CIAM Flyer

Annual Report 2008

Dear readers

You hold in your hands, a wonderful educational tool. Our youth are tempted with many other activities, some far less stimulating than model aviation. Emil Giezendanner has consistently promoted aeromodelling to young people with the regular publication of the CIAM Flyers on the internet. We hope that you will find this compilation beneficial, and that you will use it constructively to generate enthusiasm and interest with persons not yet engaged in our wonderful sport.

Safe flying!

Bob Skinner
CiAM president

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The Introduction to the Modelaircraft World

Public Letter 1-08

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Editor: Emil Ch. Giezendanner
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Harry was unique, having a vision that the activity should be shared with the rest of the World. In 1962, Harry Stine presented the Federation Aeronautique Internationale (FAI) with details of what was internationally to become known as Space Modelling and at the same time drafted out some conceptual rules for competitions. 1964 enabled the Commission International d'Aeromodelisme (CIAM) of FAI, ratify these proposals and Space Modelling took its place alongside F1-Free Flight, F2-Control Line and F3-Radio Control Aero Models, as a recognised Airsport.

From here, the Sport – for that is surely what FAI Space Modelling is – began to grow into Europe and beyond. Dubnicky Maj - the first FAI Space Modelling contest - was held over the weekend of 28-29 May 1966, at Dubnica-nad-Vahom, in the former Czechoslovakia and featured some of the classic disciplines, which have stood the test of time, to the present day. Similar events developed around Europe and soon the inevitable happened..

..1972 saw Vrsac, near Belgrade, in the old Yugoslavia, host the 1st World Space Modelling Championships (WSMC) and the activity came of age. The now traditional biennial cycle of WSMC events had begun and soon a European Space Modelling Championships came together to fill the gap between successive WSMCs. The popular World Cup series was kickstarted in 1993, formalising the international events that had taken place throughout each summer. But what is Space Modelling all about?!?

How High? ..How Long? ..How Good?!? The generics of Altitude, Duration and Scale form the basis of all Space Modelling competitions and most owe their origin to Harry Stine's original concepts. All Performance rocket classes – S1-Altitude, S3-Parachute Duration, S5-Scale Altitude, S6-Streamer Duration and

S9-Gyrocopter Duration have evolved into simple 500mm long x 40mm diameter lightweight projectiles. All are flown on restricted Specific Impulse, normally 2.5 Newton second (Ns) propellants – except S1, which is normally flown on 5Ns...often two-staged for maximum efficiency. The Duration events resemble F1-Free Flight competitions, flown over a series of rounds, with a Maximum Time set for each flight, with Fly-offs, as necessary. Glider classes include S4-Boost Glider and S8E/RC Rocket Glider Precision Landing – the former a free flight event for small gliders, once more flown over a series of rounds.

The latter is a Blue Riband class, larger high tech soarers, boosted on 40Ns propellants to 300m, with the object to score exactly 360 seconds, nailing a target line at that precise duration, with penalties for inaccuracy. Once more flown over several rounds, with the flyers in groups of five, scoring according to their precision.

A fly-off round is used to smelt the metal! Juniors fly smaller airframes under lower specific impulses in Major Championships, but slug it out with the Seniors with 'big' models at World Cups. Possibly more than in any other discipline within CIAM, Space Modellers employ their missiles as sporting equipment, like Field Athletes using a discus or javelin, on their way to the podium!

S5-Scale Altitude and S7-Scale mean what they say and say what they mean. S5-Scale Altitude and S1-Altitude are high performance events – airframes of tightly restricted dimensions, boosted on limited impulse and the altitude measured by trackers on the ground.

The difference is that S5 is for scale models, judged for accuracy/craftsmanship before flight, with the score arrived at by adding the static score onto the achieved altitude in metres...simple: S1simpler still...how high did it go?!?

S7-Scale is an elite event, with models of the World's most famous rockets being statically judged and then being flown, just like the Real Thing, with special effects like multi-staging, discarding boosters, satellite launching and the like. Magic!

Revelations and Evolution..
And evolve Space Modelling must, although the burgeoning numbers taking part illustrate an activity in rude good health, with a mean age that seems to be falling as the years go by. Traditional continents – Europe

Asia, with the inaugural Asian Space Modelling Championships being hosted in Kazakhstan, in 2007. Africa seems soon to join the roster.

