

LIVA

Nr 2-23



Merry Christmas & Happy New Year!



*God Jul och
Gott Nytt År!*

SPEED • STUNT • TEAM RACING • COMBAT



I detta nummer: EM i Polen • F2C-historia • A Christmas Essay
• E-Weatherman • Pappersklädsel • SM • LassoGeier Luftzirkus
• Västkusträffen • Cessna GC-1 • Mills • Quiz • Vbg-pokalen
• Structural Strength • Austrian F2B Nats • och mycket mer ...



Lindflak



Balsaflak



Balsablock

Li-Po accar



Gens ace Soaring
3S 2700mAh 30C



Gens ace Soaring
3S 3300mAh 30C



Gens ace Soaring
4S 3300mAh 30C

Stort sortiment av:

Byggmaterial, lim, motorer, klädsel, verktyg, Proxon-maskiner, kablar, kontakter, hjul, LiPo-batterier, med mera.

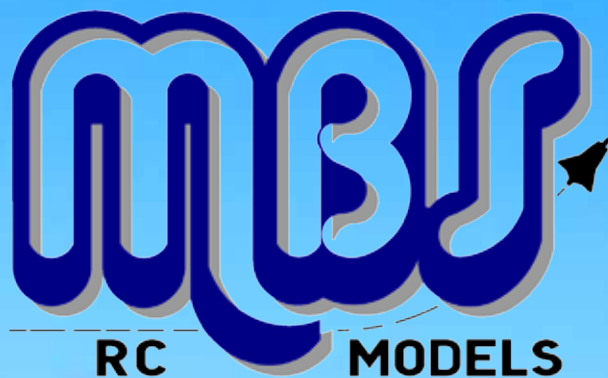


MBS RC Models Din hobbybutik!

I Herrljunga sedan 2009

Balsa, modellflygplan, batterier, båtar, dekaler, fartreglage, fläktar, färg, hjul, kablar, klädsel, kolfiber, kontakter, laddare, lim, lister, motorer, penslar, piloter, plast, plywood, propellrar, skruv, sändare, verktyg, väv, med mera.

Följ oss gärna på Facebook och Instagram!



MBS RC Models

Björkvägen 1, 524 32 Herrljunga
info@mbs-rcmodels.se
www.mbs-rcmodels.se
Telefon 0730-69 09 75

LINA

• SPEED • STUNT •
• TEAM RACING • COMBAT •

LINA – Nyhetsbladet för medlemmar i Sveriges Linflygares Intressefrämjande av Stunt. Bladet behandlar dock alla former av linflyg. Syftet med SLIS och LINA är att bidra till linflygets utveckling genom spridning av kunskap, skapa kontakter, förmedla nyheter, publicera ritningar samt informera om tävlingar och resultat.

LINA utkommer med 2 nummer per år. Ansvar att sätta samman tidningen delas av Ingemar Larsson och Niklas Löfroth. Bidrag till LINA mottages tacksamt av redaktionen! Ingen censur eller förkortning av bidrag utan bidragsgivarens tillstånd.

För 2024 kostar 1 års medlemskap inom Sverige 250:- medan det för Norden/Europa/Världen är 300:-. Avgiften sätts in på Plusgiro 96 34 51-0.



SLIS Websida: www.slis.org

Ordförande:

Staffan Ekström
Klockarevägen 10H
247 34 Södra Sandby
072-179 23 99
staffan.ekstrom@telia.com

Redaktör

Lina Nr 2, 2023:
Ingemar Larsson
Forbondegatan 14
462 41 Vänersborg
0703-40 44 05
ingemar.larsson.vis@telia.com

Kassör:

Ingvar Nilsson
Källbäckstrydsgatan 11B
507 31 Brämhult
070-207 44 94
ingvarl.nilsson51@gmail.com

Sekr./Redaktör

Lina Nr 1, 2024:
Niklas Löfroth
Skolbacken 12 C
656 71 Skattkärr
070-209 69 65
niklas.lofroth@icloud.com

Foreign subscribers

If you live outside Sweden and want to become a subscriber of Lina you can use PayPal to transfer our subscription fee. Contact Niklas or Ingemar for details.

Photos

Apart from the authors we give thanks to Massimo Semoli, Bjarne Schou, Henning Forbech, Timo Forss, Axel Jungherz, Igor Milenin and Bert Gijbsbertsen.

Är vi lyckliga ...

vi som har en hobby jämfört med de som inte har en? Man kan ju läsa på alla möjliga ställen om människor som beklagar sig för allehanda saker, typ: –November är så grå och trist!, –Det har ju varit så dåligt väder!, –Jag mår så dåligt på våren!. –Dagarna är så tråkiga! –Det är för mycket snö!, –Vad ska jag hitta på?, –Det är för lite snö! med mera ...

Måste ärligt erkänna att jag aldrig känt så då jag har en hobby och ett byggrum jag gärna befinner mig i. Plus en "Bucket-list" att beta av! Vilket aldrig kommer att bli fallet då den ständigt fylls på med nya projekt och det är ju precis som det ska vara. Liksom att punkterna på den flyttas omkring. Ibland vill man ju flyga och då uppskattas bra väder men är det inte fallet är det bara att förflytta sig till sin egen "Man cave" och njuta. Läste en bok om att i princip alla höll på med en hobby för typ 70 år sedan men att det avtagit genom åren. Vilket väl måste vara synd! Nog skulle fler må bättre om de hade ett intresse likt det vi modellflygare har? Själv ska jag fortsätta med flera projekt parallellt så fort Lina har gått till tryckeriet. Men Ni sitter väl redan i byggrummet?

/Ingemar Larsson

INNEHÅLL I DETTA NUMMER:

• FAI Euro Champs av Ingemar Larsson.....	4-7
• E-Weatherman in Class E1 av Daniel Rota	8-11
• Svenska Mästerskapen av Michael Palm/Ingemar Larsson	12-14
• Pappersklädsel av B Jansson/I Nilsson/I Larsson.....	15-17
• An Essay from the Lincolnshire plain av Stephen White...	18-19
• Cessna GC-1 av Karl-Georg Krafft/Ingemar Larsson	20-21
• Vänersborgs-pokalen/RM av Ingemar Larsson.....	22-23
• FAI F2C World Champs podiums av Ingemar Larsson	24-29
• Amusements - Quiz av Conny Åquist/Ingemar Larsson	30-31
• Västkustträffen av Michael Palm/Ingemar Larsson	32-33
• Austrian F2B Nats/Steinfeld Cup av Heimo Stadlbauer.....	34-35
• Scale effect on structural strength av Piero Incani.....	36-37
• Tips från Coachen av Per Stjärnesund.....	37
• Gurney Flaps av Johan Rasmussen.....	38-39
• Nostalgi: Limfjordstävlingen 1975 av Ingemar Larsson	40-41
• Lassogeier Luftzirkus av Axel Jungherz.....	42-45
• The Mills Story av Adrian Duncan	46-49
• Et år på vingene av Clement Bindel.....	50
• F2D Motor-seminar av Andre Bertelsen	51
• Västerås Open av Per Stjärnesund/Bengt-Olof Samuelsson	52
• Oktober-utmaningen av Ingemar Larsson	53
• November-kampen av Ingemar Larsson	54
• Hemma hos Snobbarna av Anders Hellsén	55
• Danska Tävlingar av Luis Petersen.....	56-57
• Preliminär tävlingskalender 2024	57
• LEJ 25 av Maris Dislers.....	58
• Diverse tävlingsresultat	59

• **On the cover:** This most beautiful Semi Scale Cessna GC-1 is built by Karl-Georg Krafft of Germany. Read more about this project on pages 20–21.



Italian F2B pilot Alberto Maggi.

FAI European Championships 2023



*British F2A pilots
Peter Halman and
Paul Eisner.*

This year's European Championships took place at the same place as last year's World Championships, namely Wloclawek in Poland. As a participant, you recognized yourself and knew where everything was and, moreover, it was the same organization and officials as the year before. They also started with a World Cup in all 4 classes. Apart from 2 days with a bit of bad weather, the majority of the contest days were good.

There was surprisingly low participation in both the World Cup and the Championship compared to previous years. The biggest reason is certainly that all costs such as entry fees, accommodation and travel have become significantly higher after the corona pandemic and it will probably not be any different in the coming years.

F2A had 15 participants in the World Cup and with each round more and more pilots crossed the 290 limit. After the last round, it turned out that half the starting field had passed 290, but that none had passed 300. The best at not passing 300 was Matthieu Perret FRA, who was only a few tenths ahead of Paul Eisner from GBR. When we turned into the EC then we saw flights over 300 and if you want to aim for a medal at a Championship nowadays you have to fly over 300. This time there were "only" 5 that reached it while another 11 came over 290 in the field of 27 pilots. Once again we saw Luca Grossi on top followed by two Hungarian pilots while the GBR stars took the 4th and 5th places.



Bulgarian F2C mechanic Yoana Ivanova.

F2B was the second largest class in the World Cup with 28 pilots while the Champs attracted 40 pilots. Both competitions were won by Mykola Turchenko from Ukraine who had a very nice model and also flew in a way that pleased the judges. Notable here is that the entire Slovakian team consisted of juniors. In the World Cup, all 4 made the top 9 while three of them went to the final flights in the Champ. Hats off for them! Could it be that Igor Burger, who was now sitting on the other side of the fence judging, could have taught them?

F2C was the class where the number did not differ as much between the World Cup and Champ compared to the other classes, 17 in the World Cup and 24 in the Champ. The World Cup saw no times under 3.10, while at the EC there was only one such time (3.09,9). However, it is incredibly close at the top where only tenths of a second separate the teams. To go to the semifinal at the EC, 3.20 was required and to make it for the final 3.13, while in the World Cup it was required around 3.30 and 3.19. It was the Ukrainian Makarenko team that won every competition but Makarenko/Marchuk in the World Cup and Makarenko/Osadchyi at the Euro Champ. The Surugue brothers from France who more or less subscribed to places in Championship finals in recent years came first in 7th place.

Polish F2C mechanic Julia Lesiuk.



Wloclawek Poland



Anthony Rostislavov and Jean Marc Aube helping their French colleague Matthieu Perret in the F2A circle.



Some pilots used contra-rotating propellers.



F2B model of Nikolay Turchenko UKR.

The Gold winning Spanish Combat Team of Raul Mateo, Jose Luis Lopez, Manuel Mateo and Xavier Segarra.



F2D was as usual the class that had the most participants at both the World Cup (34) and the Euro Champs (45), of which 10 were juniors and 5 were female (some were both). The strongest team came from Spain as they took 3 out of 4 Gold Medals and it was only Natasha from Denmark who won the Gold Medal for females. Raul has flown well and been highly placed in several Championships and now he finally got to stand at the top after defeating Natasha in the final. It was 1-1 in cuts but Raul won as he had full air time. Last year's World Champion Jussi Forss was third after losing to Raul in the semi-finals. Combat was also the class with the most number of nations, 14, while Stunt came close with 13.

From the Nordic countries, there were only pilots from Denmark and Finland and on the next page you find a summary of their efforts.

You find the results on page 59.

/Ingemar Larsson

The Opening Ceremony was held in the F2A circle.



Kimmo Valkonen, FIN.

R1: Loss to Gordon Price GBR. 2-3 and 402-498.
R2: Loss to Romeo Donchev BUL. 1-2 and 328-396.

Jussi Forss, FIN.

R1: Win over Sofija Rasteni's LTU. 2-1 and 556-484.
R2: Win over Ivan Chornyy UKR. 1-1 and 320-254.
R3: Win over Bjarne Schou DEN. 2-1 and 648-492.
R4: Loss to Raul Mateo ESP. 1-1 and 284-296.
R5: Win over Stanislav Chornyy UKR. 2-1 and 402-234.
R6: Win over Rafael Unruh GER. 1-0 and 458-272.
R7: Win over Natasha Dementieva DEN. 3-1 and 670-436.
R8: Loss to Raul Mateo ESP. 1-2 and 304-404.

Timo Forss, FIN.

R1: Win over Manuel Mateo ESP. 1-2 and 526-472.
R2: Win over Jonathan Crabtree GBR. 1-1 and 310-212.
R3: Loss to Pavel Kucera CZE. 0-1 and 172-248.
R4: Win over Leo Voss NED. 1-1 and 260-224.
R5: Win over Dave Wiseman GBR. Dq.
R6: Loss to Natasha Dementieva DEN. 0-2 and 414-466.

Andre Bertelsen, DEN.

R1: Loss to Rudi Königshofer AUT. 1-3 and 260-526.
R2: Win over Alexandr Dementiev MDA. 1-0 and 432-378.
R3: Loss to Vladimir Buyanov GER. 2-3 and 460-528.

Natasha Dementieva, DEN (F).

R1: Win over Armen Vardanyan ARM. Dq.
R2: Win over Audrius Rastenis LTU. 3-1 and 490-330.
R3: Win over Gordon Price GBR. 1-0 and 328-304.
R4: Win over Vytautas Rimša LTU. 2-1 and 416-350.
R5: Win over Sergey Khachatryan ARM. 1-1 and 366-326.
R6: Win over Timo Forss FIN. 2-0 and 466-414.
R7: Win over Jose Luis Lopez ESP. 2-1 and 680-186.
R8: Loss to Jussi Forss. 1-3 and 436-670.
R9: Loss to Raul Mateo ESP. 1-1 and 580-460.

Morten Fries Nielsen, DEN.

R1: Loss to Dave Wiseman GBR. 2-2 and 458-512.
R2: Win over Michail Vasilev BUL. 1-1 and 250-210.
R3: Win over Leo Voss NED. 1-0 and 420-384.
R4: Loss to Pavel Kucera CZE. 1-1 and 382-414.

Bjarne Schou, DEN.

R1: Win over Milan Kral CZE. 2-2 and 348-310.
R2: Loss to Xavier Riera FRA. 1-1 and 242-280.
R3: Loss to Jussi Forss FIN. 1-2 and 492-648.

Liv Munch, DEN (F, J).

R1: Loss to Pavel Kucera CZE, 0-3 and 270-736.
R2: Loss to Dave Wiseman GBR. 0-1 and 244-520.



F2B model of Frank Wadle GER.



F2C finalists Ihor Osadchyi/Volodymyr Makarenko UKR, Juan Barragan/Antonio Barragan ESP and Oleksii Igoshyn/Yuriy Chayka UKR.



F2D fight between Raul Mateo ESP and Igor Dementiev MDA in R1. Win for Raul with 2-1 in cuts.



F2D fight in R1 between Benoit Champain FRA and Vladimir Buyanov GER. It resulted in a 1-0 win for France!



F2C heat with Joanna Stoll POL, Volodymyr Alexandre Gauthier FRA and Jacco de Ridder NED.



Polish F2C mechanic Wojciech Lesiuk.



Polish F2C mechanic Bruno Rozbiewski.



Jussi Forss FIN and Sofija Rasten's LTU met in R1 in F2D. 2-1 in cuts and win for Jussi!

Weatherman Vintage Speed E1

At the end of 2021 after the great experience made in Weatherman Vintage Electric Speed classes E2.5 & E3.5 with my French friend Daniel Janan, we set up a new challenge to achieve a simple and small-sized Electric Weatherman while remaining in the spirit of the category without looking for pure performance or maximum speed, making it also achievable for beginner pilots. For this we have selected the E1 class (called E0 before 2022) with an motor comparable to the legendary Cox Tee Dee 0.049/0.051 for a speed of 100 to 110 km/h with batteries limited to 3S LiPo (which are commonly used).

The first step in this challenge was to establish a relationship between the Tee Dee motor and a possible electric motor. For this we have looked at the Tee Dee documentation to obtain its main technical characteristics, namely its maximum power and its operating RPM and we found it to be 0.105 BHP at 22,000 RPM.

The second step determines the electrical power of the motor considering the efficiencies of the motor and the ESC (Electronic Speed Controller) as well as its weight and dimensions. For the calculation of the power, we know that for small electric motors, their internal resistance (RiM) is relatively high compared to the motors used in F2G for example. This value of RiM will limit the performance of the motor. For this reason, we have taken an average efficiency of 75% for the conversion of mechanical power into electrical power.

- Mechanical power 0.049 Tee Dee = 0.105 BHP
- Electric power at the motor shaft:
 $746 \text{ W} * 0.105 \text{ BHP} = 78 \text{ W} = \text{approximately } 80 \text{ W}$
- Motor efficiency around 75%
- Electrical power of the motor in flight:
 $80 \text{ W} / 0.75 = 107 \text{ W} = \text{around } 110 \text{ W}$

The 110 W corresponding to the power consumed by the motor to deliver the mechanical 80 W to the propeller. To prevent the motor from overheating, we will look for a motor that can deliver between 180 W and 300 W.

Now we need to establish a possible weight comparable to the Tee Dee in order to respect the center of gravity of the plane and to allow us to choose a range of potential electrical motors. We know that the total weight of the Electric motorization GMP (Group Motor Power-train) will be heavier than the Glow solution by about 30% because the weight of the energy reserve is higher in electric than in Glow, however a good positioning of the battery will guarantee the center of gravity. Which gives us, Tee Dee 1.5 Ounce = 50 grams, plus tank, engine mounts, Glow pipe etc... about 60 to 70 grams



Which gives for an electric solution GMP, Motor plus ESC, Battery and cables about 80 – 90 grams. Consequently, a distribution of the following weights can be proposed:

- Motor: 25 to 35 grams
- Battery: 40 to 50 grams
- ESC and cables: 5-10 grams

To enter into the drawing at 75% scale, we need a motor with a maximum diameter of 32 mm. The third step is which ESC to use. For this we must determine what current we need to obtain the mechanical 80 W on the motor shaft. This value will be useful for sizing the ESC. We have calculated 110 W at the input of the motor, if we consider an efficiency of 80% for the ESC, cables and connectors, this gives us at the output of the battery the following electrical power:

- Battery output power:
 $110 \text{ W} / 0.80 = 137 \text{ W} = \text{approximately } 140 \text{ W}$

In CL speed, we are always on full throttle and we are straining the batteries a lot with high currents consumed, which limits the battery's output voltage because part of its initial voltage is absorbed by its internal resistance (RiB) as well as at its discharge voltage during the flight. From experience, we can use between 3.3 V and 3.5 V per cell under heavy load, which gives us the following calculation:

- Under 3S LiPo for $140 \text{ W} / (3 * 3.4 \text{ V}) = 13.7 \text{ A} = \text{around } 15 \text{ A}$

The fourth step, which batteries should we use? With a current of about 15 A it is recommended to use batteries with a C of about 30 which gives us $15 \text{ A} / 30 = 0.5 \text{ Ah} = 500 \text{ mAh}$. Now to limit the weight, we can use 400 mAh batteries which have a high discharge capacity like 70C or 80C. Second check, to fly at 100 km/h, there is the start followed by 6 timed laps plus 2 laps for fun, which gives 8 laps with the motor or about 22 seconds of motor and a consumption of approximately 90 mAh of capacity. The battery must be at least twice this value, i.e. around 200 mAh. With 350 mAh to 600 mAh we are OK.

The fifth step, we now have to determine the magic value of the motor kV coefficient and the possible propellers to achieve 100 km/h. The kV coefficient makes it possible to determine the nominal speed of rotation of the motor per Volt (V) of the battery. Unfortunately, this value is only valid with no load, without propeller, because it corresponds to the "back-electromotive force" of the motor and consequently, it is not valid under operating conditions where the real kV

Material Specifications:	Specification	
Crankcase: machine from light alloy bar stock	Displacement: .819 c.c. (.0499 cu. in.)	
Intake housing: injection moulded plastic	Bore: .406 in.	
Cylinder: mild steel (integral flw)	Stroke: .386 in.	
Cylinder head: turned from light alloy (integral glow element)	Bore/stroke ratio: 1.05	
Back cover: machined from solid.	Bare weight: 14 ounces	
Crankshaft: hardened steel	Max. power: 0.105 BHP at 22,000 r.p.m.	
Connecting rods: hardened steel (machined). Ball and socket little end	Max. torque: 3.3 ounce-inches at 19,000 r.p.m.	
Piston: hardened steel (hardened on walls only) flat top	Power rating: .128 B.H.P. per c.c.	
Propeller driver: steel screw and spinner (turned from light alloy)	Power/weight ratio: .07 B.H.P. per ounce	
Venturi intake: machined from light alloy		
Carburettor collar: light alloy (anodised gold)		
Needle: steel (spring ratchet)		
Propeller driver: machined from light alloy (anodised gold).		
Manufacturers: L. M. Cox Manufacturing Co., Box 476 Santa Ana, California, U.S.A.		
U.S. Retail Price: \$7.98. Price in G.B. 77s. 6d.		
British importers: A. A. Hales Ltd., Potters Bar, Middlesex.		
	Propeller R.P.M. Figures	
	<i>Propeller</i>	<i>R.P.M.</i>
	6 x 4 Top Flite nylon	14,500
	5 1/2 x 3 Top Flite nylon	21,000
	6 x 3 Top Flite nylon	18,400
	5 1/2 x 4 Top Flite nylon	18,200
	6 x 4 Davies-Charlton nylon	17,000
	5 1/2 x 3 Davies-Charlton nylon	24,000
	6 x 4 Frog nylon	15,800
	6 x 4 Stant	12,200
	6 x 3 Stant	14,400
	5 x 3 Keilcraft nylon	21,000
	5 x 4 Keilcraft nylon	19,800
	Fuel: 25 per cent. nitromethane, 20 per cent castor; 55 per cent. methanol.	

The new challenge for 2024!

