmodel.sk/stribog.html>


STRIBOG


STRIBOG


104°
2867
295
655
695
STRIBOG
F3F
Profil: HN
Fluggewicht: 2100 - 3900g
1461
BEKBO

In conclusion

In brief, the Stribog is a real step forward compared to the Rotmilan and Rotmilan Midi. It keeps the best of the Rotmilan, the straight speed, and brings now the agility and grip in turns. On the market, the Stribog is a very affordable and a very competitive F3F plane, with a superb molding quality.

Nothing is better than a few videos to illustrate what I wrote. I propose you take a look at the video of the maiden flight, those showing a 29 and a 30s flights during French team practice this summer, and the last one which is a more edited video with some onboard and slow motion sequences.

Videos:

maiden flight:
<https://youtu.be/JQR26AjyNEQ>

29s and 30s flights:
<https://youtu.be/NY-xQCmgF4U>

Stribog in action:
<https://youtu.be/GOK-aDEyuJc>

Tom's iPS

Wing tip wire holders

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

Ever have trouble getting your servo wires out of your wing tip?

This wasn't my idea, but I thought it was worth passing on.

Make yourself some little plastic clips, or use the occlupanids that come on bread products.

That's all....

and if you lose one...

there are plenty more where those came from.

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occlupanid, from the latin *occlu,* close, and *pan*, bread. Technical term for those little plastic clips which hold bread wrappers closed. Thanks to Philip Randolph for this word and its definition.

South African Model Aircraft Association (SAAMA)/Model Gliding Association SIG

Postal Competition Regulations

Introduction

The Postals competition is a typical “thermal duration” competition, which includes a restricted launch, defined flight task and scored landing.

The Postals competition attempts to place everyone on an equal footing, but permits “home ground” advantage. This competition is considered the ideal development and promotion tool of the Model Gliding Association (MGA) Special Interest Group.

To further encourage participation, 2016 sees the addition of electrical powered glider models and encouragement for clubs to bring new pilots into the sport with low cost 2M, up to 2,5M RES and Composite models.

Climbing the Postals ladder is part of the fun, sliding down the ladder is a definite indication that you aren’t doing enough flying.

Dates

1. The contest consists of four rounds, flown on any weekend in February, May, August and November, the four scores giving the total for the year.

2. Each pilot may make any number of attempts to record a score during each round. These may be on any day of the weekends but, once started (stopwatch running on first flight), the pilot is committed to completing that day’s score for one of the submissions. Note that only one attempt per day is permitted.

3. Once the first flight on a subsequent weekend is attempted, that score nullifies the previous attempt. The last score of the attempts will be entered as the score for that round.

4. The club score does not have to be recorded by pilots on the same day but must be scored from the same venue.

Flights

5. Each entrant is entitled to FIVE (5) flights, which must be flown consecutively (allowing for legitimate reflights, or test flights which have to be nominated before launch)

6. All FIVE (5) flights, count towards the pilot’s round score.

7. Timing must always be performed by someone other than the pilot.

Launch

8. Launching may be by one of the following mechanisms:
   - electric winch (max available line from turnabout to ’chute 200 m)
   - bungee (200 m maximum stretched length)
   - 150 m hand tow, and two towmen
   - electric powered (the motor may only be used once for launching in a window of 30 seconds maximum and limited to a launch height of 200m
   - an onboard altitude limiting device should be used to achieve this). To limit costs, at the discretion of the club chairman/responsible person, foamies and unproven models may be tested with an altitude tracking device to determine motor run. When the model exceeds 200M within 30 seconds the altitude limiting device must be fitted.

Relaunch

9. A relaunch may be called for if the line breaks, or the model pops off and “re-launch” is called before the parachute touches the ground . The flyer must then land and relaunch as quickly as possible – if the parachute touches the ground before relaunch is called, then the flight will count.

10. A relaunch may be called by the pilot if the electric motor malfunctioned during the 30 seconds launch window.

11. Once relaunch is called by the pilot, the flight is immediately cancelled even if the model continues to be flown.

12. If any part comes off a model during launch or in flight , then the pilot may request a relaunch.

Models

13. There is no restriction on the number of models an entrant may use in the course of the contest.

14. The models will be classified into one of the following classes:

2M = Model with a projected wingspan not exceeding 2 000 mm and any number of controls
RES = Model up to 2,5M but controls are limited to Rudder, Elevator and Spoiler
Open = Any other Model this includes all built-up/composite models, of any age and wingspan.

Scoring

15. Scoring is as for Task A in the (old) F3B rules, i.e. to a precise six minutes and a landing bonus of 100 if the model’s nose is within one metre of the spot.

16. The flight time is taken from the moment the model leaves the line/electric motor cuts out, until it comes to rest

17. The landing bonus is measured after the model has come to rest and is reduced from 100 by 5 points for each metre beyond the spot (e.g. 95 points if the distance to the spot is from 1 metre to before 2 metres) down to 30 points or within 15 metres.

18. The maximum score per flight is 460 points and 2300 points per round.

19. A single table of results will be produced quarterly and will include details of the model class and pilot class.

20. The club score shall consist of the top four individual scores posted for the club per round. Each pilot can only enter one score towards the club total per round.

Submission of Scores

21. Scores are to be sent to the Postals Representative & must include:

- Club
- Pilot name
- Pilot Class (Senior, Junior, Rooky)
- Model Class (2m, RES, Open, Electric)
- Round by round times, etc.)
- Model name
- Span
- Launch method

22. Please submit all scores to the Postal Coordinator, Jan Sime — by email to 1jansime@gmail.com

23. These scores should be in the first Wednesday following the end of the designated month, or you will receive a zero score!

24. Scores not specifying pilot class will assume “Senior”, and similarly scores not specifying model class will assume “Open” – there will be no retrospective changes permitted.

25. Scores not specifying the model, wingspan & launch method will be deemed to be Open.