The former Communist Bloc took competitive Space Modelling to its heart from the outset and the collapse of the Berlin Wall and the redrawing of national borders all over the former Eastern Europe posed challenges to the obsession. However, Srdjan Pelagic, legendary Space Models sub-Committee Chair, ensured that Space Modelling evolved to grow even stronger and more widely. World Cups – S4-Boost Glider, S6-Streamer Duration, S7-Scale, S8E/P-RC Rocket Glider Precision Landing & S9-Gyrocopter Duration - boast bigger entries year-on-year with literally 100s of competitors on each roster.

We lost the iconic Harry Stine at the turn of the Millennium, but he left us with a timeless legacy. The foregoing might give the impression that contest FAI Space Modelling is the be all and end all. It is not, but in no other way could the activity have developed so keenly, or spread so widely. As with any other facet of life, motivation to win medals sharpens the tools and improves the breed. Space Modelling ihas become a truly 21st Century Sport, that will get bigger and better.
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Winter Flying by the Lake

Is it enjoyable to go water flying in below-zero temperatures on a lake that's just freezing over? Read this report to find out.

by Hans Jürg Baum

Hard Frost
We're on our way to the lake, then a beautiful sight: all trees are covered in a white frost! Similar to penguins protecting their chicks from icy snow storms, we put our batteries in our trouser pockets to warm them up. After arriving at the lake, we find that it is only frozen over at the very edges and in certain spots. The first rays of sunshine penetrate the fog. Backlit steam rises from the lake. An indescribable atmosphere!

Whispering Electric Motors in the Still Winter Landscape
Our whisper-quiet electric motor models are ideal for the still winter atmosphere. Taxiing with a single water rudder attached to the left-hand float is no problem. I turn one or two circles in displacement mode to conjure up some small waves in the mirror-flat lake. They will make taking off easier. Now it's time for take-off precisely according to the textbooks. Open the throttle slowly and pull up a little so that the points of the floats emerge from the water almost to the separation edges. Carefully open the throttle more and more and patiently wait with pulled elevator until the speed picks up more. Then put the elevator in its neutral position. Another smidgen of power and here we go: Just as I had hoped, the slightly larger floats have changed from displacement mode to planing. Beautifully, like a planing windsurfer, the Piper Cub J-3 races over the water. A tiny positive nudge of the elevator and our kingfisher is airborne. I find out that the slightly larger floats do have some effect on the flying characteristics. Although the slow flying characteristics have not been noticeably affected, curves have to be flown with a bit more speed. Now I wonder what the water landing will be like. The Piper approaches with moderate speed into the light wind and just above the water level I use the throttle to reduce speed and carefully pull the elevator up a little. The floats touch down gently on the water and, after a brief planing phase, change to displacement mode.

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Caution - Icy Patches!
Now I'm headed for the airport. But my water rudder design no longer seems to work, so I have to steer as before: With a relatively large amount of throttle and full rudder deflection to counteract the side wind, I reach the shore. On reaching the shore, I discover that the water rudder is partly frozen and hardly moves. It looks like I'll have to winter-proof my design. My friend, an experienced water pilot, now demonstrates a perfect take-off with lovely planing phase before lift-off with his Taxi. A safe flight with low passes, so close you could almost touch the aircraft, is followed by the expected perfect landing. It is as beautiful to watch, as a flying swan landing on water. During his second flight, the effect of the elevator slowly eteriorates. He immediately brings the plane down and discovers that the elevator hinges, that got covered in spray during take-off, are frozen solid!

The Fog Returns, the Sun Disappears...
Meantime, the fog has returned. It is bitterly cold. The lake disappears in a haze of gray and the flying show is terminated, although my batteries would easily have been good for another two flights. As I anticipated, the models were completely covered in ice, especially on the undersides. So what? The ice will melt in the car or, at the very latest, at home.

⇐ An old water pilot's trick: When the lake is mirror-flat, the floats sometimes seem to literally stick to the water and won't start to plane. The thing to do, is to take one or two turns in displacement mode to create some small waves. These will rapidly spread and form an ideal runway.

⇓ My friends Robert and Bruno

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Gliding Silently and Powerfully through Manoeuvres

Aerobatics with RC model gliders

Aerobatics with gliders is fantastic challenge. Even in the early days of gliding, individual manoeuvres were practised for flight safety reasons. This is about controlling the aeroplane in difficult situations and flight states.