Motor kV rating								
U Batterie :		3.5 U by Cell : 3.4		10.2 [V]				
Propeller speed efficiency :		0.75 [% /100]						
Motor RMP performance :		0.75 [% /100]						
Target Speed	Propeller 5.2 x 5.2		Propeller 5 x 5		Propeller 4.75 x 4.75		Propeller 4.75 x 4.5	
	Pitch	5.20	Pitch	5.00	Pitch	4.75	Pitch	4.50
km/h	RPM	kV	RPM	kV	RPM	kV	RPM	kV
100	16825	2199	17498	2287	18419	2408	19442	2541
110	18507	2419	19048	2516	20261	2648	21386	2796
115	19349	2529	20122	2630	21182	2769	22358	2923
120	20190	2639	20997	2745	22103	2889	23330	3050
125	21031	2749	21872	2859	23023	3010	24303	3177

This table shows that we can choose a motor kV between 2500 and 2750. In our case, we will choose, if possible, the upper range because the voltage is limited and it will be necessary to turn at high RPM to have speed.

will be lower because part of voltage will be consumed by the internal resistance of the motor RiM. Well, let's keep it simple it's just fun, we don't work for NASA, and anyway we'll have to use what's on the shelves... So let's go!

To move forward, we need to make some theoretical estimations on the performance of the motor and the propeller. Considering that we are still at full throttle, we can estimate that the motor rotation speed (RPM) will be 75% of the nominal value for its kV. We can also decide from experience that the propellers will operate with about 75% efficiency in pitch speed. Also consider that the battery voltage will be around 3.4V per cell under load as seen in step three. With these parameters, we can build a comparison table for several speeds and several propellers, of course the values will not be correct, however it gives a basis for work and starting point.

Finally, the estimated values give us the following set of parameters for a GMP comparable to a Tee Dee 0.049:

- Weight : 25 to 30 g
- kV : 2500 and 2700
- Diameter : 32mm
- Power : 180W to 300W
- Current : 15A
- ESC : 20-30A
- Batteries : 3S from 350 to 600 mAh
- Pitch propellers : 4.75 to 5.2

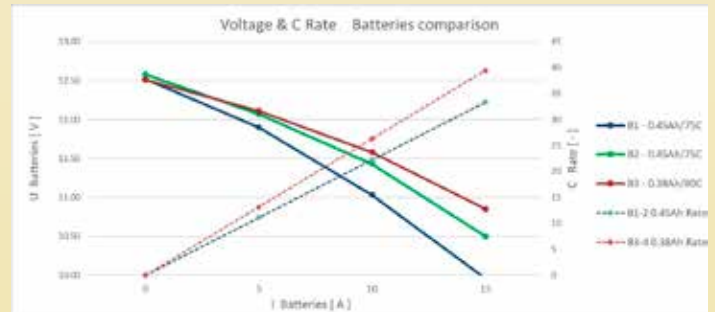
Motor found on the market: TURNINGY C2206 kV 2600, T-MOTOR and E-MAX.

Static test on the test bench			23.11
Setting for 116 km/h			
TURNINGY C2206			
kV	2600 RPM/V	3S	
Scale lever	0.02 m		
Scale value	293 gr		
Mechanical torque	0.057 Nm		
Average RPM	22300 rmp	2335	Rad/s
Mechanical shaft power	134 W (Meca)		
Voltage ESC	10.69 V		
Current Motor	18 A		
Electric power	195 W (Elec)		
Efficiency	69% Motor&ESC		

On these basis, concluded with Daniel Janan, we have set the following rules for the E1 Class:

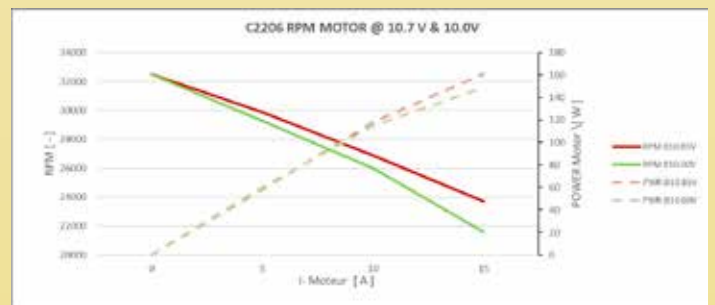
- Maximum motor weight 31 g (catalog indication or demonstrated, without connector)
- Max 3S battery
- Model weight 350 g max
- Run: 1/4 mile (0.402 km) – 6 laps

What results have we achieved in practice? The results we obtained in 2022 based on these estimates allowed us to start with speeds of 95 km/h which are well within the target. After a few tweaks and a battery change, we got speeds of 115-116 km/h at top speed, using a 5 x 5 propeller and a very good battery, represented by the red curves in the graphs below. The in-flight power was estimated at 170 W from the energy consumed during the flight. There is still a margin of work but we gently arrive at the maximum without changing the motor or the batteries.



Technically we got measurement of the Turnigy C2206-2600 kV motor that gives an internal resistance of 0.059 Ohm and a kV of 2600. A static test measurement of the motor with the ESC gave us a value of 69% for the global efficiency, which is close to the estimated values in calculations.

The battery performance measurements give us the following graphs for three different batteries. It is clear that it is important to find the correct batteries that allow a maximum voltage under load at 30 or 40 C, for 15 A or more! On the graph we can see 0.8 V difference at 15 A between two batteries, which is huge and explains why we have gone from 95 -100 km/h to more than 110 km/h.



A simulation of motor RPM performance versus battery also shows that RPMs are strongly influenced by the power demanded (propeller charge) and also by the battery used. Here too we note that it is necessary to aim for the best battery to reduce the current in the motor and improve its global performance/efficiency.

Finally using some magic equations that we will not approach in this article because they go out of the field, it is possible to draw two interesting curves and which summarize this article between the flight speed, the electric power and the RPM of the motor. We can read there what theoretical power for a desired flight speed and what motor RPM we will have for "the" simulated motor and plane.



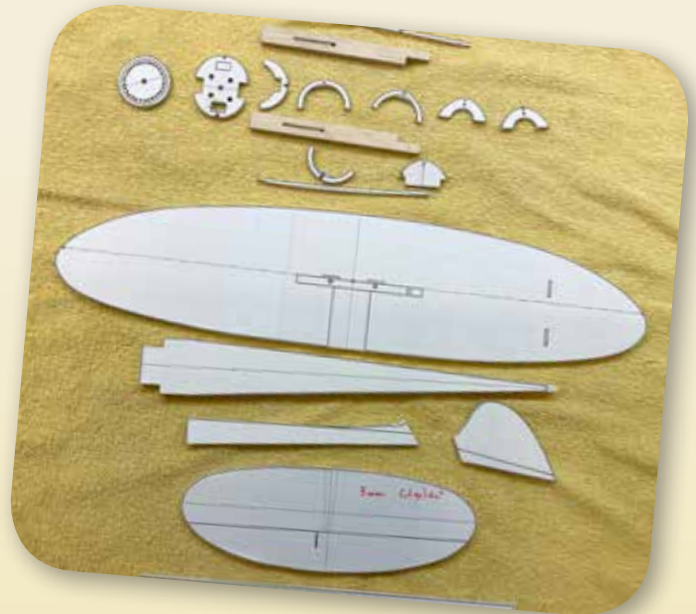
Conclusion, even if the E1 plane remains modest and the technology used is available in specialized shops, it is perfectly possible to have fun and rack your brains with these pretty planes. What should be remembered from this article is that speed is power and that electric motors do not always run at the same RPM, therefore the choice of battery and propeller are essential to the final performance, nothing is simple.

All your comments are welcome, I had a lot of fun writing this article on such a vast subject, I hope I have been simple and have been able to provide some answers to your questions. Thank you for your interest in electric motorization. Looking forward to see you in the circle soon.

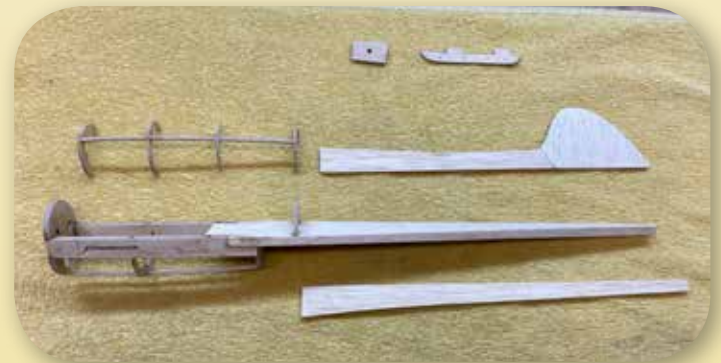
For the ones that like to read standards you find more here: ISBN 978-2-9556952-0-3 Pages: 133 to 138. (In French!!!)

I will end this article by some photos of how to build the model and adapt a Weatherman for electrical power.

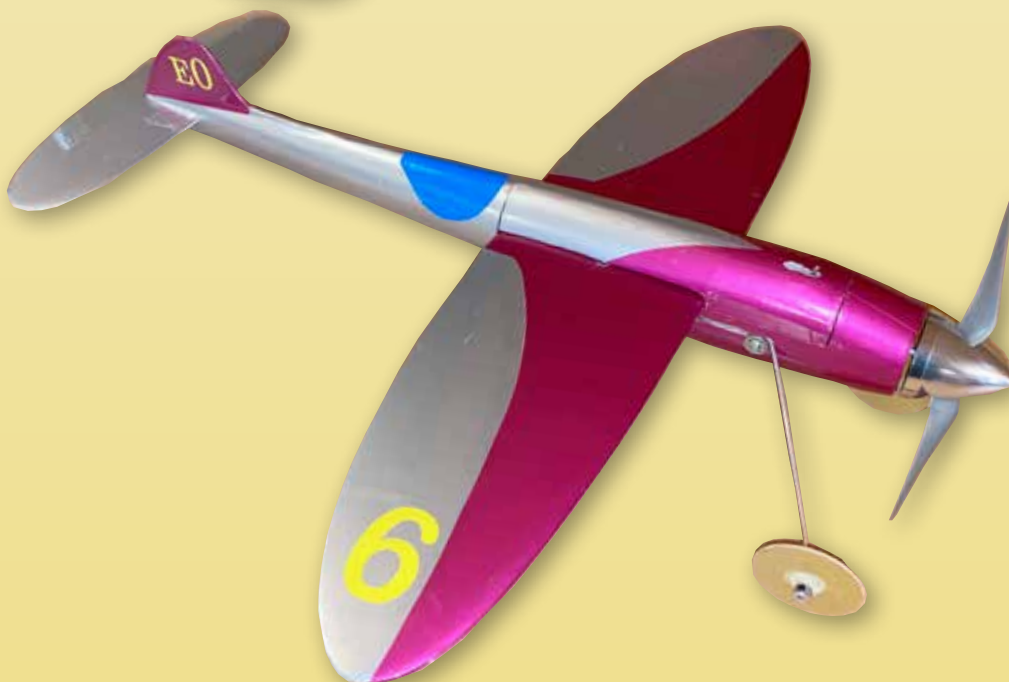
Daniel Rota
SUI



It is always a good idea to make templates of the parts needed for the model. One way is to have self-adhesive templates printed from the plan which are placed on the pieces to be cut.



Construction of the fuselage.



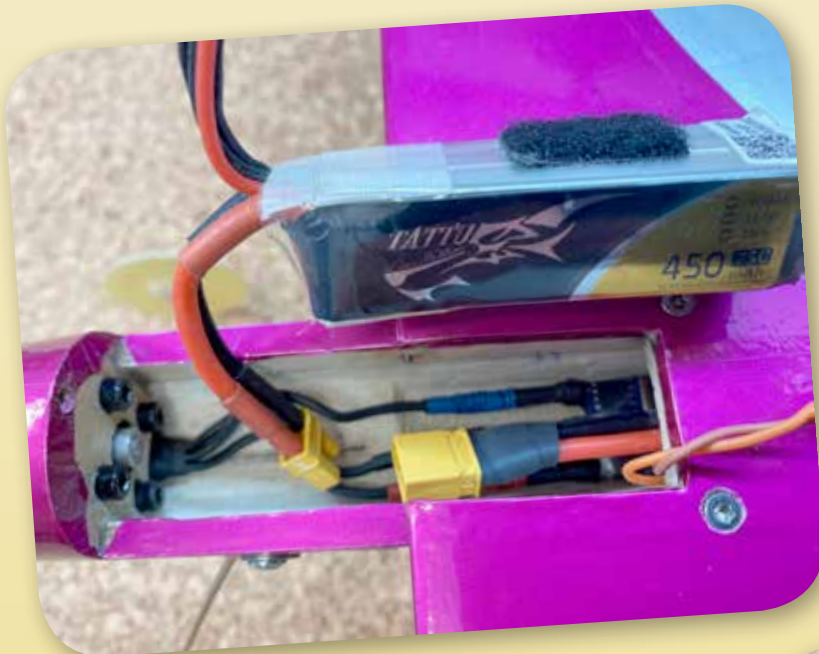
The model is now ready to fly!



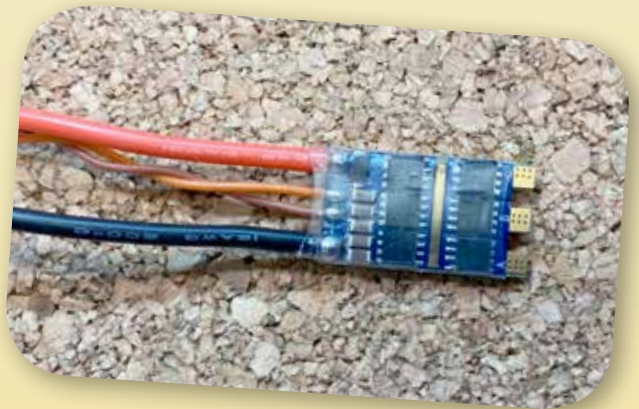
The skeleton of the fuselage glued together. It is always necessary to build light!



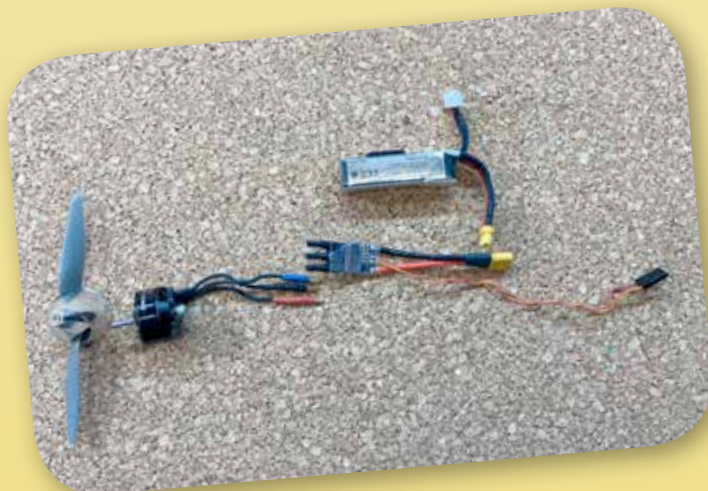
Engine and spinner. Note that spinner must stay within the dimensions specified in the rules for class 1.



The battery compartment.



The ESC Circuit from Drone Equipment; TURNIGY 33A.



All electrical parts needed. Note that the motor is equipped with connectors to allow easy disassembly.



Parts ready to be mounted in model.



SM I LINFLYG 2023



Lennart Nord och Johan Larsson gjorde upp om SM-guldet i två finaler.

Årets SM blev tyvärr lite stympt då vi bara kunde köra tre klasser istället för de sedvanliga fyra. F2C Team Racing fick ställas in då de påtänkta deltagarna av flera olika skäl fick lämna återbud. Vi får hoppas att alla är i sådan form att de kan delta nästa år.

Om man ska se något positivt på detta var det väl att det fanns mer tid för de andra klasserna plus att vi kunde ha prisutdelningen lite tidigare på söndagen. Och att F2B Stunt fick göra alla sina flygningar i asfaltcirkeln. När sedan F2D Combat kördes klart på lördagen öppnade det för stunt-träning i gräscirkeln.

F2A Speed

F2A hade 6 piloter anmälda varav 5 kom till start. Tävlingen var i år en mer öppen affär än vanligt eftersom vår nästan ständige mästare Per Stjärnesund fortfarande gick på rehab för sitt vid påsken skadade ben. Fast man måste nog säga att första omgångens resultat inte fick nackhåren att resa sig på publikum då endast Bengt-Olof och Ola fick tider. Lyckligtvis för dessa

två var detta det enda de åstadkom och det skulle räcka till guld och silver. Bronset säkrade Uffe Nygren i omgång två genom att nå 215 km/h medan de övriga två kandidaterna inte kom över 200 km/h. Så man kanske skulle kunna säga att det är dags för våra kära speedflygare att ordna ett eller flera träningsläger. Det är mycket trevligt och givande (Se Lina 1-2023 sidan 4-5)!

F2B Stunt

Veckan innan 26-27 augusti tittades det väldigt mycket i väderapparna. Regn, åska och vind. Prognosen ändrades hela tiden och dagen innan tävlingen såg det fortfarande inte bra ut. När lördagen kom så hade vädergudarna förbarmat sig över oss. Det blev faktiskt helt okej väder för flygning. Söndagen bjöd på sol till och med.

Efter två omgångar på lördagen ledde Staffan tätt följd av Niklas. Anders låg på tredje plats och undertecknad på fjärde. Christian på femte och Johan på sjätte. Thomas Olsson som flög F2B på SM för första gången låg sju. I sin andra flygning blev Lennart

Nord diskad för en tappade stabbhalva och låg åtta. Lennart hade glömt sättta i en skruv i stabben på sin helt demonterbara modell.

Inför söndagens flygningar var spänningen på topp. Skulle placeringarna från lördagen stå sig? Thomas Olsson hade otur och gick i backen så poängen blev inte så höga. Han blev åttonde man. Sjuan Johan har nog en för liten modell för att få till poängen som krävs för att slåss i toppen. Han kan ju flyga. Christian börjar få till poängen och slutade sexa. Undertecknad blev nerpetad ett streck, femte plats. Fjärde plats tog Anders då han hade lite problem med att få riktigt drag i motorn. När han får det så kan han nog ge Staffan, Niklas och Lennart en match.

Lennart som skruvat ihop sitt flygplan väldigt grundligt inför söndagens flygning fick bronsmedaljen. Hur skulle det gå i matchen mellan Staffan och Niklas? Det var spännande, alla väntade på att resultatet skulle komma upp. Till slut efter räknandet stod Niklas för första gången som svensk mästare. Stort grattis till honom.



Johan Rasmussen flyger F2B stunt igen! Han har monterat gurney flaps på sin modell vilket märkbart förbättrat flygegenskaperna.



Stuntflygarna tjänstgjorde som vanligt som klipprännare och tidtagare i Combaten.



Bengt-Olof och Mart hjälper Ulf.



Ove Andersson visade en fin byggsats i "Mint condition" av Veron Combateer som snabbt fick en ny ägare.



Som vanligt var det en avspänd och gemyttlig stämning i F2B-depån.

F2D Combat

Bara 4 piloter i F2D men tillräckligt antal för att få dela ut SM-medaljer. Glädjande vara att se Gustav Od tillbaka i pilotcirkeln efter några års frånvaro. Då både han och Lennart tävlar för Västerås blev det så att de fick möta Bernt och Johan i tur och ordning. Och några klipp blev det. Först fick Lennart 2-0 och seger mot Bernt och sedan ville ju inte Johan vara sämre och vann över Gustav med 2-0. I omgång två fortsatte det när Johan och Lennart möttes i ett heat som slutade 2-1 i Johans favör. Gustav startade bakåt i sitt heat mot Bernt, blev diskad och var ute ur tävlingen. När sedan Johan och Bernt fick mötas i tredje omgången blev det "bara" ett klipp för Johan men det räckte för seger. Vilket öppnade för en eller två finalflygningar mellan Lennart och Johan (den senare var utan förlust). I första drabbningen blev det 2-1 till Lennart så det var bara att ladda om för final nr två. Där blev det 1-0 till Johan vilket innebar guld för Johan (har ingen koll på hur många det är nu men ett antal är det!). Och Lennart fick sitt femti-elfte silver.

Lördagkvällen tillbringades i Flygklubbens lokaler där Kaj & co ordnat god mat som intogs tillsammans med mycket modellprat. Tyvärr uteblev karaoke även i år ...

Att Västerås skulle vinna Lag-SM var knappast någon högoddsare och tack vare L-Niklas seger i F2B samt K-Niklas deltagande i F2A gick silvret till Karlskoga. De övriga 8 deltagande klubbarna var så kallade "one-man-shows" och Staffans silver i en klass med fler deltagare gjorde att Trelleborg fick bronset framför Vänersborg. För 2024 lanserar vi mottot: "Mer deltagare på SM!"

Ingemar Larsson och Michael Palm



Thomas Olsson premiärtävlade i F2B under detta SM. Han flög med en Pysclone designad av Steve Buso. I nosen sitter en Retro Discovery.



Mart Sakalov Västerås FK gjorde 165,1 km/h i fjärde omgången. Det räckte tyvärr inte till någon pallplats den här gången.



De glada SM-medaljörerna.