Competitions at all levels are now popular around the world.

As an almost logical consequence, over the last few years and in some countries, aerobatics have also become established in model gliding, as aerobatics with silent gliders soon proved to have a very special fascination for model pilots and spectators. This wonderful model flying category is intentionally based closely on people-carrying gliding aerobatics which affects not only the sequence of figures and individual manoeuvres but also the appearance of the aircraft themselves. Even the tow, when model gliders are taken up to launching altitudes of 500 to 700 metres above ground with a motorised plane, hardly differs from that for full-size aircraft. At championships, the motor-towing plane is usually fitted with an altimeter that constantly transmits the altitude to both pilots via radio. These telemetry systems enable all gliders to start their programme of manoeuvres from the same initial altitude. Together with the airplane's mass, the altitude achieved in this manner provides the stored energy which, once the towing line is released from the motorised plane, makes it possible to fly an entire aerobatics programme without an engine.

Depending on the manoeuvre, the pilot accelerates his plane more or less powerfully during descents and one manoeuvre follows another to form a compact programme, until the glider finally reaches the ground and touches down to land. Most flights follow prescribed programmes of manoeuvres. Freestyle programmes are also very popular. They are individually put together by the competitors and usually accompanied by music. To enhance the show effect, competitors attach smoke cartridges to their models, for example at both wing tips.

Later, more and more individual flight manoeuvres such as loops, turns and spins were performed and specially suited planes were even designed for gliding as an attractive aviation discipline.

Unlike those gliders designed for gliding and flying long distances, aerobatic gliders generally have a more compact shape and smaller but lower wings. This makes it easier to perform manoeuvres such as rolls and snaps.

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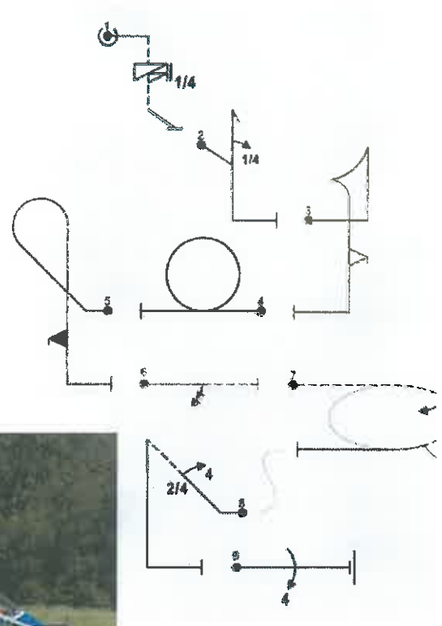
Anyone able to observe a gliding aerobatics model elegantly and silently gliding through the manoeuvres to the accompaniment of atmospheric music will hardly be able to escape the fascination. I am certainly deeply impressed every time. If you ever get the chance to experience this fine flying sport somewhere – be it as a spectator or even as a pilot – you will agree with me. Good luck!

↑ *Typical rc aerobatic glider*



↑ ***Drawing of aerobatic schedule for gliders***

Aero towing of gliders to start their manoeuvres from the same initial altitude ↓

Additional information
People-carrying gliders:
http://www.fai.org/aerobatics

Model gliders:
www.segelkunstflug-hummel.de

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Building Your Own Model Aeroplane

- Means Realising Your Own Ideas

First the planes are designed on paper an then drawn on packing paper in a scale of 1:1

Is Building Model Aeroplanes no Longer Popular?
The prospect that in a few years' time us model pilots will no longer be building our own planes, but buying them ready to fly instead, is a horror scenario for many enthusiasts. We frequently jump to the conclusion that today's young people are consumerist, spend all their time in front of TV and computer screens and are capable of neither creative nor skilful manual work.

A Successful Experiment
To prove this pessimistic view of the future wrong, we[1] recently conducted an experiment with a group of junior aeromodellers aged 12 to 14. The result was very encouraging: Over three days, based at the Fliegermuseum Dübendorf (Switzerland), the young people designed and built beautiful Depron electric flight models from scratch and fitted them with all necessary propulsion and steering components, so that they were ready to fly. Depron[2] is suitable for building virtually indestructible light model aircraft. The material is particularly popular with young people and in many cases replaces expensive balsa wood.