F2A: Ulf Nygren, Bengt-Olof

Samuelsson och Ola Murelius

F2B: Lennart Nord, Niklas Löfroth

och Staffan Ekström

F2D: Bernt Gustavsson, Johan

Larsson och Lennart Nord

RESULTAT SVENSKA MÄSTERSKAPEN 2023 Johannisberg, Västerås 26-27 augusti

F2A Speed

Placering, Namn	Klubb	1	2	3	4
1. B-O Samuelsson	Västerås FK Modell	269,6	0	0	0
2. Ola Murelius	Västerås FK Modell	230,6	0	0	0
3. Ulf Nygren	Västerås FK Modell	0	215,1	0	0
4. Mart Sakalov	Västerås FK Modell	0	156,0	0	165,1
5. Niklas Karlsson	Karlskoga MFK	0	136,4	0	0
6. Jan Gustafsson	Västerås FK Modell	0	0	0	0

F2B Stunt

Placering, Namn	Klubb	1	2	3	2 bästa
1. Niklas Löfroth	Karlskoga MFK	1017	1049	1055	2104
2. Staffan Ekström	Trelleborgs MFK	1037	1052	1034	2089
3. Lennart Nord	Västerås FK Modell	984	0	998	1982
4. Anders Hellsén	MFK Snobben	954	905	963	1917
5. Michael Palm	Kungsbacka MFK	884	926	934	1860
6. Christian Johansson	Västerviks MFK	842	897	912	1809
7. Johan Rasmussen	Vallentuna MFK	762	774	780	1554
8. Thomas Olsson	Trollhättans MFK	700	487	14	1187

F2D Combat

Placering, Namn	Klubb	Omg 1	Omg 2	Omg 3	Omg 4	Omg 5
1. Johan Larsson	Vänersborgs MFK	2 V (680)	3 V (680)	5 V (580)	6 F (448)	7 V (276)
2. Lennart Nord	Västerås FK Modell	1 V (680)	3 F (560)	6 V (548)	7 F (236)	
3. Bernt Gustavsson	LEN	1 F (278)	4 V (-)		5 F (152)	
4. Gustav Od	Västerås FK Modell	2 F (474)	4 F (Disk)			

Lag-SM

Placering, Klubb	F2A	F2B	F2D	Summa
1. Västerås FK Modell	5+4+3+2	6	4+2	26
2. Karlskoga MFK	1	8	-	9
3. Trelleborgs MFK	-	7	-	7
4. Vänersborgs MFK	-	-	5	5
MFK Snobben	-	5	-	5
6. Kungsbacka MFK	-	4	-	4
7. LEN	-	-	3	3
Västerviks MFK	-	3	-	3
9. Vallentuna MFK	-	2	-	2
10. Trollhättans MFK	-	1	-	1

Domare

F2A	Ove Kjellberg
F2B:	Johan Larsson, Stefan Karlsson, Ingemar Larsson
F2D:	Stefan Karlsson / Bengt-Olof Samuelsson

Pappersklädsel av modeller

I den här artikeln ska vi beskriva hur man arbetar med pappersklädsel och då främst japanpapper. Esaki och Asuka är bra sorter av vad vi kallar japanpapper. Utmärkande egenskaper är att de är föredömligt våtstarka, och att de inte har någon påtaglig fiberriktning. Esaki har gått ur produktion, men kan finnas kvar i lager hos enstaka firmor.

Om man har ytor som ska vara täta är det olämpligt att använda papper i de allra lättaste viktklasserna. Håller man sådant papper mot ljuset så ser man att det finns "mistor" (alltså ställen utan papper alls – vi kan kalla detta små hål) och från dessa kan klädseln lättare rispa upp vid t ex landning. Hålen väger förvisso inget men tillför heller inte mer än en skörare klädsel.

För t ex stripes och nuffror vilka skall fästas på en redan klädd yta fungerar "silkepapper" bra. Dessa finns ju inte bara i massa färger utan även med mönster. Bra sortiment av dessa mycket tunna papper brukar man hitta i "pysselaffärer" men man ska vara medveten om att dessa papper är rätt sköra och våta blir de helt kass.

För övrigt finns många färger och flera viktklasser. De tjockare varianterna av Esaki tar upp mycket lack och blir tunga. Det finns även icke cellulosabaserat "papper", polyesterpapper, som förvisso har en tydlig fiberriktning men är starkt som sidan. Detta fäster man med lack men man sträcker med värme som "strykjärnsfilm" och det blir otroligt starkt. Papper i olika kvalitéer finns att köpa från flera ställen, bl a MBS, 3F och FreeFlightSupplies.

Innan man börjar klä måste man göra ett noggrant underarbete. Alla "kantigheter" och uppstickande hörn, limklickar mm måste slipas ner för att inte störa klädseln. Mellan varje lager av lack på den yta som ska kläs måste man slipa lätt med ett fint papper (typ 500). För lätta modeller räcker det med 2 lager annars 3 lager. Ytan behöver inte bli blank utan huvudsaken är att den är "mättad". Lacka bara de ytor som kommer att få kontakt med papperet.

När strukturen är lackad enligt ovan, fästs pappret genom att aceton väts genom pappret med en smal pensel. Innan acetonen hinner avdunsta, stryk med ett mycket lätt finger, så att pappret fäster. Men (OBS) fäst enbart runt ytterkonturen.....inte spryglarna. Om man använder tjockt eller tunt papper vid klädseln beror på modellens storlek och vikt. Om fiberriktning finns, skall den ligga längs vingen ("span-wise") eller längs kroppens longeronger.

Tittar man på papper i motljus så syns tydligt att ena sidan är blank medan andra sidan litet mattare. Vad detta har för betydelse är svårt att säga, men teorin är att med matta sidan inåt så fäster pappret starkare mot balsalisterna och med den blanka utsidan behöver man aningen mindre lack. För Polyesterpapper är skillnaden mellan sidornas glans mycket stor.



Julio Isidro har köpt rutmönstrat papper till sin modell.



Harry Kolberg låter papper av olika färger mötas på sin W-modell.

Zaponlack går bra, men man kan också använda vanlig nitratdope. Förr var Zaponlack vanligast då den var tillgänglig hos den lokale färg-handlaren, medan tillgången på nitratdope var dålig, vilket nu inte är fallet. Enligt många är dock "riktig" nitratdope ett strå vassare än Zaponlack.... Nitratdope finns t ex hos Arigo Teknik.

Dopen (eller Zaponlacken) skall spädas åtminstone 50/50. När man späder sin cellulosalack kan man använda aceton om man applicera med spruta. Men skall man använda pensel är cellulosa-förtunning avsevärt bättre då den inte ger så extremt snabb torkning som med aceton. Ta inte hustruns aceton för nagellack för den innehåller olja.

Riktigt små, lätta modeller bör kläs torrt, med påföljande vattenspanning. Men spraya vattnet med mätta, så att det inte blir "plaskvätt". I känsliga fall kan man hålla delen över en kastrull med kokande vatten, så att pappret bara får litet ånga att absorbera. Somliga blandar sträckvattnet med sprit, för att få litet "snällare" krympning.

Medan vattenspanningen pågår (dvs torkar), skall vingen sitta fixerad vid en plan bräda, för att undvika att det slår sig. Normalt brukar man låta det vattenspända sitta i fixerat läge över natt, allra helst ett dygn.

En balsayta klär man "torrt" eftersom balsaflock kan deformeras av vatten. Fäst med aceton som beskrivits, men här bör man använda en bred pensel för att kunna jobba snabbt. En acetonfuktad trasa kan också vara ett bra hjälpmedel här.

I en sprygelbyggd vinge kan klädseln slakna när luftfuktigheten ökar (precis som sidenklädda dito) och detta kan i viss mån motverkas genom att man "tillsätter en droppe ricinolja" när man späder sin lack. Ricinoljan mildrar även sträckkraften i spännlack. Tänk på att spännlack behöver rätt lång tid att "spänna färdigt". Alltså ... räkna med några år allra minst. Därför måste man lägga lika mycket på under- som över-sidan, annars kommer det att bli skevt med tiden.

Efter vattenspanningen, dopa med samma 50/50-dope. Två gånger räcker för en liten lätt modell, några gånger till för större modeller. Det är nu som papperet slutligen fästs mot spryglarna när klädseln blöts av dopen och man ska helst spänna fast känsliga strukturer mot plant underlag mellan varje lackning och gärna låta sitta i spänn ytterligare några dagar efter den sista behandlingen. För en vinge ska man helst lacka båda sidor samtidigt och sedan sätta i spänn.

Från Deluxe Materials kommer Eze Dope. Denna är en vattenbaserad emulsion som har kraftig spännverkan. Här måste man prova sig fram på det papper man använder. Jämfört med cellulostatyperna av spännande lack så verkar denna inte fortsätta spänna i flera år efteråt. Ytterligare ytbehandling är frivillig men om modellen skall drivas med glödsticksmotor krävs bränsleskydd av något slag. Även för dieselbränsle med nitrat krävs någon form av ytbehandling.

Om man får blåsor eller veck i klädseln så väter man med aceton så att det lossnar, lyfter upp klädseln och stryker det tillräta med den breda penseln.

Japanpapper kan vara svårhanterligt när man vill skära till smala stripes och fästa på modellen. Knepet är att fästa en bit papper i en ram, vattenspanna och lacka en eller två gånger. För enkelhetens skull sprejar man lack på båda sidor så fäster pappret lika bra oavsett vilken sida man har neråt. Nu har pappret fått tillräcklig styvhet för att kunna skäras med t ex en linjal. Vass skalpell rekommenderas. Skall man skära bokstäver och siffror från svart eller väldigt mörkt papper kan man rita med vit penna. Om man använder Panduros penna "GELLY ROLL o8", Sakura Japan (som ger smala linjer) så kan man efter att skurit eller klippt färdigt peta bort den vita linjen. Stripes lackas helt enkelt fast på underlaget och smala stripes brukar gå att lägga i kurvor när de är mättade med lack.

Om man vill ha en fin skarv mellan olikfärgade papper kan man lägga lagren omlott och göra ett snitt med skalpell, väta med aceton så att papperet går att lyfta och sedan försiktigt dra bort den underliggande biten. Men detta kräver lite övning för att bli fint. Använder man skalpell är det viktigt att hålla den vass, t ex med ett diamantbryne då papper sliter hårt på skärpan. Man kan också använda sax eller skalpell för att klippa ut lämpliga bitar. Om man har olika färger är det oftast klokt att ha den ljusa kulören underst och den mörkare ovanpå.

När öppna strukturer kläs, måste man alltid tänka i termer av "enkelkrökta" ytor, för att inte få rynkor. Vingspetsar t ex bör kläs separat, med en egen bit papper. När papperet skall "vikas" runt en rundad kant, går det bra att dela upp sträckan i kortare snitt, och sedan "massera" papperet runt kanten, bit för bit. Vid välvda och rundade helbalsakonstruktioner kan papperet "i någon mån" masseras runt en dubbelkrökt yta, dock inte hur mycket som helst. När gränsen är nådd, får man snitta upp papperet för att kunna gå vidare.

Istället för att lacka sin balsastomme, vilket är väldigt tråkigt och tidsödande, kan man använda limstift, t ex UHU Limstift som finns i att få i många affärer. Metoden kräver en del övning men går till så att man stryker på limstift direkt på det slipade men i övrigt obehandlade träet. Det får torka en stund. Sedan lägger man på sitt papper och fäster med pensel doppad i T-sprit.

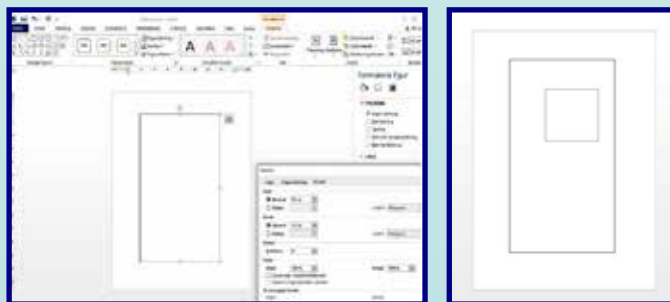
Tissue Paste från DeLuxModels är ett sätt att klä om man klarar att kladda på denna pasta så snabbt att det inte börjar torka. Flaskan har en skruvpip som stänger när man vrider på pipen – denna är tillräckligt bra för att applicera TP direkt ur flaskan till träet. Allra bäst är att ge ytorna som skall kläs en behandling med någon form av spädd lack vilket förlänger TP's torktid en aning. Att fästa med TP kräver en del övning och TP'n biter hårt direkt och då pappret blir blött av TP som är vattenbaserat så måste det komma rätt på första försöket. Spantbyggen med longeroner och måttskurna remsor blir mycket bra. Man märker snart att en stor våt frottéhanduk som man ofta kan torka fingrar och händer på istället för på byxorna underlättar – TP har ett otroligt bra klister och får man det fingrarna så kommer allt man tar på att fastna. Både Limstift och TP tål vatten någorlunda och klädseln ska vattenspannas.

/Bo Jansson
Med hjälp av Ingvar Nilsson
och Ingemar Larsson



Här låter Julio ljusst och mörkt papper mötas på vingen.

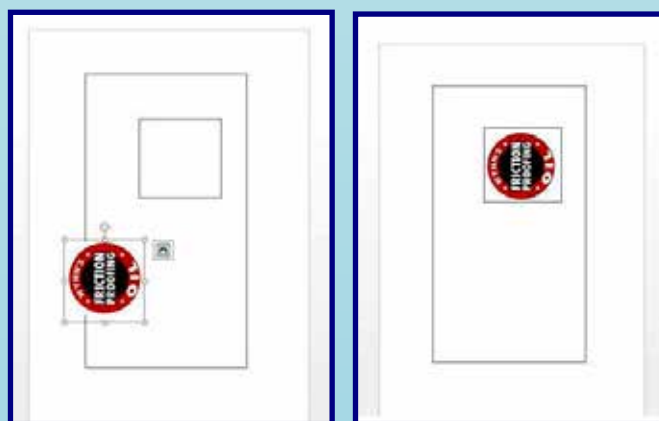
Eget tryck på papper



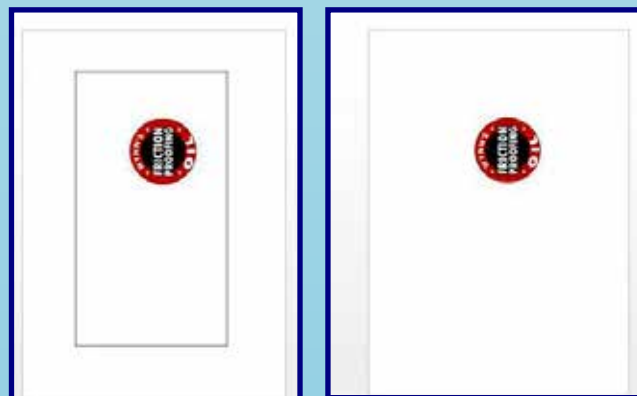
Med lite pyssel kan man själv skapa sina egna mönster eller text på japanpapper. Det finns flera program man kan använda och här beskrivs hur man gör det i MS Word. Beskrivningen som kommer gäller utskrift på bläckstråleskrivare men går säkert att göra på laserskrivare också. Tänk på att olika bläck tål lack olika. Utskrifterna från Canon tål lack men inte vatten utom den svarta som tål både och. Testa vad som gäller för det Du använder. Tveksamt om laser funkar.

När man bestämt hur stort japanpappersarket ska vara använder man "Infoga" --> "Figur" och anger storlek och placering i dokumentet. I exemplet är storleken 22 x 12 cm. Skriv nu ut det här arket. Det ska senare bli Ditt underlagspapper.

För motivets position använder man "Infoga" --> "Figur" på det markerade arket och lägger rutan på önskad plats.



Sedan väljer man "Infoga" --> "Bilder" och hämtar in motivet från sitt bildbibliotek. Anpassa bilden i storlek så att den passar i positionsrutan. Lägg sedan motivet på plats.



Ta sedan bort hjälpramen runt bilden. Ta också bort den yttre hjälpramen. Nu är bilden klar för utskrift. Ta nu fram arket med den utskrivna papperspositionen och klipp till en bit japanpapper så att det passar i hjälpramen. Tejpa sedan fast runt alla fyra sidorna. Gör detta på en plan yta och se till att japanpapperet ligger plant, snyggt, skrynkelfritt och inte har någon luft under sig. Man kan använda en linjal som tyngd när man tejpar. När detta är gjort stoppar man arket i skrivaren och skriver ut. OBS! Stoppa i papperet åt rätt håll!



Japanpapperet tejpas på det tidigare utskrivna underlagsarket, där man också ser hjälpramen genom papperet.



Låt det utskrivna arket torka ordentligt (till nästa dag) innan det utsätts för lack, aceton och annat.



Exempel på utskrivna dekaler.



Ska man klä t ex en fena kan man med fördel spänna fast utskriften på en ram för att underlätta fastsättningen.



Slutresultatet på denna Vespa kan ju inte bli bättre!

Infärgning av papper



Denna beskrivning avser Herdins Bets (vattenlöslig i pulverform). Koka upp vatten och blanda koncentrat enligt instruktionen på påsen.



Här är vi redo att börja testa olika blandningar/spädningar. Pensla på små bitar av det japanpapper Du skall använda och tänk på att färgtonen ändras när det torkar. Snabbtorka med varmluftspistol. Tänk också på att färgtonen blir olika på öppna strukturer jämfört med om det ligger på balsa.



Häng upp arket över en hink och spraya färgblandningen med en blomspruta. Papperet ska bli riktigt genomblött för att få en jämn infärgning. Överskottet rinner ner i hinken och kan användas igen. Låt papperet hänga kvar tills det slutat droppa.



Fäst det våta papperet i en ram och låt det spännas genom torkningen. Man kan använda varmluftspistol om man har bråttom. Sedan är det klart för användning. Här ses också en testbit på ett balsafлак.

An essay from the Lincolnshire plain

And just like that - it's early December - the year has gotten away from us all again !

I remember, in the hazy days of that brief 'blip' that was the summer of 2023, between the hours of (only kidding), but it really does feel like that doesn't it ?! We've seen the autumn out, even Halloween and bonfire night have scuttled past, left their familiar sounds and smells and we're looking down the barrel of another Christmas - I've even heard Noddy Holder with his band 'Slade' belting out his rallying call - 'look to the future now, it's only just begunnnnnnn' !

Bonkers!

That's just it though isn't it - it's easy to dismiss what goes on before our eyes - the normal, run-of-the-mill goings on that make up our flying calendar - but when you really do look closely, we're all making history - and some of it is even recorded for us to enjoy later. . . . (much later Stephen!), and appreciate what we have amongst us in the collective enjoyment of control line aerobatic flying.

So, I invite you all to cast your nitro-soaked minds back to late August, the CLAPA Champs have been squared away - our Home International joyously concluded with our Irish brethren - and a good few centralised competitions, club competitions completed without too much disruption - and the NATS are here !

Still a little subdued, being as they are separated now into their constituent parts - we make the best of it, not too much of a chore when the location is as well presented as our National Flying Centre at Buckminster. I know it sounds a little sycophantic, but it really does just keep getting better, more refined and is quickly becoming the ideal location for pretty much any model flying discipline - a triumph of tenacity, dedication and outright love for our sport - well done Manny and your team, and thank you.

On a personal note - I was keen to arrive early the day before competition, in the hope of reacquainting myself with my love of flying IC control line aerobatics and the Yatsenko Classic model. After immersing myself completely in the world of electric power for a good few years (culminating in flying one of the most impressively constructed model aeroplanes and with equally impressive flying characteristics I've ever seen, the 'Starlight' built by Vasily Astrakharchik), I have been lucky enough to return to smelling of methanol, feeling the faint buzz down the lines from the engine and hearing that engine note that evokes such fond memories, satisfaction and connection that I felt was missing with electric powered control line flying.

For all it's apparent advantages, I just couldn't find the right amount of enjoyment in my flying without the involvement of mixing fuel, looking after glow plugs, fine tuning props, checking filters, engine run times, lap speeds, 4/2/4 break points - even the ritual



of cleaning down after each flight and after each day on the field - I missed it too much. Whether it's a firmly rooted memory from watching my dearly departed Dad doing the exact same thing every Sunday as a boy, or if it's because I find peace in the ritual, the meticulous preparation, execution and conclusion of carefully looking after an engine and airframe. . . . we could go on at length. . . what I do know is; I'm heartily glad I'm back, oily cloth in hand, beaming from within.

That's just it isn't it - if we are here of our own volition, if we can choose to control anything at all, we surely must choose to enjoy this, we are all here to enjoy this - our passion for our sport, the thrill of competition, whether against yourself or each other, the knowledge gained and the wisdom given, camaraderie and the occasional calamity - it all goes together to make a wonderfully rich environment - let's hope we can ensure it's longevity and pass this enthusiasm to another generation of pilots - flying electric or otherwise !

One thing that we seemingly can't control that much - is the British weather! It's been a pretty difficult year for flying, most competitions suffering some poor conditions, two events outright abandoned - across weekends - even single days, the conditions have been variable (note to self - remove the dang polarising filter on the camera Stephen, the light changed so fast, so many times this year!), so arriving the day before to get some practice in was more pertinent than ever.

The campsite at Buckminster was a-buzz with competitors leaving from the previous event and control line competitors eagerly filling the gaps, ready to encamp - ready to compete, ready to race, chase streamers and carve patterns on their own hemispheres - making the best of the NATS as we now know it. Memories of times past are just that - we have our own missions ahead, our own memories to make, time to get cracking.

Against the backdrop of the Leicestershire (or is it Lincolnshire?!), countryside the familiar see-saw sound of F2B, the slightly erratic and insistent fizz and scream of F2D and the almost hypnotic swinging sounds of F2C filled the air as I pitched my tent and put together the beautiful Yatsenko Classic, powered by an equally beautiful Profi-Discovery Retro '61 - perfect. A few flights in, and I'm ready to go, feeling like I've never been away, feeling that connection - the commonality between us all in the control line world - you can feel it, you're a part of it.

By late afternoon, early evening, most competitors have arrived, the CD for the event - Mr Alan Watson has the scoring tent in full readiness for the weekend ahead, and even the circles are marked out with the newly acquired white-line marker, it's all looking rather good, even the weather appears to have got the memo and is graciously subdued - a perfect British summer prelude.....

Competitor numbers have held pretty much steady for the last few years, I dearly hope we can build on this - much is made on the subject of maintaining numbers and attracting newcomers (perhaps another conversation, for another article/time), I'm always keen to learn as much as I can from the current cohort, a vast array of knowledge and experience that stretches back farther than I care/dare to think. If we are to secure continued support for control line flying, we must surely at least be positive and willing to extol the virtues of our sport and invite others to see what it is we actually get up to and go on about all the time!

Keep going!

Flying qualification for f2b followed the UK NATS format of 2 flights in 2 circles over the first 2 days, with Classic, Vintage and the new Clubman Class following, the f2b fly-off conducted on the third day. Judges this year comprised of Mr Roger Ladds, Mr Ken Reeves, Mr Alan Watson, Mr John Ash and Mr Dave Underwood - where would we be without their dedication, skill and determination to hold concentration and bladder with equal fortitude!

The first day of flying was under way - the immediate cacophony of engine noise at 10:00hrs never fails to amuse - happily, the days flying is conducted without incident, only enjoyment - looking over the site at the mix of activities, the sounds, smells and spectacle that makes the NATS what it is, was just wonderful - if only there was more of it!

Day two greets us with a keen breeze, building heat and humidity. . . . engine settings changing, air changing. . . . then no wind. .

. . . a thermal passing through, cloud cover, then full sun, wind direction changes and then those 'lumps' of lift and sink that take you by surprise - all part of the adventure when you're pulling out at 5 foot from the floor in a British summer - "can't take a joke, shouldn't have joined."

Meanwhile - over in the field adjacent to the main runway at Buckminster, as the hay was being spread in the field to dry in the sun by the farmer, a funnel of warm air whipped up the hay into a perfect tornado shape, some 100 feet or more - I was lucky enough to catch it on camera - just as it began to dissipate, the hair stood up on my neck. I felt a sudden warmth in the air and before I could turn my camera back on - 4 aircraft in the pits, ready to fly, were effortlessly picked up to at least eye level, flipped over and slammed to the floor, this was no joke - I didn't join for this, for sure. Unfortunately, two of the aircraft sustained damage - Mark Williams' Dago Red fairing the worst with a cracked rear fuselage, and fin unceremoniously removed, Glen Alison's Yatsenko Classic suffering some puncture wounds but otherwise structurally sound.

We were all too stunned to do anything about it at the time, let alone take pictures - so you'll have to take my word for it! I went for a walk to catch the remainder of some of the combat and watch some of the racing on the hard circle - gather my thoughts and wait for the scores and look forward to watching the completion of the Classic, Vintage and Clubman competition flying.

Classic was a pleasure to watch, I'm super keen to join in next year - I might have to source an airframe from somebody whilst I decide on what to build in my ever decreasing 'spare time' - I reckon 3 years should do it! Barry Robinson's Olympus and Glen Alison's Thunderbird taking top spots in appearance points, not much to separate the two - just lovely examples of skill and devotion to their craft.

Even I know that the standard of building is particularly high, all bar one of the entrants in Classic with their own builds, their own personalities shining through in their faithful recreations of classic designs, something to aspire to - and something I'm definitely appreciating more as I advance in years. Maybe worrying too much about attracting youngsters is missing the point . . . maybe they're just not ready - the world is a different place now, my childhood differs vastly from that of my son and daughter's - there were no attractive electronic devices engaging our attention like there is now - maybe we just need to encourage those that are ready, persuade those who have a bit of lived life experience - dare I say it in their 'middle age' . . . ?! and keep a positive outlook, keep encouraging and invite them along. . . ? Watching the joy on the faces of those competing in all

the disciplines across all the classes certainly filled me with enthusiasm.

The Vintage competition this year was well attended with another varied and fascinating array of aircraft, matched only by the pilots and their varied and fascinating attire! Living legends making up the lion's share of the field - watching the genesis of our sport still played out in the air is just superb - and shouldn't be discounted - to my shame I am STILL yet to tackle this challenging schedule - unique in its presentation and execution. Move ever forward - but don't forget your roots. . . . another airframe . . . another choice of build . . . hopefully not another 3 years!

To the other end of the spectrum - our relative newcomer, the Clubman Class - has been steadily establishing itself as an attractive proposition for those wishing to embark on the route of competition control line aerobatic. It can be difficult to know where to pitch this, without putting too much pressure on those perhaps competing for the very first time. I know when I flew my first schedule in a competition, in front of the much missed John Benzing - my hand was visibly shaking throughout the whole flight as I held the handle (don't tell anyone. . . but this happens to this day to me on occasion - such is the thrill of competition at times!).



I was glad there wasn't too much of an audience - other than my dear old Dad - bless him. This year, Colin Bell firmly grasped the nettle and clearly drew a line in the sand for others to fly up to - or beyond?! I can't wait for next year - I implore you to get building - buying, mix fuel or charging batteries - whatever does it for you - but do join in, I'm 10 years in - competitively flying; it took me 40 years to get there.. see.. it's perhaps not ALL about youngsters any more.. (just sayin'!).

So to the last day, just the f2b competition fly-off to square away, the top ten going through to fly again (Mr John Ash just missing out again, pipped to the post by the thinnest of margins - 3.1 points - John man!). The weather conditions were calm, the nerves - maybe not so much! Judges at the ready, our scorers- Mrs Helen Jones and Mrs Ang Williams (thank you both so much!), poised under the protection of the tent. Some early rain had cleared thankfully and the day was shaping up nicely with a gentle westerly

breeze greeting us from up the vale, perfect. Engines were readied, batteries checked, lines checked, pull tests, and - is that up. . . . yep. . . . yes it is. . . let's go. . . "ready" goes the cry to the judges and they're off. . . . the familiar dance of launch, schedule, retrieve - repeat is under way.

It was all there for me to snatch defeat from the jaws of victory. thankfully for me, despite SFHS - (shaking flying hand syndrome), I prevailed - a particularly poignant victory, which I dedicated wholeheartedly to my recently departed Dad, who - I'm sure would've been so proud - I was back, back flying IC.

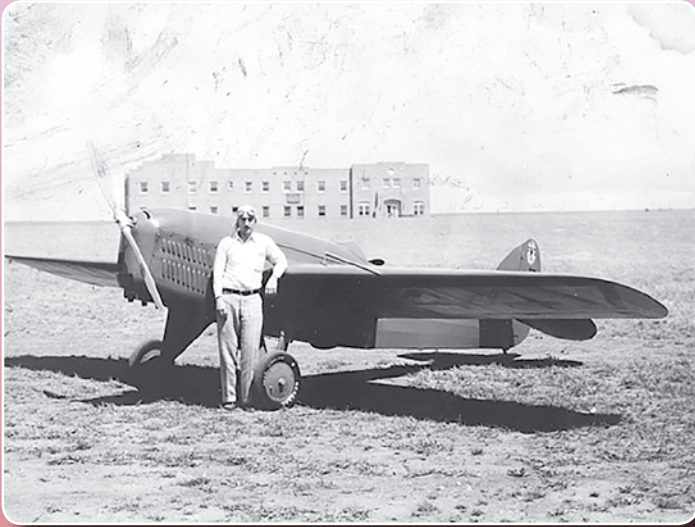
As the sun was continuing to shine - the lawn in front of the National Flying Centre Buildings was chosen for the medal ceremonies for all the control line disciplines, which was a nice touch; fitting that we all came together to celebrate control line competition flying in the end - Chris and Jill Barker conducting proceedings with efficiency and grace - the buildings providing a fitting backdrop - bravo.

The BMFA Control Line NATS - different - but really, the same in essence - nothing stays the same does it, it's all a journey, we've got to change with the world around us, some of it's easy - some of it, not so. . . we've got to adapt and find the good in whatever we do, and there's plenty of good in what we do - look at the smiles we encounter, the laughter and relationships we make through this great sport - keep going everybody, you're all really rather good at it, and I want to make sure my son has a NATS to go to when he's ready of course.

/Stephen White GBR



Cessna GC-1



In the early years of aviation a lot of activities to promote flying took place and this for many reasons. One is that aviation was a new invention that drew a lot of interest from the public, another is that the aviation industry developed in a pace never seen before and many investors saw a potential of future profits. One popular activity from the 10's up till the 30's was to arrange air races and many of them took place in America, some just once and some on a yearly basis (See Lina 2-2017, pp 52-53) but everyone with large prize sums.

For 1930 the company American Cirrus Engines sponsored a race to demonstrate the possibilities of long-distance flights by light airplanes. It was called "The All-America Flying Derby" and was the longest race ever held and had a first prize of 15.000 USD, a lot of money in those days. One requirement for the race was to have the aircraft powered by an American Cirrus or American Ensign engine.

18 aircraft started in the 1930 race and it took the winner 11 days to complete the course of almost 900 km. It was mandatory to make overnight control stops at Buffalo, New York, Cincinnati, Little Rock, Houston, San Angelo, Douglas, Los Angeles, Ogden, Lincoln, and Chicago before 10 of the 18 reached the final stop in Detroit. The race was won by Lee Gehlbach with a Command-Aire and Lowell Bayles with a Gee Bee as runner-up.

The Cessna GC-1 was built by the Cessna Aircraft Company for Blackwell Aviation with the only purpose to take part in the 1930 All-America Flying Derby. The plane was completed in 1929 and equipped with a 95 hp Cirrus Engine. It was a mid-wing open cockpit taildragger and the landing gear was attached by struts to both the fuselage and the wing spar. Blackwell registered it as NR-144V and from the beginning the plane was painted in Cessna red with black registration numbers but later changed to Cessna red with yellow registration number and the name "Miss Blackwell" on the cowling (just as on Karl-Georg's model). It placed 7th in the Derby and later that year it was 4th in the National Air Races. Unfortunately it was destroyed just some year later when it collided with a mail plane at Kansas City Airport.



A winter project?

Karl-Georg Krafft of Germany fell for the look of the Cessna GC-1 and decided to scale it down to be used in the C/L Semi Scale class. After some planning and different approaches of how to design the model he draw a plan and decided to make it in scale 1:5,1 thereby giving the model a wing span of 1580 mm and a fuselage length of 1110 mm. Both the fuselage and the wing have a traditional construction in balsa with reinforcements where it is necessary. The cowl is made from plywood and litho plate and painted while the model is covered with Hobby King plastic film. As you can see from the photos Karl-Georg have done his best to save weight by making light holes in rudders and ribs making the weight of the ready-to-fly model as low as 3,2 kg which must be considered light for a model of this size. To make it easier to transport the wings are detachable via carbon fibre tubes and secured with M3 bolts through an aluminum tongue. The engine chosen is a four stroke Saito 72 with a 14x6 propeller. Lines used are 19 metres.

As said earlier the model is used for C/L Scale and not intended for F2B maneuvers but being at contests the subject of scale it down further and fly aerobatic with it have been discussed with F2B pilots and it is a common opinion that it will be possible to adapt it for Aerobatics.

Photos in this article come from Karl-Georg, Axel Jungherz and RC-Network. More information about the Cessna GC-1 and the Air Races can be found on Internet. Contact Lina's editor to get a pdf drawing.

/Ingemar Larsson
(with help from Karl-Georg!)



Vänersborgspokalen 2023

Flertalet av de gånger vi kört Vänersborgspokalen har vädret varit hyfsat eller till och med underbart trots sen september eller tidig oktober. Så nån gång ska man väl drabbas av regn och blåst och i år var ett sådant tillfälle. Fredagens träning bjöd på en blandning av regnskurar och bra flygväder medan lördagen inleddes med regn och detta gjorde att tävlingen inte kom igång förrän vid 11-tiden. Men trots de 8 piloterna i 1.5-combat lyckades vi genomföra tävlingen hyfsat fort vilket gjorde att den sena eftermiddagen kunde ägnas åt att få ordning på Slow-modellerna inför söndagen.

Första omgångens första heat var av sådant slag att vän av ordning kunde börja miss-tänka lottningsfusk men det var inte fallet utan ibland kan Fru Fortuna hjälpa till att förgylla verkligheten. Nu blev det så att F2C-laget Clement/Gustafsson fick mötas för att klara ut alla årets meningsskiljaktigheter under deras världscup-resor. Nu blev det inga klipp utan Clement vann på tid. Fru Fortuna fortsatte i heat 2 där Thomas och Stefan fick mötas. Men Thomas hade ingen ordning på sina saker vilken gjorde att Stefan vann med full tid. Thomas var bara uppe 6 sekunder och ska man ta klipp under den tiden får man vara snabb. När Johan och Lennart möttes (återigen Fru Fortuna) hade båda full tid men Lennart vann med 3-0 i klipp (SM-revansch?). Till slut blev det en final mellan Lennart och Per där det åter blev klippen som avgjorde till Lennarts fördel (2-1). Därmed blev Lennart både vinnare av Vbg-pokalen och Riksmästerskapet. Per och Clement blev tvåa respektive trea i pokalen medan Stefan och Johan tog dessa platser i RM.



F2C-combat på hög nivå mellan Guffy och Clement.

"60+"-combat på hög nivå mellan Lennart och Per. Och längst kan Per sträcka ut sig!

Nordmännens kamp mellan Clement och Per.



Hög nivå var det också då Stefan och Clement möttes.



När det regnar och blåser småkallt ute är det inte fel att kunna samlas i ett varmt klubbhus för fika och tankeutbyte.



Thomas och Stefan i taktik-snack.

RM i Slow Combat och Combat 1.5



Per Vassbotn är en trogen deltagare i tävlingen. Här på väg in i cirkeln för att försöka spöa "Söta bror".



Veni-Vidi-Vici kunde Clement utbrista i efter insatsen i Slow Combat.



Stefan och Johan.

Söndagen bjöd på uppehåll men blåst vilket gjorde att vi kom fram till att skippa Weatherman-flygningarna. Dumt att riskera modellerna på gräset!

De 7 heaten i de två första omgångarna bjöd bara på 5 klipp totalt, ett mycket svagt resultat men det får helt och hållet skyllas på blåsten. Och lika dåligt blev det i de följande omgångarna förutom då Johan vann över Clement med 2-0 (Clements första förlust) och senare när Johan vann över Stefan med 4-1. Finalen mellan Johan och Clement blev klipplös och Clement vann på tid. Så dagen slutade med Clements första combat-vinst medan Johan blev Riksmästare. Så de två som möttes i SM-finalen i F2D i år fick alltså var sin RM-titel medan gamla stjärnskottet från Uddevalla (Stefan) kunde glida hemåt med två RM-silver i bagaget. Då vi nu också slutförde årets DM-tävlingar för Västergötland fick Stefan dessutom fylla ut prisskåpet med DM-segrar i Semistunt och Combat 1.5. Här vann Johan i Slow Combat och Ingemar i Weatherman.

Välkomna till Vänersborg nästa år. Är helt övertygad om att de som kom i år vill komma tillbaka och möta fler.

/Ingemar Larsson

Vbg-pokalen/Riksmästerskap Slow Combat

Plac.	Namn, Klubb	1	2	3	4	5	6
1/-	Clement Bindel	V3	V5	V9	F11	V13	
	CMBL, Frankrike	(370)	(480)	(464)	(380)	(348)	
2/1	Johan Larsson	V4	V7	F8	V11	V12	F13
	Vänersborgs MFK	(480)	(310)	(Disk)	(680)	(730)	(320)
3/2	Stefan Olsson	F3	V6	V8	V10	F12	
	Uddevalla RFK	(312)	(450)	(-)	(-)	(580)	
4/3	Lennart Nord	V2	F7	F10			
	Västerås FK Modell	(418)	(210)	(Disk)			
4/-	Per Vassbotn	V1	F4	F9			
	Agder MFK, Norge	(454)	(80)	(350)			
6/4	Ingemar Larsson	F2	F5				
	Vänersborgs MFK	(320)	(306)				
6/4	Thomas Olsson	F1	F6				
	Trollhättans MFK	(288)	(14)				

Vbg-pokalen/Riksmästerskap Combat 1.5:

Plac.	Namn, Klubb	1	2	3	4	5
1.	Lennart Nord	V4	V7	V11	V13	V14
	Västerås FK Modell	(692)	(580)	(280)	(500)	(680)
2/-	Per Vassbotn	V3	F7	V10	V12	F14
	Agder MFK, Norge	(328)	(360)	(404)	(496)	(536)
3/-	Clement Bindel	V1	V6	F9	F12	V
	CMBL, Frankrike	(464)	(532)	(172)	(444)	(432)
4/2	Stefan Olsson	V2	F5	V9	F13	F
	Uddevalla RFK	(480)	(394)	(480)	(316)	(370)
5/3	Johan Larsson	F4	V8	F10		
	Vänersborgs MFK	(480)	(wo)	(192)		
5/4	Ingemar Larsson	F3	V5	F11		
	Vänersborgs MFK	(164)	(474)	(268)		
7/5	Jan Gustafsson	F1	F8			
	Västerås FK Modell	(132)	(-)			
7/5	Thomas Olsson	F2	F6			
	Trollhättans MFK	(12)	(430)			



*Riksmästerskap
Combat 1.5*



*Riksmästerskap
Slow Combat*



*Vänersborgspokalen
Combat 1.5*



*Vänersborgspokalen
Slow Combat*

Nostalgia -

FAI F2C World Champs podiums



Maybe it all started at the FAI meeting in London in 1946 when the Scandinavian countries proposed that the focus be shifted from record setting to a total review of the rules to facilitate international competition exchange. Unfortunately, it was rejected as these views were not shared by the majority and the same was repeated at the meetings in Stockholm and Geneva. But at the meeting in Paris in 1948, among others, Belgium had swung and the proposals were heard. Now Control Line also received official recognition and was included in the FAI rules.

As early as 1949, the first international Criterium was held in Belgian city of Knokke (see Lina 2-2020) to be followed by competitions at the same place in both 1950 and 1951. In 1951, the speed competition was also announced as a World Champ. During the 50's, several Criteriums, European Championships and World Championships were announced, but as far as Team Racing is concerned, it is doubtful if any of the competitions had official World Championship status. In the available sources, different information abounds and it is difficult to draw any definite conclusions. In any case, it is clear that at a meeting in the late 1950's, FAI decided that all three classes would be run at a joint event and that all classes would receive official World Championship status. And that the first event with these rules would be run 1960 in Hungary.

The year before contest in Hungary F2C got some new rules. From previously running two qualifying heats, whereby the best three with the combined time from the two heats went to the final, it now became the case that you still had 2 qualifying heats, but that the 3 teams with the 3 best individual times went to the final. Likewise, the rules regarding whipping and high flying were tightened.



Herb Stockton and Don Jehlik.



Nery Bernard.



Pietro Fontana and Franco Amodio with their Picus Horridus model.



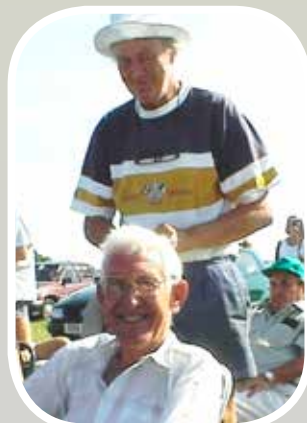
Don Haworth and Dick Place



The 1962 USSR Team of Boris Shkursky, Boris Krasnorutsky, Yuri Sirotkin, coach Vasilchenko, Alexander Babichev, Ivan Radchenko and Victor Zhelman.



Kjell Rosenlund and Miss FAI.



Charlie Taylor and Gordon Yeldham some 40 years later.



1964: Drazek, Trinka, Place, Haworth, Amodio and Fontana.

1960 Budapest Hungary

- | | |
|----------------------------------|-----|
| 1. Nery Bernard/Georges Lietzman | BEL |
| 2. Nils Björk/Kjell Rosenlund | SWE |
| 3. Gordon Yeldham/Charlie Taylor | GBR |

1962 Kiev USSR

- | | |
|----------------------------------|------|
| 1. Yuri Sirotkin/Boris Shkursky | USSR |
| 2. Viktor Zhelman/Ivan Radchenko | USSR |
| 3. Lajos Purgai/Sándor Katona | HUN |

1964 Budapest Hungary

- | | |
|---------------------------------|------|
| 1. Dick Place/Don Haworth | GBR |
| 2. Jiri Trnka/Milan Drazek | CSSR |
| 3. Pietro Fontana/Franco Amodio | ITA |

1966 Swinderby United Kingdom

- | | |
|---------------------------------------|------|
| 1. Herb Stockton/Don Jehlik | USA |
| 2. Günther Hohenberg/Helmut Turk | AUT |
| 3. Valentin Shapovalov/Ivan Radchenko | USSR |

1968 Helsinki Finland

- | | |
|-------------------------------------|------|
| 1. Herb Stockton/Don Jehlik | USA |
| 2. Karl Plotsin/Valery Timofeev | USSR |
| 3. Hans Gürtler/Herbert Baumgartner | AUT |

1970 - 1978



Valery Timofeev.



Karl Plotsin, Valery Timofeev, Valentin Shapovalov, Victor Onufrienko, Boris Krasnorutsky and Alexander Babichev.



Derek Heaton, Malcolm Ross, John Mau, Hans Geschwendtner, Rob Metkemeijer and Bert Metkemeijer.



Rob Metkemeijer.



Karl Plotsin.



Derek Heaton and Malcolm Ross.