The full-size aircraft surrounding our workplace were additionally motivating.

Good Coaching Is Important
Us grownups were acting as coaches and supported the young people with our knowledge and experience. When building a model aircraft there are always a few key situations where the coach has to intervene to make sure a lot of good work isn't ruined in a short time. Due to their high competence, the young people recognised the coaches' authority without reservation, which is likely to have been one of the reasons why there were no problems with discipline.

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Visible Results
During the three-day workshop, all models – with the exception of one aircraft, which was of a more complex design and was finished at home – could be completed and were ready to fly. In an increasingly cerebral and virtual world of education, creations made using their own hands are of as yet unknown importance for the development of young people. Working with various materials and tools as well as the practical dealings with propulsion and steering are wonderful experiences with a large sensual content. But training of the mind is not neglected either.

The drawings are transferred onto Depron sheets and cut out

Installing propulsion and steering

Gluing the parts to form a complete aeroplane

Determining the centre of gravity

1) A group of committed and experienced aeromodellers from a regional aeromodelling association of the Aero Club of Switzerland.

2) Depron is an expanded plastic material – similar to polystyrene – with a smooth surface and high elasticity. The foam is used in-house building as a base for wallpaper or for sound insulation. Depron is commercially available in sheets of normally 3, 5 or 6 mm thickness. These sheets can easily be cut using a cutter and have been successfully used for building small and light model aircraft for several years. The material is usually glued with contact adhesive.

⇐
Painting the model to finish off a creative and skilled manual job

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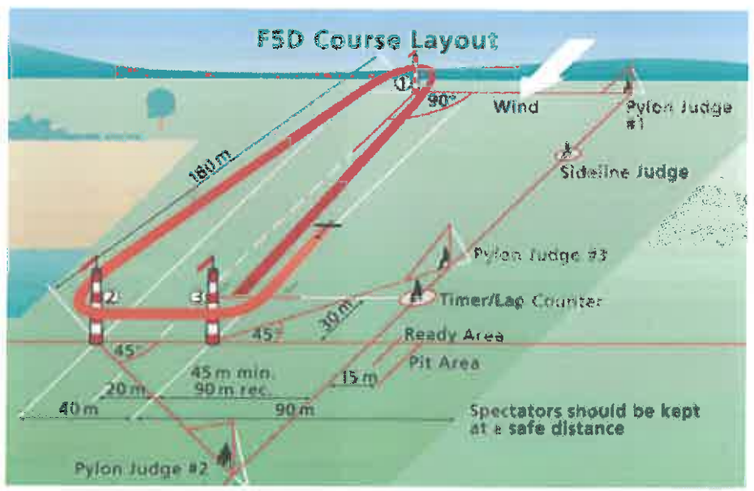
Those Daring Young Men with their Racing Planes

Electric Pylon Racing – not for the Faint-Hearted

Recently, the world championships for radio controlled electric model aircraft were held in Kiev, Ukraine. These world championships are always held for two different categories: electric glider models and electric pylon racing models (F5D). Here, we will take a look over the pylon racing pilot's shoulder.

Pure Race Atmosphere

If you want to fly in electric pylon races, you need not only lightning reflexes but, above all, nerves of steel. Your model, along with to other planes, will be racing around three posts – the pylons – at the speed of a Formula 1 racing car and fighting for every metre and every tenth of a second. Your helper – called "caller?" – shouts at you to "turn!". You turn your model around abruptly and fly it around pylons two and three around you. One of your two co-competitors is flying beside you just a hair's breadth away and passes you. When turning at the top pylon you catch him again, but he remains close on your heels... Don't give up, don't let your concentration lapse and keep your hands steady. It's all over in a minute and you're looking for somewhere to land your plane. The other two pylon racers are also circling with stopped propellers and finally glide in to land.



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Electric Pylon Racing as a Reflection of the Development of Electric Drives

Pylon races with electric flight models were already being held as long as 20 years ago. The planes were initially quite large and equipped with landing gear which almost completely restricted races to sites with surfaced runways. The development of smaller and lighter motors and batteries produced the trend towards actual miniature racing planes. The landing gear was done away with and planes launched by hand.