Jens Geschwendtner and Luis Petersen.



Paul Bugl and Hans Straniak.



Luis Petersen and Valentin Shapovalov.



Victor Onufrienko and Alexander Babichev.

1970 Namur Belgium

1. Alexander Babichev/Boris Krasnorutsky USSR
2. Karl Plotsin/Valery Timofeev USSR
3. Valentin Shapovalov/Victor Onufrienko USSR

1972 Helsinki Finland

1. Karl Plotsin/Valery Timofeev USSR
2. Valeriy Kramarenko/Boris Krasnorutsky USSR
3. Valentin Shapovalov/Victor Onufrienko USSR

1974 Hradec Kralove Czechoslovakia

1. Valentin Shapovalov/Victor Onufrienko USSR
2. Paul Bugl/Hans Straniak AUT
3. Pietro Fontana/Franco Amodio ITA

1976 Utrecht The Netherlands

1. Victor Barkov/Volodymyr Surayev USSR
2. Luis Petersen/Jens Geschwendtner DEN
3. Valentin Shapovalov/Victor Onufrienko USSR

1978 Liverpool United Kingdom

1. Bert Metkemeijer/Rob Metkemeijer NED
2. Hans Geschwendtner/John Mau DEN
3. Derek Heaton/Malcom Ross GBR

But already at this first World Champ, things happened apart from the fact that the rules still needed to be developed, the jury/judges were inconsistent and subjective and the competition forms needed to settle. The wealth of invention is great and to get around being disqualified/warned for whipping several flew with their left hand. Partly you could then shorten the lines and partly it was easier to hide whipping.

Before the last round, there were two English teams (Taylor/Yeldham and Davy/Long respectively) and a Swedish team (Rosenlund/Bjork) who had the 3 best times with such a margin that it would be difficult for others to pass. But then the Belgian Bernard (with mechanic Lietzman) came in and flew with his left hand and with whipping and shortening of lines put Davy/Long out of the final. The Judges did not react but after the protests afterwards the Judges came up with the decision to ban left hand flying in the final. Once in the final, Bernard succeeded in a maneuver to get the English team into a hard landing that bent their models landing gear. English protest afterwards was rejected. Rosenlund had higher speed and held off and crossed the finish line first. But due to foul play, after the final Rosenlund was disqualified as he had one foot inside the circle during a refueling. Something that had been allowed earlier during the competition. And that made Bernard win and go home with a trophy and a tarnished reputation. Like Ugo Rossi in F2A (see Lina 2-2021). As a parenthesis, it can be mentioned that both were absent from the Championship the following year. If you want to read more about this, Adrian Duncan has written an article worth reading that was both published in Aeromodeller and is available on Adrian's website.

Another notable thing was that one of the American teams (father and son Edwards) used a Cox Olympic glow plug engine. They made it do the laps also start well but in terms of speed it couldn't compete with the diesels.

1980 - 1988



J Albritton, W Perkins, J Mau, H Geschwendtner, C Brown and S Smith.



Volodymyr Surayev.



J van Uden, R van Uden, C Brown, S Smith, F Kuhnegger and H Nitsche.



**Steve Smith and Colin Brown
20 years later....**



Frederico Rossi, Andrea Rossi, Valentin Shapovalov, Victor Onufrienko, Victor Barkov and Volodymyr Surayev.



Vladimir Ivanov, Yuri Shabashov, Volodymyr Surayev, Victor Barkov, Yuri Nazin and Oleg Vorobiev.

The 1962 Championship received only positive criticism for one thing; the excellent scoreboard. Otherwise, it was bad administration, bad Judge decisions and too short warm-up time in F2C compared to the rules. In the final, the two Russian teams worked together and made life miserable for the Hungarian team. Protests that the winner's model did not follow the rules were rejected.

In 1964, the warm-up time was increased from 0.5 minutes to 1 minute after a decision at the Team Managers meeting. At the World Champs in England in 1966, the final was given the epithet "Excellent and well-flown". The same thing happened in 1968 with a tight and well-flying final. This year was also the first time with a 7 cc tank instead of a 10 cc plus 200 laps in the final. During the 60's Schnuerle porting also came into use in the engines where one of the leading figures was Paul Bugl.

This with well-flown finals was really topped in 1970 when the reviews call it the "Cleanest final ever". In 1972, Finland stepped in late to organize the Championship after the ordinary organizer dropped out. Unfortunately, this World Championship faced the fact that many countries did not participate. Sometime during this period also came the rule that the mechanic could not catch the model in the air as it had to be on the ground with the engine off first.

At the World Champs in Czechoslovakia in 1974, several teams used groupers (ie to get the lines together) to reduce air resistance. And those who didn't come there with groupers were not slow to use them on the spot as it reduced the heat times by 10-15 seconds.

1980 Czestochowa Poland

- | | |
|--------------------------------|-----|
| 1. Hans Geschwendtner/John Mau | DEN |
| 2. John Albritton/Walt Perkins | USA |
| 2. Steve Smith/Colin Brown | GBR |

1982 Oxelösund Sweden

- | | |
|--|------|
| 1. Valentin Shapovalov/Victor Onufrienko | USSR |
| 2. Frederico Rossi/Andrea Rossi | ITA |
| 3. Victor Barkov/Volodymyr Surayev | USSR |

1984 Chicopee USA

- | | |
|--------------------------------------|-----|
| 1. Steve Smith/Colin Brown | GBR |
| 2. Reneé van Uden/Johan van Uden | NED |
| 3. Heinz Nitsche/Friedrich Kuhnegger | AUT |

1986 Pecs Hungary

- | | |
|--|------|
| 1. Victor Barkov/Volodymyr Surayev | USSR |
| 2. Sergei Burtsev/Victor Onufrienko | USSR |
| 3. Vladimir Zhironov/Vladimir Shevchenko | USSR |

1988 Kiev USSR

- | | |
|------------------------------------|------|
| 1. Victor Barkov/Volodymyr Surayev | USSR |
| 2. Yuri Shabashov/Vladimir Ivanov | USSR |
| 3. Yuri Nazin/Oleg Vorobiev | USSR |

1990 - 1998

In 1976, there was again a big uproar with the Judges and it resulted in them being replaced a bit into the competition. For this Championship, the rules had been changed and groupers were now prohibited. The semi-final was run with 2 heats of which the 3 best times went to the final.

In terms of technological innovations, two things stood out. One was that some teams started using retractable landing gears and the other was the Swedish Team Larsson/Rylin who were the only ones to run 50-lap rounds with their Rossi. Which meant they went to the final and finished 0.5 lap behind the winning Russian team. But later they were disqualified when their engine was found to be slightly too big and again there was a discussion about rule interpretation and how to measure which resulted in rule clarifications for the next Championship.

At the contest in 1980, AAC engines began to be used to completely take over from the engines used within a few years. The discussions this time mostly concerned the final (again!) where the English and American teams got entangled with each other at the first pit stop, whereby the Danes alone could fly to the end. The two teams that could not complete waited for the Judge's decision for a re-flight, but none came. When protests were submitted, they were rejected on the grounds that they came in too late plus there was no time to re-fly as the organizer wanted to hold their closing ceremony. Here, too, this led to clarifications in the rules for upcoming Championships.

Around 1980, you also started to see more and more flying wings and the discussions came as to whether these fulfilled the requirements of the rules for a Semi-scale appearance. Now more and more teams began to see the advantage of using shut-offs and this eventually led to these becoming mandatory. The propellers went from wood and plastic via fiberglass to carbon fiber and during a period in the 80s/90s, single-bladed carbon fiber propellers were also used, but their saga in F2C was quite short.



*Heiner Borer
and Cesare
Saccavino.*



*Hans Straniak and
Josef Fischer.*



*Elvis Pirazzini, Vladimir Ivanov, Yuri Shabashov, Gino Voghera,
Marcello Magli and Andrea Rossi.*

1990 Blenod France

- | | |
|-----------------------------------|------|
| 1. Yuri Shabashov/Vladimir Ivanov | USSR |
| 2. Marcello Magli/Elvis Pirazzini | ITA |
| 3. Gino Voghera/Andrea Rossi | ITA |

1992 Hradec Kralove Czechoslovakia

- | | |
|-----------------------------------|-----|
| 1. Vladimir Titov/Victor Yugov | RUS |
| 2. Yuri Shabashov/Vladimir Ivanov | RUS |
| 3. Roberto Pennisi/Andrea Rossi | ITA |

1994 Shanghai China

- | | |
|-----------------------------------|-----|
| 1. Heiner Borer/ Cesare Saccavino | SUI |
| 2. Vladimir Titov/Victor Yugov | RUS |
| 3. Josef Fischer/Hans Straniak | AUT |

1996 Norrköping Sweden

- | | |
|-----------------------------------|-----|
| 1. Roberto Pennisi/Andrea Rossi | ITA |
| 2. Yuri Nazin/Oleg Vorobiev | RUS |
| 2. Marcello Magli/Elvis Pirazzini | ITA |

1998 Kiev Ukraine

- | | |
|-----------------------------------|-----|
| 1. Sergei Andreev/Sergei Sobko | RUS |
| 2. Marcello Magli/Elvis Pirazzini | ITA |
| 3. Vladimir Titov/Victor Yugov | RUS |



*Roberto Pennisi, Andrea Rossi, Oleg Vorobiev, Yuri
Nazin, Marcello Magli and Elvis Pirazzini.*

New for 1996 was that each team now got three qualifying heats, of which the best got to fly two Semifinal heats. How many that were allowed to fly in the Semi's was determined by the number of participating teams.

During the 21st century, many rule changes have been aimed at safety and reducing noise levels and speed. The changes that have come have been a maximum of 3 mm venturi intake, a mandatory wrist strap, lines with a minimum diameter of 0.35 mm, rules for how the engine's exhaust should be on the model, minimum number of pit stops in heat/final and now most recently a ban on using a retractable landing gear (not yet implemented).

Over the years, the engine in an F2C model has also changed. From the beginning there was a large range of different brands although ETA, Oliver Tiger, ED and Super Tigre dominated. Then these were followed by Bugl and Rossi plus somewhat later Nelson and Cipolla. Of course there have also been many home built engines especially from Eastern Europe and today engines from Eastern Europe are more or less standard among all competitors.

This concludes Lina's series on World Champs Podiums and I hope you enjoyed reading all four articles. And perhaps sentimental memories have also flowed over you and brought a tear to the corner of your eye?

/Ingemar Larsson

2000 - 2008



Start in the 2008 final; Hugh, Thierry and Pascal.



Vladimir Ivanov, Yuri Shabashov, Pascal Surugue, Georges Surugue, Yuriy Chayka and Valeriy Kramarenko.



Jean Maret and Jean Paul Perret.



Yurii Bondarenko, Semen Lerner, Georges Surugue, Pascal Surugue, Valeriy Kramarenko and Yuriy Chayka.



Thierry Ougen, Roland Surugue, Hugh Simons, Grant Potter, Pascal Surugue and Georges Surugue.



Semen Lerner and Yurii Bondarenko.



Hugh Simons and Thierry Ougen in the 2008 final.

2000 Landres France

- | | |
|-----------------------------------|-----|
| 1. Jean Maret/Jean Paul Perret | FRA |
| 2. Yurii Bondarenko/Semen Lerner | UKR |
| 3. Yuri Shabashov/Sergei Moskalev | RUS |

2002 Sebnitz Germany

- | | |
|-----------------------------------|-----|
| 1. Yurii Bondarenko/Semen Lerner | UKR |
| 2. Yuri Shabashov/Sergei Moskalev | RUS |
| 3. Thierry Ougen/Roland Surugue | FRA |

2004 Muncie USA

- | | |
|------------------------------------|-----|
| 1. Pascal Surugue/Georges Surugue | FRA |
| 2. Valeriy Kramarenko/Yuriy Chayka | UKR |
| 3. Yuri Shabashov/Vladimir Ivanov | RUS |

2006 Valladolid Spain

- | | |
|------------------------------------|-----|
| 1. Pascal Surugue/Georges Surugue | FRA |
| 2. Yurii Bondarenko/Semen Lerner | UKR |
| 3. Valeriy Kramarenko/Yuriy Chayka | UKR |

2008 Landres France

- | | |
|-----------------------------------|-----|
| 1. Hugh Simons/Grant Potter | AUS |
| 2. Thierry Ougen/Roland Surugue | FRA |
| 3. Pascal Surugue/Georges Surugue | FRA |

2010 - 2022



Pascal Surugue, Georges Surugue, Ihor Osadchui, Volodymyr Makarenko, Kevin Su and Chris Wee.



Pascal, Volodymyr and Kevin.



Mark Poschkens, Murray Wilson, Rob Fitzgerald, Mark Ellins, Roland Surugue and Thierry Ougen.



Thierry and Rob.



Georges.



Thierry and Roland.



Vyacheslav Dukov, Sergei Dozhidaev, Sergei Andreev, Oleg Vorobiev, Denis Gorokhov and Pavel Gorokhov.



Mark Ellins, Rob Fitzgerald, Oleg Vorobiev, Sergei Andreev, Murray Wilson and Mark Poschkens.

2010 Gyula Hungary

- 1. Robert Fitzgerald/Mark Ellins AUS
- 2. Antonio Cardoso/José Goulao POR
- 3. Yurii Bondarenko/Semen Lerner UKR

2012 Pazardzhik Bulgaria

- 1. Sergei Andreev/Oleg Vorobyev RUS
- 2. Robert Fitzgerald/Mark Ellins AUS
- 3. Murray Wilson/Mark Poschkens AUS

2014 Wloclawek Poland

- 1. Sergei Andreev/Oleg Vorobiev RUS
- 2. Sergei Dozhidaev/Vyacheslav Dukov RUS
- 3. Yurii Bondarenko/Semen Lerner UKR

2016 Perth Australia

- 1. Robert Fitzgerald/Mark Ellins AUS
- 2. Murray Wilson/Mark Poschkens AUS
- 3. Thierry Ougen/Roland Surugue FRA

2018 Landres France

- 1. Sergei Andreev/Oleg Vorobiev RUS
- 2. Sergei Dozhidaev/Vyacheslav Dukov RUS
- 3. Denis Gorokhov/Pavel Gorokhov RUS

2022 Wloclawek Poland

- 1. Volodymyr Makarenko/Ihor Osadchui UKR
- 2. Pascal Surugue/Georges Surugue FRA
- 3. Kevin Su/Christopher Wee SIN



Semen Lerner, Yurii Bondarenko, Mark Ellins, Rob Fitzgerald, Antonio Cardoso and José Goulao.

My regards to Derek Heaton and Volodymyr Surayev for help with fact checking and photos. I would also acknowledge Colin B, Bjarne S, Massimo S, Heiner B, Hans S, Aldo Z, Elvis P, Adrian D, Harry B, Rob F, Lluís P, Luis P, Serge D, Mervyn J, Jens G, Luc D, Alan C, Hans V, Jesper B, John B, Niels L and Walt P for help with photos. If I have forgotten to mention any name I apologize.

Amusements

- A quiz for Modellers

This year we offer a quiz that hopefully will give you some nice moments in the sofa. All questions are in some way related to aviation and span over a long time period.

Send your answers to Lina's editor before end of February. You find the address on page 3. There will be Book prices!

PS. Use your brain and not Google! DS.

/Conny & Ingemar



What was the name of the Science-Fiction series, drawn by Björn Karlström, which was published for a short period in the late 40's...?

1. Space Tommy
- X. Space John
2. Space Biggles



Paul Bugl was a famous engine designer, the man behind HP and Bugl, among others.

But when was he born?

1. 1930
- X. 1928
- 2: 1926



The model engine Sassi .15 was manufactured in:

1. Spain
- X. Brazil
2. Portugal



One famous American speed flyer was Bill Wisniewski. In the beginning of the 50's he designed a speed model called:

1. The Screaming Demon
- X. The Jumping Tornado
2. The Bee Wee Blizzard



Who is the designer of this engine?

1. Andersen, Oslo
- X. Pinotti, Stockholm
2. Egersen, Copenhagen



What is this type of construction called?

1. I-beam
- X. T-bone
2. H-rib



Who designed the first C/L model that flew off under its own power after running on the ground:

1. Victor Tatin
- X. Clement Ader
2. Charles Richet



Which nation's model aviation association has (had) this logo:

1. Bolivia
- X. Argentina
2. Brazil



When the first recognized cargo flight was conducted in the infancy of aviation, the cargo contained:

1. Light bulbs
- X. Mail
2. Oysters



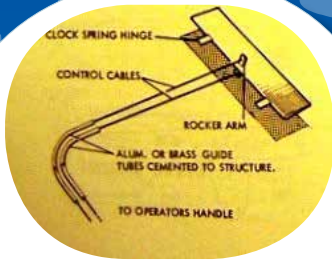
What is the difference between the stabilizer and control surfaces?

1. C
- X. A
2. D



How much of the F2B pilot model is made of wood?

1. 100%
- X. 50%
2. 25%



10

What is this type of control system called?
 1. G-control
 X. U-control
 2. F-control



21

Who made the first controlled powered flight in Europe:
 1. Otto Lilienthal
 X. Jacob Ellehammer
 2. Louis Bleriot



22

What was the cost of an ED 2.46 cc Racer in June 1967:
 1. £ 3/18/5
 X. £ 4/5/12
 2. £ 5/2/8



20

Why is the Nobler kit in the Green Box so attractive:
 1. It was the first kit of a Nobler and therefore more desirable
 X. This Nobler has better flight characteristics than other kits
 2. The material is extra carefully selected in this kit



Vernon Hunt is a famous English model pilot and combat judge. But what year did he start with control line?
 1. 1961
 X. 1963
 2. 1965



The Webra Boxer 7.6 cc was delivered with a built-in vacuum pump, intended to drive pneumatic servos. Who made this control system...?
 1. Stegmeier
 X. Engel Modellbau
 2. Movo



Angular difference datum lines of the camber of the airfoil called?
 X. Camber
 1. Decalage
 2. Decalage



In the 1950's there was a model flying club in Västerås (Sweden) with the name:
 1. MFK Tornado
 X. MFK Cucumbers
 2. MFK Speedy



What is the name of this model?
 1. Piper Skyline
 X. Piper Skylark
 2. Piper Skycycle

15

19



Does Kungsbacka's Michael Palm weigh?
 1. 1,12 ton
 X. 132 kg
 2. 12254 gr



Which model has been the inspiration for the stunt plane Nakke?
 1. Nobler
 X. Shark
 2. Thunderbird

14



This instrument makes us think of the First World War and a...
 1. Flight Maneuver
 X. Aircraft Engine
 2. Pilot

16

17



A Pylon Engine that makes us think of... Well, what?
 1. An English Sailor
 X. A German Field Marshal
 2. A French Bouillabaisse

18

13



VÄSTKUSTTRÄFFEN

Den 16 september möttes de igen, kämparna från Väst, Öst, Syd och Nord, för den årliga kampen i den anrika Stunttävlingen "Västkusträffen". I år saknade vi dock kämparna från Norge och Danmark och hoppas att vi får se dem nästa år. Finland däremot, hedrade oss med två stycken deltagare. Vi hade en makalös tur med vädret då det veckorna före och efter tävlingshelgen (med sol och svag vind) var riktigt skitväder.

Den nya cirkeln vi klippt upp var till belåtenhet för alla, jämn och fin och vi slipper humporna (lokal dialekt som betyder "bulor" i övriga Sverige) som blir vid RC-banorna. Jag är faktiskt lite stolt över att jag fick igenom detta i klubben!

Vi tävlade i F2B, Semistunt och Weatherman Vintage Speed. I Stunt hade vi Kauko Kainulainen och Johan Larsson som domare och vi tackar dessa för deras tålmod att sitta och titta på oss hela dagen. Sekreteriat och poängräkning sköttes av Ingvar Nilsson.

Tävlingen flöt på utan intermezzon, alla var disciplinerade som vanligt och ingen onödig väntetid uppstod. Efter två omgångar tog vi lunchpaus och som brukligt dukades smörgåsar, kaffe och dricka upp i klubbhuset. Hur gick det då i tävlingen? Skulle Staffan flyga på sin "... Edge" och slå vår nyblivne svenske mästare Niklas? Skulle de nya stjärnskotten Ingvar A och Thomas O sticka upp och blanda sig i gammel-gubbarnas kamp?

Redan i första flygningen visade Staffan var skåpet skulle stå och han var den ende som hade över 1000 poäng. Som vanligt (ja, nästan) flög han sin Impact-variant med OS VF 46 och pipa till seger!

Anders Hellsén har fått sin Niklas-byggda Trivial Pursuit med pipad Enya 61 att gå som han vill och blev därmed tvåa.

Den stabila motorgurun Lennart Nord blev trea. Han flög Yatsenko Classic med Retro Discovery 68.

Niklas lyckades inte komma upp i sin SM-nivå och blev till slut fyra. Han har i mitt tycke Sveriges snyggaste stuntmodell, en Thunder Gazer med en PA 75 och pipa. Femma blev undertecknad med ett egenkonstruerat flygplan kallat S-1 eller Esset. Motor är en OS LA 46. På 6:e plats kom Kai Karma, även han med ett egenkonstruerat flygplan. Hans motor är intressant då det är en Super Tigre 51 med egentillverkad kolv/foder vilket gör att den hamnar på strax under 10 cc.

Sjunde mannen var trevligt att se igen då vi saknat Lars Roos på flera tävlingar. Lars hade ett intressant flygplan, en LA-4 från Alexander Leonidov, Ukraina. Motorn är en Leonidov 76 som murrade gott.

På åttonde plats hittar vi nykomlingen i F2B, Thomas Olsson. Han hade tyvärr gått i backen med sin Retro Discovery 61-utrustade Psyclone. Thomas fick istället flyga sin Vector med en Stalker 40 och det var ingen nackdel då det såg stabilt ut. Snart får vi nog se honom högre upp i resultatlistorna. Alf Lindholm lyckades inte riktigt denna gång då han blev nia. Alf flög en variant av Blue Max med en pipad OS VF 46.

Nykomlingen som inte är så mycket nykomling egentligen heter Ingvar Abrahamsson och kom tia. På 80-talet flög han combat på hög nivå med bland annat ett VM-silver som största merit. Nu hade han letat fram en 30 år gammal Super Chipmunk med en Fox 35 som han svingade runt i cirkeln. Semistuntarna Torbjörn Lundgren och Ingemar Larsson hade inget att sätta emot

Stefan Olsson vilken flög en Strega (med en Avastar 61) ursprungligen byggd av Ingvar Nilsson. När Torbjörn lär sig flyga inverterat samt göra buntar kommer han att kunna ge de andra en match. Ingemar flög en gammal Pilot-byggsats vid namn Prince vilken Alf Eskilsson byggt en gång i tiden. Motorn är en Super Tigre 40. Ingemar måste vänja sig av med combatstilen och flyga mjukare. Då kan han vinna!

Med 8 piloter till start i Weatherman blev det en kamp om platserna, kanske förutom den översta då där Lennart återigen pressade sitt rekord. Men plats 7 till 2 låg mellan 83 % och 98 % och jag kommer inte ihåg när nästan hela startfältet legat så tätt ihop. Även om vi var i Weatherman-flygandets Mekka kom "bara" 2 Kungsbackaiter till start där båda flög Mills och då Ingvar satt och räknade stuntprotokoll hela dagen utnyttjande han möjligheten till proxy i form av Ingemar som pilot och Lennart som mekaniker vilket gjorde att han passerade Mills-Hannes i resultatlistan!

Ingemar-Drabanten var nu bara 0,4 sekunder från rekordet och med lite mer propellerstestande ska det nog slås. Stefan har liknande situation då han var 0,4 sekunder från att komma under 20 sekunder med sin Parra 09 glöd. Det är 1 sekund upp till Pers rekord satt med samma sorts motor som Stefan har..... så koden för att åka fortare måste knäckas. Samma funderingar har Thomas med sin Profi 1 cc glöd där rekordet också ligger 1 sekund upp (ner?) men de propeller-tester Thomas håller på med verkar lovande. Den THK 09 glöd som Johan flyger med har ju potential att flyga lika fort som Parra-motorn men tiden saknas för allt testande som behövs.



Snacka om synkroniserade tidtagare! Hur ofta händer det att de lyckas få på hundra delen samma tid?



Torbjörn Lundgrens W-modell (byggd av Thomas Olsson).



Protokollöpare Ola Lindgren samt stuntdomarna Kauko Kainulainen och Johan Larsson. Vad skulle vi göra utan dem?



Ingvar Abrahamsson har hittat tillbaka till linflygciirkeln! Han deltog med en 30 år gammal SIG Super Chipmunk och Fox 35.



Lars Roos premiärtävlande med sin fina RTF-modell LA-4.



Alf Lindholm kom hela vägen från Finland. Han är en trogen deltagare på våra tävlingar i Sverige.

RESULTAT 56:E UPPLAGAN AV VÄSTKUSTTRÄFFEN Inlag, Kungsbacka, 16 september 2023

Sekretariat: Ingvar Nilsson, protokollöpare Ola Lindgren
Stuntdomare: Johan Larsson och Kauko Kainulainen

F2B Stunt

Plac.	Namn	Klubb	Omg 1	Omg 2	Omg 3	2 bästa
1.	Staffan Ekström	Trelleborgs MFK	1007	986	999	2006 p
2.	Anders Hellsén	MFK Snobben	969	940	968	1937 p
3.	Lennart Nord	Västerås FK Modell	935	957	973	1930 p
4.	Niklas Löfroth	Karlskoga MFK	966	948	960	1926 p
5.	Michael Palm	Kungsbacka MFK	868	896	925	1821 p
6.	Kai Karma	SIL, FIN	753	822	884	1706 p
7.	Lars Roos	Trelleborgs MFK	603	850	846	1696 p
8.	Thomas Olsson	Trollhättans MFK	750	849	801	1650 p
9.	Alf Lindholm	Ekenäs MFK FIN	777	846	685	1623 p
10.	Ingvar Abrahamsson	MFK Snobben	563	606	741	1347 p

Semistunt

Plac.	Namn	Klubb	Omg 1	Omg 2	Omg 3	2 bästa
1.	Stefan Olsson	Uddevalla RFK	487	496	509	1005 p
2.	Ingemar Larsson	Vänersborgs MFK	431	300	433	864 p
3.	Torbjörn Lundgren	MFK Snobben	70	156	100	256 p

Weatherman Vintage Speed

Plac.	Namn	Klubb	Klass-Tid-Hastighet-%	Motor
1.	Lennart Nord	Västerås FK Modell	2.5D 16,6 s / 174,4 km/h / 100,6 %	Zorro
2.	Ingemar Larsson	Vänersborgs MFK	2.5DA 25,4 s / 114,0 km/h / 98,4 %	Drabant
3.	Stefan Olsson	Uddevalla RFK	1.5G 20,4 s / 141,9 km/h / 95,1 %	Parra
4.	Thomas Olsson	Trollhättans MFK	1G 10,9 s / 132,8 km/h / 90,8 %	Profi
5.	Ingvar Nilsson	Kungsbacka MFK	Mills 19,1 s / 75,8 km/h / 90,1 %	Mills
6.	Hannes Illipe	Kungsbacka MFK	Mills 20,2 s / 71,7 km/h / 85,1 %	Mills
7.	Johan Larsson	Vänersborgs MFK	1.5G 23,2 s / 124,8 km/h / 83,6 %	THK
8.	Torbjörn Lundgren	FK Snobben	2.5D 23,9 s / 121,2 km/h / 69,9 %	Fora

Austrian F2B Nationals



Kamil Meisl and Pavel Benes.



Tibor Vellai.



Adi Hansemann and Hanno Miorini.



Tibor Vellai and Attila Morotz.

In addition to Radfeld in Tyrol, Weikersdorf am Steinfeld also becomes a mecca for controlline flying in Eastern Austria. The Steinfeld Cup in the F2B CL flight class was held here for the third time on October 14th, 2023. The Austrian C/L Chairman Hanno Miorini, Chairman Karl Nagl and Contest Director Heimo Stadlbauer welcomed nine pilots to the competition. Unfortunately only four Austrian pilots took part, but the presence of five foreign pilots from the Czech Republic and Hungary significantly enhanced the competition.

In terms of weather, there was essentially no wind during the first round, but the wind picked up in the second round and increased to such an extent before the start of the third round that it could no longer be flown. After two rated flights, the winner was determined. Like last year, Pavel Benes (CZE) won ahead of Kamil Meisl (CZE) and Attila Morotz (HUN). Tibor Vellai (HUN) achieved fourth place. The four Austrian pilots were able to take fifth and seventh to ninth place. Fifth place went to the Austrian Champion Franz Wenzel (MBC Günselsdorf), followed by Istvan Travnik (HUN), Adi Hansemann, Franz Marksteiner and Hanno Miorini.

Under the competition management of Heimo Stadlbauer, the competition went off without any problems, apart from two reflights and the early end. The Jury only had to take action for the competition ended early. Of the nine participants, two were with combustion-powered models, Hanno Miorini and Istvan Travnik. The remaining pilots used electric motors with 5 or 6s LiPo batteries. The Judges Pavol Barbaric (SVK), Franz Oberhuber (AUT) and Maximilian Marksteiner (AUT) judged the 15 figures of the difficult competition program fairly.

The award ceremony was carried out by chairman Karl Nagl, Jury member Roland Dunger and Contest Director Heimo Stadlbauer, with the first three prize winners receiving a laser-engraved trophy.

Many thanks to Karl Nagl's team, the kitchen staff and the pilots, some of whom did not shy away from a long journey. The food was again excellent, especially the famous pancakes! We look forward to see you again in 2024 at the 4th Steinfeld Cup/Austrian Championship at MFC Weikersdorf.

Heimo Stadlbauer
AUT



Istvan Travnik.

Steinfeld Cup 2023



Franz Wenzcel and Franz Marksteiner.



Adi Hansemann.



Pavel Benes beautiful Valkyrie.



Franz Marksteiner with an overhead figure. In the background the Judges Franz Oberhuber (AUT), Maximilian Marksteiner (AUT) and Pavol Barbaric (SVK).



Hanno Miorini starts his 10 cc Super Tigre assisted by Adi Hansemann.



Kamil Meisl (CZE), Pavel Benes (CZE) and Attila Morotz (HUN).

Scale effect on structural strength

There are many model aircraft projects and often, coincidentally, what we are missing are the dimensions in the size which we would like to make the model, especially when we scale it up or down from a given plan.

To overcome this, an existing project can be easily enlarged or reduced but, as we all know, physical variations occur in the scaled model that are not proportional to each other and something changes in the way it will behave compared to the original project.

I do not enter into the discussion of variations in aerodynamic behavior because I believe that these are relevant only in the field of high performance and not in a reproduction or in a fun model. Within certain limits, we can safely keep the original aerodynamic design and we will have no problem if we build, balance and trim as it should be.

The situation is different in the structural field where, I will never be tired of repeating it, one cannot improvise and it is necessary to pay particular attention not to frustrate, even if in good faith, the meticulous work of the designer and endanger our life and those who attend the airfield. Of course, this method will be valid using the same materials as the original design and within certain limits, let's say scale factors of maximum 2 or exceptionally 3. Going beyond these values variations would be too great and it would be better to redesign everything.

After this introduction, let's move on to analyze in a not too complicated way what happens at the level of stress and resistance of the materials if the dimensions of a structure and therefore also of our model change. When we enlarge (or shrink) our model according to a certain ratio, it happens that the physical dimensions vary differently:

- Lengths (and widths) vary in direct proportion to the scale factor.
- Areas vary in proportion to the square of the scale factor.
- Volumes/Weights vary in proportion to the cube of the scale factor.
- Resistance of materials does not vary

To explain what this entails I will give a small example:

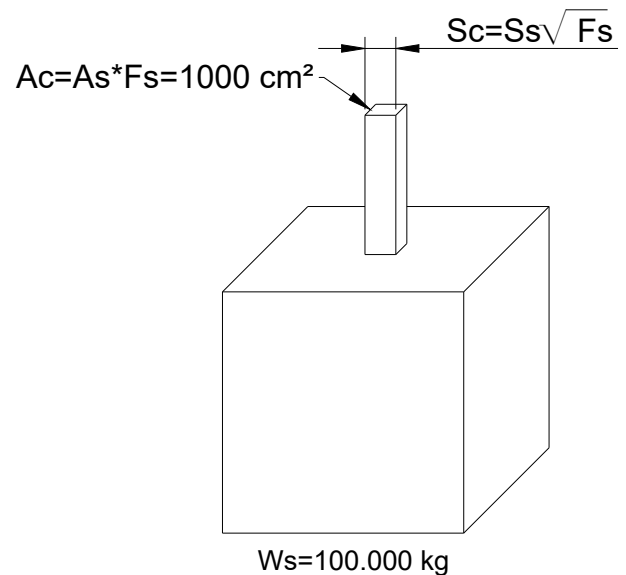
We have an object that weights $W=100$ kg, hanging on a square section bar with side $S=1$ cm with area $A=1$ cm² ($A=S^2$). The bar will be subjected to tension, based on the Weight related to the section Area, with a load ($L=W/A$) of 100 kg/cm².

I use a scale Factor of $F_s=10$ for simplicity of calculation even if in reality, as mentioned, it is not really the case to get to that value. We will have that the bar will have a scaled Side $S_s=10$ cm, i.e. the original side multiplied by the Scale factor ($S_s=S \cdot F_s$), the area of the scaled section $A_s=100$ cm², i.e. the Area of the original section multiplied

for the squared scale Factor ($A_s=A \cdot F_s^2$), and the scaled Weight of the suspended object $W_s=100,000$ kg, that is the original Weight multiplied by the cube scale Factor ($W_s=W \cdot F_s^3$). The scaled Load would be, based on the scaled Weight compared to the scaled section Area ($L_s=W_s/A_s$) of 1000 kg/cm².

We have said, however, that the strength of the material does not vary with the variation of the dimensions; this means that to avoid breakage we must keep the load to which the bar is subjected equal and to do this we must apply a correction factor (C_f) that leads us to keep unchanged the ratio between the stress and the area of the section on which it is applied.

To achieve this, it is necessary that the Area of the resistant section grows, like the Weight, due to the cube of the scale factor instead of the square. So, the corrected area (A_c) will be equal to the initial area multiplied by the cube of the scale Factor ($A_c=A \cdot F_s^3$) which is equivalent to the scaled Area multiplied by the scale Factor ($A_c=A \cdot F_s^3 = A \cdot F_s^2 \cdot F_s = A_s \cdot F_s$).



In our corrected example we will therefore have an object that always weights $W_s=100,000$ kg, hanging on a square section bar with the corrected Area $A_c = 1000$ cm² ($A_c = A \cdot F_s^3 = A \cdot F_s^2 \cdot F_s = A_s \cdot F_s$). The bar will be subject to tension, based on the weight compared to the corrected area of the section, with a load ($L_c = W_s/A_c = 100.000/1000$ [kg/cm²]) of 100 kg/cm², that is, we have restored the initial load.

The corrected dimension of the Side (S_c) of the bar that holds the scaled Weight (W_s) while maintaining the initial stress will be equal to the square root of the corrected Area (A_c):

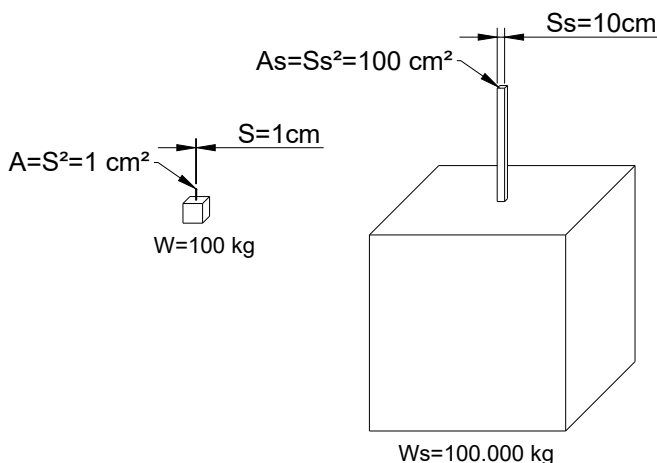
$$S_c = \sqrt{A_c}$$

By developing this formula:

$$S_c = \sqrt{A \cdot F_s^3} = \sqrt{A \cdot F_s^2 \cdot F_s} = \sqrt{A_s \cdot F_s} = \sqrt{S_s^2 \cdot F_s} = S_s \cdot \sqrt{F_s}$$

The final formula we will use will be:

$$S_c = S_s \cdot C_f$$



Where:

S_c is the corrected strip size that we will actually use on the structure of our model.

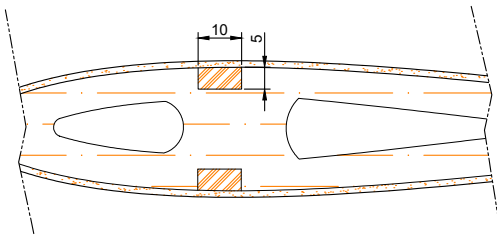
S_s is the size of the strip that we will detect from the drawing of our model printed already scaled to the desired size.

C_f is our correction factor = $\sqrt{F_s}$.

Let's take an example:

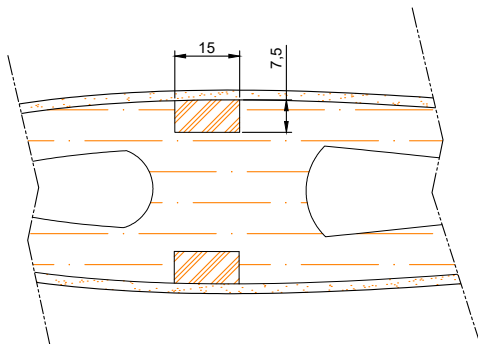
We have plans for a 1.2 m wingspan model built with 10x5 mm strips. We want to scale it in order to have a 1.8 m wingspan model. Our scale factor (F_s) will be the ratio between the desired wingspan and that of the original plans (1.8/1.2 = 1.5).

Strips dimensions on the original plan



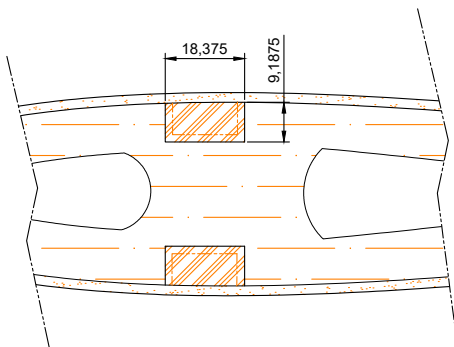
On our new plans printed with a scale ratio of 1.5 we measure that the strips have dimensions 15 x 7.5 mm.

Strips dimensions on the upscaled plan



Our correction factor will be: $C_f = \sqrt{1.5} = 1.225$

Strips dimensions corrected on the upscaled plan



We will have to use strips of a minimum size of (15*1.225 = 18.375) x (7.5*1.225 = 9.1875) mm for the construction or round off to the immediately higher size available on the market of the same material indicated on the project.

Piero Incani
ITA



TIPS från Coachen



Hur man får bort en avbruten gängtapp!

Tidigare i år skulle jag borra och gänga upp sex nya M2-hål för glödtoppsringen i ett vevhus. Fem hål gick bra men i det sjätte hålet gick gängtappen av (SBK!!) Hur skulle man få ur den? Den satt 1 mm under kanten och gick inte att pilla ur... Efter en natts funderande kom jag fram till denna metod:



Då det finns tre uttag (urfräsningar) i en gängtapp kollade jag hur grov pianotråd som fick plats där och svaret blev 0,4 mm vilket gjorde att jag klippte till tre st 2 cm långa bitar. Dessa stoppades sedan ner i den avbrutna tappen (se bild).

Nästa steg var att göra en 5 mm lång aluminiumhylsa och gänga den med M2 invändigt (utan att bryta av tappen!). M2-tappen skruvades ner i hylsan så att den precis stack ut, trädde i de tre trådarna och sköt ner alltihop så nära den avbrutna tappen som möjligt. Sedan lirkades alltihop fram och tillbaka tillsammans med lite smörjmedel och värme. Och vips så gick det att gänga ur den avbrutna tappen. Så nu är jag redo att ge Er alla en match i både Weatherman och F2A igen!

Per Stjärnesund

Gurney Flaps - Något för Stunt?

Det är Ingemar Larssons fel - att jag började med linflyg igen efter att slutat 1984. Ingemar fick fatt i mig under pandemin och lurade in mig i ett Weatherman-projekt. Med den äran! Då var det kört. En gång linflygare alltid linflygare. På tävlingarna träffade jag förstås stuntflygare och jag hade en komplett nybörjarmaskin hängande i garaget, vilken jag lärde mina barn att flyga med för 20 år sen. Tänkte jag kunde testa igen. Den dammades av och provflögs. Men den flög förfärligt. Kunde knappt göra stora loopingar. Irriterande - så slängas skulle den.

Men - varför inte försöka att få ordning på den? Tester gjordes med att flytta tyngdpunkt, öka höjdrodrets storlek, minska vikten, minska propellerdiametern, sätta på vinglets, öka ytan med fastejpade fasta flaps och allt jag kunde komma på. Viss förbättring nåddes men nöjd blev jag inte. Så dags för grovsoporna.

I sista stund såg jag ett inlägg i en linflyggrupp på FaceBook där ett gäng, på USA:s östkust tror jag, flög profilstuntare utan rörliga flaps men med konstiga små balsalister limmade på vingens bakkant. Och som hävdade att de flög kantiga manövrar utan problem. Listerna kallade de Gurney Flaps. Just Gurney Flaps hade jag kommit i kontakt med året innan då jag byggde mig en friflygande modell i Peanut-skala av en Cosmic Wind (den kan det läsas om i årets Julnummer av AoH). Sven Pontan överöste mig av tips och GF (Gurney Flaps) dök upp i ett av dem. Men i friflyget används de på ena sidan av en vingyta, fena eller stabilisator att justera flygriktningen i någon eller alla av de 3 axlarna flygplanet rör sig kring. Små 1,5x1,5mm balsalister med självhäftande tejp. Ett enkelt och smart sätt att trimma. Och funktionen är lätt att förstå. De agerar som små enkla trimroder. Men killarna i USA hade dem på båda sidor om vingens bakkant. Hur kan de ge ökad lyftkraft både i loop och bunt? Som ju krävs i Stunt. Det verkade superkonstigt.

Sagt och gjort. GF skars till i 3x3mm balsalister och fästes längs vingbakkanten med självhäftande tejp på de med aluminiumtejp redan dit-tejpade fasta flapsen. Första flyg-



De första listerna av 3x3 mm i balsa på de fasta flapsen.



25 mm höga lagårdsdörrar!

ningen gick superlångsamt, listerna verkade bromsa modellens framfart väldigt mycket och inga manövrar kunde göras. Varvtalet ökades och nu kunde maskinen flyga loopingar! Dubbla lager tejpades på, nu 6mm höga på var sida, varvtalet höjdes ytterligare, och nu kunde kärnan kanta! Jag fortsatte att öka tills GF var totalt 25mm höga. Rena laggårdsväggar som stod rätt upp i färdriktningen. Motorn gick skrikande på fullskaff men kanta kunde den! Helt galet.