That made pylon racing models easier to build, cheaper and also easier to transport. In addition, races can be held on any grassy field. The generation of brushless motors and even better batteries produced planes that were extremely fast and, due to their small size, more difficult to steer. There were frequent crashes, even as early as in the take-off phase. The International Association (FAI) made safety improvements for these races in two steps: firstly, model planes were required to be larger again and secondly, the amount of energy that may be consumed for the ten circuits was limited.

Nearly 300 Kilometres per Hour

The planes race around a triangular course with a circumference of 400 m. That adds up to a theoretical four kilometres that are flown in as little as 60 seconds, corresponding to a speed of 240 km/h. As the planes travel a longer distance, however, speeds are even higher. Competitors start in groups of three. Pilots are assisted by helpers/callers? who hand-launch the planes in quick accession. Whoever is fastest around the 10 circuits has won. If a plane doesn't fly around the triangular course correctly – the cracks call this "cut" – 10% are added to the pilot's time. Two "cuts" in one round are penalised with 200 points. A race is made up of nine or more rounds.

Daniel Mayr, Austria Electric Pylon Racing World Champion 2008

Electric pylon racing motors

The Planes
Today, pylon racing model planes – or rather racing machines – are mostly made from fibre reinforced plastic and weigh at least one kilogramme. The rules also stipulate that wing loading may be no more than 65 g/dm^2. This means that there may be no more than 65 grammes of weight for each square decemeter (= 10 x 10 cm) of wing and elevator surface. Taken with the prescribed minimum weight, this results in models of around 1.2 m wing span that are easily launched by hand. The plane's motor may use a maximum of 1,000 W *min (60 kJ) for the 10 circuits of the triangular course.

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A Glider Self-Built to the Scale of 1 : 3

Model flying is a versatile hobby. While some buy nearly finished model planes, others plan, design and build their machines from scratch. In this case the first flight is a very special experience.

Building a Replica of Diana 2
The original glider Diana 2 was designed by Bogumil Beres in co-operation with the Technical University of Warsaw. The plane was a big success from the start and won several international competitions. This persuaded the two experienced model aircraft builders, Richard Oberholzer and Georg Staub from Zürich, Switzerland, to build a replica of this plane in a scale of 1 : 3.

They started by building the fuselage positive. Hard foam segments were glued to a central aluminium tube and machined until the surface was smooth. In the next step, the fuselage mould was built from glass fibre reinforced plastic.

The white fuselage then emerged from this mould. A retractable and well suspended landing gear couldn't be omitted. Such a fuselage weighs about 1500 g which is not bad, considering its size. The builders also shaped the very long transparent cockpit hood. Accurately cut foam segments were used to make the wing, which was then planked with thin sheets of Abachi wood. The wing spar was made from hard foam, woven carbon fibre and approximately 70 metres of carbon fibre rovings. Ailerons and plain flaps were only cut out at the end and flexibly glued on with silicone. The winglets are detachable to make transport easier. A ready-to-fly wing weights about 1300 g.
The construction of the rudder and horizontal tail unit is the same as that of the wing, but without a spar.

The two experienced model aircraft builders with the scale gliders DIANA 2

Waiting for good thermal conditions

Flying and Control
Three positions for the plain flaps were programmed in the controller which are retrieved via a three-point switch. In the speed and slow flight positions all three flaps follow? but with decreasing outward deflections. When cirling in a thermal current, only the outermost flap acts as an aileron. For take-off and ridge soaring, the middle flap is added as an aileron, but with reduced deflection. Using the crow position quickly reduces speed. The speed range flown to date is between 30 and 250 km/h. When Diana 2 is pulled down from 300 m with a negative plain flap position and raced along the runway at low level she can barely be heard. Subsequently pulling her up appears to be interminable. The machine performs huge loops and one roll easily follows another. In its landing approach Diana 2 appears to be flying on rails. With the plain flap in a positive position, the final approach is slow and steady and excess altitude is efficiently reduced without speed increase using the butterfly position.

The two builders have invested a huge effort in their beautiful glider, but every flight makes up anew for the many hundreds of hours spent on developing and building Diana 2.

Technical Specifications of Diana 2, Scale 1:3

Length	2294 mm
Span	5000 mm
Root depth	241 mm
Wing tip edge	67 mm
Wing area	94 dm^2
Weight	6700 g
Ballasted weight	9400 g

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