Senare på våren fick jag för mig att på ställa upp i Semistunt i Karlskoga där jag ändå skulle flyga Weatherman. Samtidigt funderade jag på hur dessa GF skulle kunna göras lite snyggare och på ett sätt att de kunde varieras för att hitta rätt i flygegenskaperna. Ett självklart sätt vara att printa dem i en 3D-skrivare som mindre enheter. Med olika höjd. Att skjuta på dem på bakkanten och att



Gurney Flaps gjorda för 3D-utskrift.

enkelt fästa dem med genomskinlig smal kontorstejp så de även lätt kan tas av. Ett gäng olika GF printades och flygutprovning med olika kombinationer och höjder gjordes så lagom egenskaper för Semistunt-programmet erhöles (endast runda manövrar + trekant). De fasta flapsen kunde tas bort och ersättas med bara GF. Tävingen gick över förväntan då jag vann. Att GF funkar kan Niklas Löfroth bekräfta. Han provflög min röda maskin med och utan GF vid tillfället. Han kraschade den utan GF (kärnan klarade sig dock fint).

Till hösten skulle SM hållas i F2B. Under sommaren började tanken växa fram att prova om det inte skulle gå att få denna enkla lilla profilstuntare att även klara F2B-programmet. Genom att jobba vidare med GF-konceptet. Fler 3D-printade varianter av GF gjordes och testades i omgångar i olika kombinationer. Ju mer GF som monterades ju mer fick jag jobba med motorn för att få ut den kraft som behövdes. Det slutliga alternativet som valdes genom en mängd testflygningar var rejält höga GF inne vid kroppen och allt lägre GF ut mot vingspetsen. Kanske de simulerar avsmalnande flaps eller tom en avsmalnande vinge? Många andra tester med tankar, förgasare, propellrar, linlängder och bränslen gjordes också samtidigt. De har gett andra intressanta lärdomar. Så småningom hittade jag fram till en kombination som funkade bra och F2B-programmet kunde övas in igen efter 39 års frånvaro. SM-tävlingen i Västerås genomfördes i hård vind men kärnan klarade uppdraget bra, tog sig igenom 3 mycket jämna flygningar som jag inte skäms för. Sist kom vi inte heller.



Gurney Flapsen fästs på vingen med vanlig kontorstejp.

Funktionen hos GF monterad på endast ena sidan kan ju lätt förklaras med att den lilla "flärpen" avlänkar luften som ett (dåligt) roder eller flaps. Men när man ser dem sticka upp både uppåt och nedåt tycker man ju att de borde ta ut varandra. Jag har under friflygtävlingarna med min Peanut-modell haft glädjen att träffa en aerodynamiker som jag diskuterat detta med. Först med mycket tveksamhet men när jag stod på mig om den praktiska goda funktionen enades vi om en tanke att den GF som befinner sig på "fel" sida (t ex på vingens ovansida i en looping) hamnar i en "turbulens-skugga" i den avlösta luften på vingens ovansida, längre bak mot vingens bakkant (framförallt på en vinge med dålig profil). Och GF:en på vingens undersida då fungerar som om den på ovansidan inte fanns. En enkel och lättförklarad teori. Men fungerar gör det.

Vilka nackdelar finns då i att använda GF?

- GF alstrar mycket luftmotstånd. Ju högre ju mer. Även vid planflykt. Kanske framförallt där. Pga detta krävs mycket mer motorstyrka.
- Glidet i landningarna blir mycket kort pga det högre luftmotståndet.



GF-konfigurationen vid SM.

- Accelerationen i starten blir kraftigare men lugnar snabbt ner sig ju mer farten ökar (luftmotståndet ökar ju i kvadrat till hastigheten)

Vilka fördelar finns med GF?

- Mycket enklare modeller kan byggas och flygas utan rörliga flaps.
- Motorn kan gå på fullfart utan speciell "Stuntgång". Vanliga motorer kan användas.
- Modellen accelererar inte nedåt pga allt extra luftmotstånd



Höga GF vid kroppen och lägre GF ut mot vingpetsen.

- Modellen varvar inte upp farten i manövrarna av samma orsak
- Jag kan tycka att planflykten är mycket stabil (trots eller på grund av att stabben sitter i turbulensen bakom GF).
- ??? Det finns mer att upptäcka.

Vilka andra egenskaper framträder att ta hänsyn till med GF?

- Det känns som om approachen med en ny modell är att låta motorn gå på fullfart och sedan bromsa ner flygfarten med allt större GF tills en balans uppstår. Sedan öka/minska motorkraften och parera med mer eller mindre GF tills man hittar rätt.



En simpel skiss i ett försök att förklara den dubbelsidiga GF'ens funktion.



Här är konstruktionen och fastsättningen i en 3D-ritad version.



Ännu en 3D-ritad vy..

En spännande resa har det varit. Och helt säkert finns mycket mer att upptäcka och utforska med Gurney Flaps. För mig har det gett mersmak. Den lilla röda fick såklart ganska snart smeknamnet Gurney Ghost. Och till 2024 är Ghurney Ghost-2 på gång som en mer fullstor F2B-modell för att ytterligare utforska möjligheterna med dubbelsidiga Gurney Flaps för Stunt och F2B.

Läs mer om Gurney Flaps, hur de funkar, och hur de kom till, på : https://en.wikipedia.org/wiki/Gurney_flap

Inlägg om testerna av GF för Stunt kan läsas på: <https://www.slis.org/forum/viewtopic.p>

Johan Rasmussen



15th International Melusin Tournament

Odd years are traditionally those when the Cercle Modéliste Rullicois welcome modelers from many countries to compete in the Mélusin International Tournament, in the classes F2A, B, C and for the first time G (electric speed). The competition took place on June 10th/11th in excellent weather conditions. Let us first send thanks to the Mayor of Rouillé for welcoming the competitors and officials on Friday at the Town Hall. The CMR club had selected judges recognized by all and from different countries. In F2B the Judges came from Belgium, Italy, Spain and France while in F2C/F2F, the Judges were English, Dutch and French.

In addition to the European competitors (Belgium, Switzerland, Italy, Portugal,

Ukraine and France) we had the pleasure of welcoming Bill Hughes (USA) in F2A and Frank Battam (Australia) in F2B. Various impediments and health problems among the F2C teams forced the organizers to cancel this category which had had great success during previous years.

In F2A, 6 pilots competed and victory went to Anthony Rostislavov (297.2 km/h) ahead of Bill Hughes (294.2 km/h) and Matthieu Perret (289.8 km/h). The Aerobatics (22 competitors) saw Marco Valliera win ahead of Andreï Yatsenko by a few points, the third podium place going to Nicolas Chapoulaud. Note the first participation at this level of competition of Thé Charon aged only 9 years old. The F2F (4 competitors) was won by

the brothers Pascal and Bryce Surugue and in F2G, a new track record with a victory for Guy Ducas (SUI) flying 306.7 km/h, followed by Matthieu Perret (FRA) 274.5 km/h and then Daniel Janan (FRA) 232.5 km/h.

The Saturday evening banquet was, as usual, very appreciated and we must thank the officials for their effort to make this great competition a success. The 16th edition of the Mélusin International Tournament should take place in June 2025!

Serge Delabarde FRA



Kommer Ni ihåg ...

Limfjordstävlingen 1975

1975 var andra gången vi besökte Aalborg och Limfjordstävlingen (första gången var 1974) och suget från svenskar att åka hit var stort vilket vi sett under årens lopp fram tills idag. Hyfsat lätt att ta sig till Danmark och lite internationell touch gör väl sitt till. På 70-talet tävlade Stena Line och Sessan om att locka resenärer vilket gjorde att paket med färja och hotell var hyfsat billiga. Under de ca 40 år vi åkte till Aalborg (numera är det Herning som gäller) tror jag vi bott på de flesta hotell i Aalborg och det har varit ömsom vin och ömsom vatten.

Detta år var vi 6 billaster med förväntansfulla som korsade Kattegatt för att tävla i Combat och Stunt plus Claes-Olof Kall som vi övertalade att följa med som stuntdomare. Det skulle dröja ytterligare något år innan vi lyckades locka med oss speed- och team-flygare men när vi väl gjort det blev de också ett stående inslag vid tävlingen.

På lördagkvällen var det gemensam spising i klubbhuset med tillhörande lottförsäljning där diverse (o-)nyttiga saker kunde vinnas. Detta år blev Alf Eskilsson den ende av de svenske som vann och kunde återvända till hotellet med lim och öl i bagaget.

Ingemar Larsson



Niels-Lyhne Hansen var yngre 1975 än han är idag! Det var kanske därför han orkade flyga både Speed, Goodyear Racing, Team Racing och Combat.



Det fanns även tid till att njuta av det danska solskenet. Här sitter Erik Huss, Ingemar Larsson, Inga-Lill Eskilsson, Claes-Olof Kall, Torbjörn Hansson, Klas Brobeck och Conny Åquist.



Ett bestående stuntminne från 70-talets Danmark är att alla stuntmodeller var stora och röda.



Erik Huss och Ingemar Larsson slappar i depån ihop med sina modeller.



Conny Åquist flög F2B med sin OS35-bestyckade gröna Nobler.



Dan "Läppen" Johnsson från Vänersborg flög Combat med sin Supermonger.



1975 fanns bara det lilla klubbhuset (som senare blev kök/kontor). Något nät kring asfaltcirkeln var heller inte på plats.



Alf Eskilsson gör sig klar för start.



Att bilden är tagen på väg hem kan man tydligt se på alla vita plastkassar... Vad kan de innehålla? Här njuter Erik Huss, Margareta Huss, Alf Eskilsson, Ingemar Larsson och Conny Åquist av det sköna vädret på soldäck.

Resultat Limfjordstävlingen 1975

F2B Stunt:

1. Leif Eskildsen	DEN	5848 p
2. Alf Eskilsson	SWE	5273 p
3. Erik Huss	SWE	5174 p
4. Leif Mortensen	DEN	5054 p
5. Conny Åquist	SWE	4325 p
6. Dick Jonefeldt	SWE	4100 p

Goodyear Racing: (alla DEN)

1. Bisgaard/Mortensen	5.34	11.22
2. Nielsen/Nielsen	6.53	62 v
3. Lyhne-Hansen/Pedersen	5.41	42 v
4. Geschwendtner/Petersen	7.15	

F2C Team Racing: (alla DEN)

1. Geschwendtner/Petersen	4.39	9.09
2. Hasling/Hasling	4.34	9.13
3. Poulsen/Christensen	5.02	9.30
4. Thomsen/Vammen	5.02	
5. Sejersen/Edslev	5.05	
6. Bisgaard/Mortensen	5.34	
7. Schou/Kruse	5.38	
8. Windberg/Nielsen	5.40	
9. Nielsen/Rasmussen	6.09	
10. Lyhne-Hansen/Pedersen	6.58	
11. Rivold/Boberg	0	

F2A Speed: (alla DEN)

1. Leif Eskildsen	226,4
2. Leif O Mortensen	210,5
3. Ole Poulsen	203,3
4. Aage Thorhauge	160,8
5. Niels Lyhne-Hansen	129,5

Begynderstunt: (alla DEN)

1. Jörn Rasmussen	2555 p
2. Henry Hviid	2371 p
3. Morten Kruse	2106 p
4. Elmer Nielsen	1091 p

F2D Combat:

1. Jörn Rasmussen	DEN
2. Henrik Linnét	DEN
3. Erik Huss	SWE
4. Kurt Pedersen	DEN
5. Niels Lyhne-Hansen	DEN
6. Jörn Veien Nielsen	DEN
7. Per Hansen	DEN
8. Dan Johnsson	SWE
9. Asger Bruun Andersen	DEN
10. Uffe Edslev	DEN
11. Ingemar Larsson	SWE
12. Klas Brobeck	SWE
13. Kent Rudström	SWE
14. Anders Dahlöf	SWE
15. Björn Regnström	SWE
16. Jens Geschwendtner	DEN



Ib Rasmussen med sina modeller i Team Racing.

Lassogeier Luftzirkus

I must start with saying that the Weather wasn't on our side! This started on Wednesday after it had rained incredibly in the previous days. On Wednesday morning I went to the flying site, had the Keeper of the ground to give me a brief introduction to the lawn tractor and then cut half the field (140 m x 80 m) very short. Things went well until noon! The sky was overcast and it was windy but as Axel Jungerz was warmly dressed with a hat and although the lawn mover went slowly it all went smooth. Afterwards, every bone I could feel hurt. The lawn mower had no suspension and I only discovered the hearing protection behind the driver's seat after the field was cut.

They classes we planned to fly were Mini-Combat (1/2 A), Mini-Teamrace (1/2 A), Scale, Oldtime-Stunt, Limes Racing (analog to Goodyear racing), Cox Racing, Acrobatic for Beginners and Jedermann-Fliegen (Flying for Everybody who want to test C/L flying),

Then it started to rain and I quickly drove the 20 km to home. It rained like hell during the night! Back to the site on Thursday morning, in a light drizzle, and cleaned the clubhouse. Atnoon the sun came out and the lawn was dry enough that I was able to cut the second half. I then marked out the flight circles, checked the solar system and the electrics and then



Ready for Mini-Teamrace.



Mini-Combateers.



Franz Weigl flew in Limes Racing.



Airfield at the Aeroclub Rheidt.



After 20 years it was the last Lassogeier-Luftzirkus as a competition but not the last C/L-zirkus as it will continue in the future.



Racing Models of Aaron and Willi Schmitz



Norbert Schmitz with guests.



Aaron, Andreas and Katja planning strategies.

went home again in the early evening. The first participants had already arrived.

Of course it rained so much from early evening until early Friday morning that I packed my rubber boots straight into the truck. In the morning we loaded the truck (it's amazing how much everything fits into a Mercedes Sprinter and what we needed for the Luftcircus!), off to the site and unpacked into the clubhouse. With my colleague Timmermann from Hamburg, who thankfully walked around the area taking photos, set up the flight circles, put up the barrier fences and spruced up the clubhouse veranda, cleaned the grills and installed the water supply.

Then it was finally time for the first fuel discussions. During this time, Anja finished what was needed to serve refreshments and put our offerings into refrigerators and cupboards.

We then returned home around 7 p.m. on Friday evening to give our battered bodies a hot shower, finish the prepared cakes with chocolate and lemon icing and put the remaining food and model aircraft supplies into the truck. And of course it rained so much on the night from Friday to Saturday that I stood at the window and thought: "No, young heart, it won't work anymore!!" I was totally frustrated and thought about getting my big candle back from Cologne Cathedral - intended for Sankt Peter! But then I didn't and I say: St Peter is corrupt!

On Saturday morning under an overcast sky, we went to the square, the registrations were sorted out and the 50 liters of coffee we had brought with us were set up for breakfast (we had already picked up the fresh rolls that we ordered from the bakery in the morning) and there were already 30 people (out of 37 registered) sitting waiting.

And then the sun rose!!!! You won't believe it, but my mood was just as high as a youngster getting his driver license. And everyone now believes in the story about St Peter and the candle!!

Sun and a bit of stiff wind made the first competition flights very interesting. The general atmosphere was really great and the evening barbecue and the barrel of Gaffel Kölsch (beer!) were the ideal and desired highlight of the event on Saturday. Anja and I were already lying in bed pretty exhausted at 11 p.m.

Results

Mini-Teamrace

1. Unruh, R / Welter, A	GER	15.26,15
2. Weigl, Fr / Schmitz, W	GER	16.53,90
3. Odeyn, J / Schmitz, A	BEL/GER	15 laps

Cox Mouse Racing

1. Gibeault, P / Schmitz, N	CAN/GER	6.12,24
2. Ritter, K / Schmitz, A	GER	107 laps
3. Odeyn, J / Selic, K	BEL/GER	0 laps
- Thier, T / Schulze, R	GER	-
- Weigl, Fr / Schmitz, W	GER	-

Limes Racing

1. Gibeault, P / Schmitz, N	CAN/GER	7.24,07
2. Odeyn / Ritter / Aaron	BEL/GER/GER	7.53,08
3. Weigl, F / Schmitz, A	GER	10.10,60
4. Schmitz, W / Schmitz, A	GER	-

Old Time Stunt 1

1. Odeyn, Jan	BEL	Modell "Kandoo" Motor PAW 1,5
- Schmitz, Willi	GER	Withdrawn, Technical Problems
- Coll, Jorge	ARG	Withdrawn, Health Problems

Old Time Stunt 2

1. Kappler, Ulrich	GER	Modell "Nobler" Motor OS 40 FP
2. Leja, Helmut	GER	Modell "Rundwirker" Motor OS 25 FP
- Coll, Jorge	ARG	Withdrawn, Health Problems

Control Line Scale

1. Willmer, Peter	GER	"Piper Chokee PA 28" Motor Kerison 50
2. Schwarz, Günter	GER	"FW 190 A 8" Motor PH 61 (Technical problems)
3. Schmidt, R	GER	"PT 17 Stearman" E-Motor (Technical problems)
4. Krafft, Karl Georg	GER	"Cessna GC-1" Motor Saito 72 (Technical problems)

Mini-Combat (Deutsche Meisterschaft)

1. Unruh, Rafael	GER
2. Welter, Alex	GER
3. Wolpertinger, Ivan	GER
4. Thier, Thomas	GER
5. Usala, Nino	BEL
Bukin, Marat	GER
7. van Doninck, Dirk	BEL

Lassogeier



Mini-Teamracer
with TYR 0.9.



Mini-Combat



Cox Mouse Racer after a hard landing.



Ulli Kappler's ARF



Prizegiving: Helmut L, Axel J and Jan O.



Prizegiving: Sebastian K, Katja R, Axel J
and Klaus S.



Prizegiving: Sebastian K, F
Norbert S, Katja R, Jan O a

Photos by:
Jürgen Heilig, Jörg
Timmermann, Axel
Jungherz and Rainer
Schmidt.

Luftzirkus



of Alex Welter.



F Nobler.



Franz W, Paul G,
and Aaron S.



Hard landing in
Cox Mouse Race.



Jan Odeyn's Kandoo.



Franx Weigl's Cox Mouse Racers.



Paul Gibeault came all the way
from Canada and flew Cox Racing.

Start early on Sunday morning, first to the bakery, then breakfast with the participants. Afterwards we did our traditional C/L flea market and then the next competition flights. We were finished at 3:15 p.m. sharp on Sunday and at 4 p.m. the participants were allowed to travel home (early enough) after everyone, really everyone, had won prizes and thank-you gifts.

We had Paul Gibeault from Canada with us again, who couldn't contain his enthusiasm throughout the whole event, as well as an Argentinian, a Belgian, a Dutchman and a Bavarian. Cleaning up the course, cleaning the clubhouse and putting everything back in order was relatively quick.

The subsequent loading of the truck was a major effort for all of us, especially as the entire organization team began to experience stomach and intestinal problems, which forced Anja, Andreas Hoffmann and me into bed for the entire following week; We were all totally exhausted! Only Pia and Clara Schmidt, who insisted on helping on Sundays, despite Christoph's death in October last year, were spared the virus.

After 20 years and 10 exhausting Luftcircus events, this was also the last one in Axel Jungherz's history, but not the last C/L event in Niederkassel. We want to continue, but no longer as a competition, instead as a meeting and advertising for the C/L community according to the motto: Fly until the lights go out! Around and around!



■
Axel Jungherz
GER

The Mills Diesels - A Production History!



Adrian Duncan is a 76 year old modeler living in Canada. One of his main interests is Models/ Model Engines and he runs a very informative web site.

This time we have chosen the story of the British Mills engines. The full article and even more articles can be found at Adrians web site <http://adriansmodelaeroengines.com>.

The original Mills Brothers (Model Engineers) company was based in Sheffield, South Yorkshire. The firm was established by the three Mills brothers Bert, Frank and a third whose first name is not recorded. The company actually had its origins as far back as 1913, the objective being to enter the model railway manufacturing business. However, the onset of WWI put a premature stop to any such ambitions, at least in the short term. The Mills brothers reportedly all volunteered for military service, setting their commercial ambitions to one side.

Following the conclusion of WWI, which all three survived, the Mills brothers resumed their efforts to develop their model railway business. At the outset (and for many years thereafter) the firm had nothing to do with model engines, instead manufacturing O-gauge tinplate model railway equipment including locomotives, track and accessories at their St. Mary's Road location in Shef-



The Episcopes.

field. These products were marketed under the "Milbro" trade-name. The company also manufactured such diverse items as "Episcopes" (optical devices for projecting photographs onto walls), pumps for the brewing industry and even military buttons! They advertised some of their products in popular publications such as the "Meccano Magazine".

In 1938 Mills Brothers secured premises at 2 Victoria Colonnade, Southampton Row in Holborn, London to serve as a showroom and retail outlet for their model railway products in the major market area of London. Model boats and model airplanes were very quickly added to the range of goods on offer.



Milbro advertisement.

This shop was to play a central role in the Mills model aero engine story, as we shall see. It was managed by two presumably related associates of the Mills brothers named R. M. and E. R. Spofforth. The actual manufacturing continued to take place in Sheffield. The new London outlet was located in surprisingly upmarket premises, being housed in the ground floor of a large neoclassical building known as Victoria House which had been completed in 1932. Victoria House occupied an island of land lying between Bloomsbury Square and Southampton Row. The Mills Brothers shop occupied one of a number of retail bays located on the ground floor of the side facing Southampton Row. It was this line-up of retail premises that was collectively known as Victoria Colonnade. The company promoted their new business outlet quite actively, as reflected in the promotional sheet seen below. This must date from shortly after the opening of the new premises.

Naturally, the onset of WW2 in September 1939 had a profound impact upon small engineering firms such as Mills Brothers. British industrial resources were firmly re-directed towards war-related production, to the extent that the manufacture of model railway equip-

ment was actually banned in 1941 and even its retail sale was banned in 1942! Presumably Mills Brothers engaged thereafter in war production, although no details are presently available. Victoria House survived the WW2 Blitz, although it was a near thing - the buildings on the opposite side of Southampton Row were all destroyed by the bombing. The Mills Brothers shop continued in operation after the war, adding the Mills model engines to the model railways, aircraft and boats in 1946. Reportedly, all Mills engines sold at this location were tested on the premises, doubtless to the great annoyance of the occupants of the adjacent business spaces!

The individual who diverted the attention of Mills Brothers away from model railway manufacturing into the model aero engine field was Arnold Lewis Hardinge, a London-born son of a German father named Walter Neumeister and an English mother. Immediately following the conclusion of the war, Hardinge entered into an association with Mills Brothers, who were once again engaged in the manufacture of model railway equipment at the time. However, Hardinge's attention had already become fixed upon the emerging field of model diesel engines, to the extent that he soon persuaded Mills Brothers to support his plans to add this line of products to their range. After making a number of experimental prototypes, Hardinge took out his first Patent with respect to model diesel transfer systems in May 1946.

Visit our New London Showrooms



THE MOST MODERN AND UP-TO-DATE ESTABLISHMENT OF ITS KIND IN THE BRITISH ISLES

2 VICTORIA COLONNADE, VICTORIA HOUSE, SOUTHAMPTON ROW, W.C.1,

which adjoins Kingsway, and is about two minutes' walk from Holborn (Kingsway) Station of the London Underground Railway. Bus Nos. 77, 77A and 68 stop at the door, also the L.C.C. trams (Kingsway) pass within sight of the Showrooms. It is also within easy reach of all the main line terminal stations, and of the West End. A comprehensive range of Model Railways, Tanks, Accessories, Ship's fittings, both assembled and in parts, are carried in the magnificent Showrooms, and a competent staff await to give you every help and advice appropriate to all descriptions of model making, whether you make a purchase or not.



PAY US A VISIT

YOU WILL BE INTERESTED

Opening promotion.

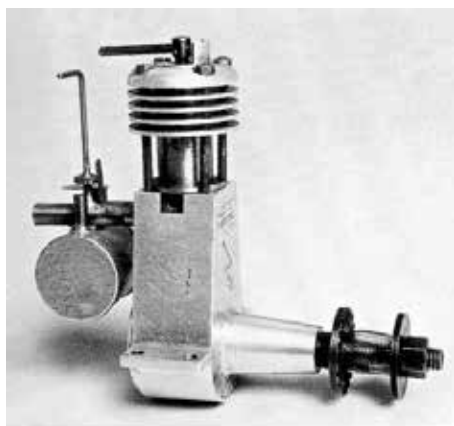
Shortly thereafter, the initial examples of the Mills 1.3 Mk. 1 Series 1 diesel appeared on the market, being first advertised in July 1946. At this stage, Mills Bros. were citing the Southampton Row location in London as their business address. E. Keil & Co. Ltd. were appointed as the trade distributors for the Mills model engine range, an arrangement which continued up to late 1949.



Arnold Lewis Hardinge.

This appears to be an appropriate point at which to interject a hitherto largely ignored and perhaps controversial matter in relation to the design origins of the Mills 1.3. This is the very strong likelihood that Arnold Hardinge's design was based to a very significant extent upon that of the earlier Allouchéry 1.25 cc sideport diesel from France.

The response of the modelling community to the release of the Mills 1.3 was immediate and overwhelming. Quite apart from its inherently excellent handling and running characteristics as well as the quality of its construction, it had virtually no domestic competition as of mid-1946. Consequently, demand far outstripped supply right from the outset. In response to the immediate sales success of the new model, steps were quickly taken to enhance the company's model engine production capacity – the Sheffield facilities evidently lacked the capacity to maintain the simultaneous production of both the ongoing "Milbro" model railway range and the new Mills model diesel. This almost certainly explains the fact that relatively few of the original Mills Mk. 1 Series 1 models appear to have been manufactured – the Sheffield factory in which they were most likely produced simply didn't have the surplus capacity. Supply doubtless fell behind demand to an ever-increasing degree.



Allouchéry 1.25 cc.

This unsatisfactory situation was relieved in late 1946 with the establishment of a new manufacturing operation at 143 Goldsworth Road in Woking, Surrey, in premises which had formerly housed a builder, plumber and decorator. As Mills Brothers' resident model diesel expert, Arnold Hardinge was quite logically appointed as manager of this facility.

According to Reg Elton, an early employee at the Woking location, this facility produced the crankcases and cooling jackets in addition to some of the other less demanding components. The assembly and testing of the engines also took place at this location, a fact which subsequently led to noise-related conflicts with the neighbours given the inconvenient fact that the premises backed onto a residential area!

However, many key components continued to be manufactured elsewhere, with crankshafts apparently being sent down from Sheffield and the cylinders being produced by the Precision Reed Company of Crawley in Sussex. The business affairs of the company continued to be handled through the Southampton Row location in Holborn, while KeilKraft retained their role as trade distributors.

MILLS DIESEL'S $\frac{1}{3}$ C.C.

AN ENGINE OF HIGH PERFECTION AND PROVED OUTSTANDING PERFORMANCE, FOR UPRIGHT AND INVERTED RUNNING

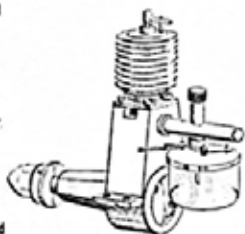
Range: 5000 to 7000 R.P.M. with 11" to 9" Airscrew.

Total Weight. 4½ ozs.

Quick-action Cut-out for connection to Flight-timer.

The "DIESEL" saves the weight of Battery, Coil, Condenser and Plug.

The superior steels selected ensure lasting performance



Price: £5:5:6 (INCLUDING AIRSCREW)

MILLS BROS · MODEL ENGINEERS · LIMITED,
2 VICTORIA COLONNADE, SOUTHAMPTON ROW,
NOL 9830 LONDON W.C.1
AND E. KEIL & CO LTD, LONDON, E.2: WHOLESALE ONLY.

First Mills ad - AM July 1946.

For some years after their entry into the model engine field, Mills Bros. hedged their bets by continuing to manufacture their "Milbro" line of model railway track and accessories in Sheffield alongside the Woking-based production and expansion of their very successful model engine range. The attached image of a 1949 Mills Brothers trade show stand proves that both model diesel engines and model railway material were still being manufactured and promoted at that time. The model railway manufacturing was still taking place at the Sheffield factory – the illustrated display confirms that the company retained its Sheffield and Holborn branches alongside the Woking facilities, since all three are mentioned.

However, things changed radically in late 1949 when Arnold Hardinge bought the Mills Brothers business (or a portion of it) outright. From that point onwards, his focus switched decisively to model diesel engine production. It's interesting to note at this point that the Mills Brothers shop on Southampton Row in Holborn remained in operation until at least 1955 – possibly longer. It's not known when Mills Brothers finally abandoned these premises. What is known is the remarkable fact that these premises are still in existence today! Victoria House became a Grade II listed building in 1990 and has since been extensively modernized internally, although its external appearance has been left largely unchanged. The retail bay on the Southampton Row side of the building which once housed the Mills Brothers showroom is still there, although it has been internally reconfigured to suit other purposes. In the accompanying image, the former Mills Bros. shop occupied the second narrow bay from the left (behind the lamp standard).



1949 Mills Trade Show Display.

It would appear from this information that what actually happened in late 1949 was that Arnold Hardinge bought the Mills Brothers (Model Engineers) name from whoever owned the company at the time (probably one or more of the original Mills brothers) along with the exclusive manufacturing rights to the Mills model aero engines by that name. He also acquired the Woking premises at which the engines were made. This is completely consistent with the previously-noted fact that the Mills brothers had started the company on the specific basis of an interest in model railways, hence likely viewing the model aero engine side as being somewhat peripheral to their interests in addition to being carried on at an inconveniently remote location (Woking). They were probably happy to let that side of the business go so that they could devote themselves full-time to model railway manufacture in their native Sheffield under a slightly changed company name.

Regardless of what actually transpired, from late 1949 onwards Hardinge focused exclusively upon model diesel engine production at the Woking facility which he now owned. From this point onwards the business affairs of the company were also handled from the Woking address. This included the wholesale distribution of the engines to the model

trade, thus ending the former association with KeilKraft. No more was heard of the Holborn retail outlet in connection with the Mills diesels, although it remained in business as an outlet for the ongoing products of the Sheffield company and may have continued to sell the Mills engines on a retail basis.



1950 Mills ad for all three models.

The Mills diesels ended up being manufactured and advertised in three displacement categories – 0.75 cc, 1.3 cc and 2.4 cc. The 2.4 cc model was not a success, being outclassed by a number of more powerful and less expensive competing models. It only remained on offer until mid 1951. However, the flagship .75 and 1.3 models continued in production for many years thereafter in their fully developed forms.

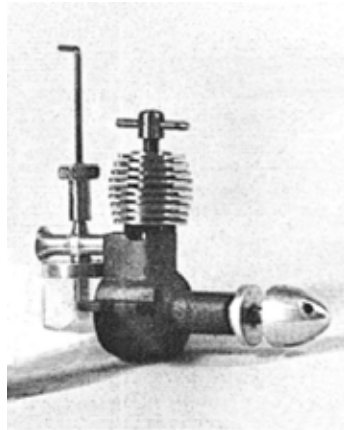
Things continued in this manner throughout the nineteen-fifties. In 1960, Mills Brothers (Model Engineers) Ltd. was acquired by the Ayling Industries Group. At the outset the new owners stated their intention to continue production and even pursue the expansion of the Mills model engine range.

For a time, it appeared that this intention might actually be fulfilled, at least in terms of continued production. Arnold Hardinge remained as plant manager to oversee the ongoing manufacture of the .75 and 1.3 models which he knew so well. However, model engine production was finally terminated in 1964 in order to free the company to apply its resources to the more lucrative aviation market which had been exploited earlier by Hardinge. As far as can now be determined, Arnold Hardinge retired from the company at this point.

In fairness to Ayling, it must be admitted that production figures for the Mills range had almost certainly fallen off considerably by this time. The engines were undoubtedly well into their transition from mainstream status to the “cult” category at this point. Even so, they continued to be widely (and justifiably) regarded as the ideal beginner and sports engines.

A significant factor in reducing demand was doubtless the fact that the Mills engines were unusually durable, tending to last forever in service. Consequently, many of the tens of thousands of engines that had been manufactured remained in service or readily available in good condition on the second-hand market at the time in question (just as they still do today, albeit at somewhat higher prices!). Those who wanted one could readily fill their needs by looking to that market rather than buying new.

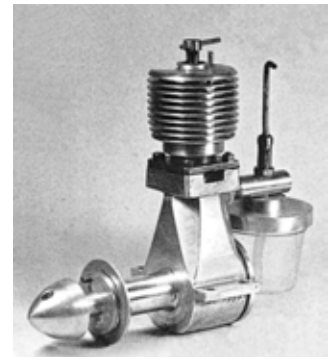
Thankfully, this unhappy event was very far from being the end of the Mills story - in fact, in many ways it was only the end of the beginning! When Ayling ended all Mills production, the remaining factory spare parts inventory was taken over in whole or in part by an entity called Woking Models, who continued to supply new original parts for some time thereafter. However, there's no evidence that Woking Models assembled any complete engines. Indeed, they may have been acting merely as a retail outlet to help Ayling to dispose of a redundant asset.



Mills 0.2 cc prototype.

Even before production at their Mills Brothers subsidiary ended, Ayling had already been looking for a buyer for their model engine manufacturing interests. In April 1963 an expression of interest was received from Mr. Suresh Kumar, a businessman, manufacturer and keen modelling enthusiast from Calcutta, India. Following a fairly lengthy period of negotiation, the surviving dies, designs, drawings, production fixtures, tooling and parts inventory were finally acquired by Mr. Kumar in early 1965. Mr. Kumar also acquired the exclusive worldwide right to the use of the Mills name. At around the same time he also acquired rights, production equipment and parts inventory for the defunct Allen-Mercury (A-M) series as well as certain FROG models. He went on in 1969 to add the rights to the Taplin Twin to his list of acquisitions. His products were marketed under the Aurora name. Flying model kits were produced in addition to the engines.

At the outset, the Aurora Mills reproductions fell well short of matching the quality and durability of the Mills Bros. originals,



Mills 5 cc prototype.

although the better examples performed quite well, also retaining the easy starting and flexible operating characteristics of the originals thanks to their generally excellent piston/cylinder fits. Mr. Kumar worked diligently to address many of the problems with those early engines, the result being that the later examples were significantly improved. They served as a much appreciated stop-gap pending the many subsequent revivals which followed from numerous other manufacturers.

Mills 1.3 Mk. 1 Series 1

(July 1946 – c. October 1946)

This is the original 1.3 cc engine which was introduced in June of 1946. It was in fact one of the very first commercial model diesels to appear in Britain at a premium retail price of £5 5s 6d complete with airscrew. Although this was a rather high price at the time, representing at least a week's take-home wages for



Mills 1.3 cc Mk 1 Series 1.

an average individual in early post-WW2 Britain, the attractions of the engine were such that the company quickly found that it could sell all that it could bring to the market, and more. In fact, demand rapidly outstripped supply, forcing the company to make alternative arrangements for the engine's manufacture, as recounted earlier.

This introductory model featured a slab-sided aluminium crankcase with a plain brushed finish. The intake venturi was a straight parallel-sided screw-in tube which was secured by a lock-nut. A spring-loaded cut-out arm was provided.

This variant was distinguished from the later Mk. 1 Series 2 variant by its straight-finned

cooling jacket, which actually widened very slightly towards the top. Another distinguishing feature is the fact that the edges of the vertical portion of the crankcase were left "sharp" as machined. The edges on later models were generally rounded off by filing. Finally, the Series 1 engine also had a one-piece main bearing bushing as opposed to the two-piece bushing which was used in the following Series 2 variant.

Mills 1.3 Mk. 1 Series 2 (November 1946 – May 1948)

The timing of this variant's introduction seems to coincide very closely with the establishment of the Mills Bros. model engine manufacturing operation at Woking. In terms of its external appearance, the sole distinguishing features of this variant from its predecessor are the use of a revised cooling jacket having the top two fins turned to reduced diameters to give a "beehive" effect and the filing of the vertical edges of the crankcase. Both revisions were probably just a matter of "prettifying-up" the otherwise rather utilitarian engine.



Mills 1.3 cc Mk 1 Series 2.

The only other change of which I'm aware was a switch from a one-piece main bearing bushing inserted from the rear to a two piece design whose two components were pressed in from opposite ends. It's unclear whether or not there were any other internal changes, but it actually seems rather unlikely.

Mills 1.3 Mk. 2 Series 1 (June 1948 – November 1949)

This variant appeared in June 1948 to replace the previously described Mk. 1 Series 2 model. The design revisions which it embodied were principally developed by Trevor Wooderson, who also designed the companion 0.75 cc and 2.4 cc models.

The revised model exhibited several significant changes from the Mk. 1 designs described earlier. The most obvious of these was the cast and machined magnesium alloy crankcase with relieved sides and chromate blackening (often incorrectly referred to as black anodizing) to guard against corrosion. The use of a tapered intake venturi made of cast alloy was also a distinguishing feature. What set this variant apart from its Series



Mills 1.3 cc Mk 2 Series 1.

2 successor (see below) was the induction timing. The Mills 1.3 Mk. 2 Series 1 variant had its induction port set comparatively high in the cylinder wall, resulting in a relatively restricted induction period.

By the time that this model appeared, the model engine market had become far more diversified, with a wide range of competing models on offer. As a result, selling price was beginning to exert a considerable influence upon sales figures. The new Mills 1.3 variant sold at a price of £4 15s 0d, down from the £5 5s 6d figure which had been maintained throughout for the Mk. 1 Series 2 model discussed earlier. This was still a relatively high figure which was presumably made possible by the outstanding reputation which the Mills 1.3 had built up over its first two years on the market.

Mills 1.3 Mk. 2 Series 2 (December 1949 – mid 1964)

This was the second and more common variant of the Mk. 2 magnesium case 1.3 cc engines. It appeared in around December 1949. It was little changed from the Mk. 2 Series 1 variant, the main distinguishing feature being a lower induction port, a change which substantially extended the inlet duration. This change resulted in a 25% increase in power output according to Peter Chinn's test results.

This being the case, it's something of a mystery why it took Mills Bros. so long to come up with this very worthwhile modification. You'd think that they would have experimented with different induction periods during the development phase. This is by no means a trivial matter if you're considering acquiring a Mills 1.3 to use in a vintage model. The Series 2 variant is very noticeably more powerful than the Series 1. That said, I hasten to emphasize that both variants of the engine start and run extremely well. It's just that the Series 2 version provides a noticeable amount of extra "urge". If I had purchased a Series 1 variant just prior to the release of the Series 2, I'd have been a bit cheated off!

By the time that this variant appeared, cost had become an even more significant factor in terms of a given engine's sales performance as competing offerings from other manufacturers continued to proliferate.

Although the manufacturing processes and associated costs required to construct the new Mills 1.3 variant were essentially unchanged from those applicable to its predecessor, the manufacturers felt compelled to reduce the retail price to £3 15s 0d in order to remain competitive. It must be assumed that they absorbed the price reduction through the acceptance of a reduced profit margin. The blow was doubtless cushioned by the fact that the major development costs of the Mk. 2 must surely have been fully absorbed by this time through sales of the Series 1 variant at the higher price.



Mills 1.3 cc Mk 2 Series 2.

This was the final variant of the Mills 1.3, remaining in production right up to the end of the line in 1964, at which time it was selling at a modestly increased price of £4 15s 9d, an increase which more or less reflected the degree of inflation over the same period. If our estimate of the total production figure is anywhere near correct, the average production rate for this unit over its 14 year production life was only some 70 units monthly. Of course it was presumably far larger than this at the outset.

However, it's necessary to recall the fact that by the time this model appeared Mills Bros. had introduced the Mills .75 Series 2, which became an instant best-seller, hence absorbing a high proportion of Mills Bros.' manufacturing capacity. The ill-fated 2.4 model also remained in limited production at this time. Both of these factors would inevitably have diverted production resources away from the established 1.3 model. Furthermore, all the evidence suggests that the Series 2 variant of the Mills .75 quickly assumed a dominant position in the production and sales picture at Mills Bros.

Mills Bros. managed to produce perhaps as many as 92,000 engines during the 18 years during which they were active in the model engine manufacturing business. While nowhere near the kinds of figures managed by the far larger E.D. company during its heyday, the average monthly total of around 425 engines over the life of the range represents a significant accomplishment for the smaller firm.

/Adrian Duncan

Et år på vingene

Et annet år har gått og vinteren har kommet opp i nord. Nå er det tid for å revurdere sesongen og forberede til neste år. I år var det en liten sesong for F2C, som rakk over kun 3 uker med konkurranse. Men det har vært godt!

Vi startet i slutten av juni med dobbel konkurranse, Wierzawice & Lithuania cup i Wierzawice, Polen. Første reise til Polen for oss som lag. Noen av de få som ikke har vært der siden EM og VM ble organisert i Wloclawek/Czestochowa. Deltakere i F2A, F2B, og F2C kom fra de nærmeste landene for fire dager og kvelder, når vi feiret modellfly og gjestfrie polske organisatorer. Første konkurranse var for oss mest tuning av modeller. Guffy hadde reparert vår gule modell med Profi som jeg hadde kræsjet sist gang. Resultatet var ambisiøst til tross for « snapsen » som ikke hjalp Guffy med starten. Kort oppsummert ble det jevnt resultat, men rett under kvalifisering til semifinalen. Så etter-konkurranse var ganske rolig for oss og vi kunne nyte hotellet som organisatorene hadde booka. God husmannskost og eget bryggeri på plass er en oppskrift på fornøyde gjester! :) Alt i alt en veldig hyggelig konkurranse som viser fremtiden til modellfly, med Polen som samkjørte flere Junior i begge kategori. Vi ble rørt over et rent kvinnepodium på F2B, som kanskje ikke Guffy eller jeg har sett noensinne (også i andre idretter). Heia Polen!



Til tider må mekanikeren tilkalle piloten for å få hjelp.



Noen ganger skjønner man at man har blitt eldre.... For eksempel når man ser prisvinnerne i F2B junior i Polen.



Joanna Stoll (POL), Victoriano Hernandez (ESP) og Clement klare for heat.



Guffy er ansvarlig for alt motorarbeid.



Daniel Rota og Guy Ducas fløy F2G.



I Landres ble det også kjørt lin-skala.

Etter lange 10 dager på jobb for meg og i bil fra Polen for Guffy, møttes vi på Luxembourg Lufthavn for en full ettermiddag med trening i Landres før konkurransen. Alt var klart for en ny runde med løp og bedre « snaps » til starten. Vi fikk fine løp med ryddige lag, de som oss, var her for å gjøre: « den beste versjonen av seg sjølv ». Vi så løp som var mye mer aggressive og var letta for å ikke være i dem. Som vanlig ble det pølser til middag. Clement sørget for at alle på F2C fikk sin rasjon, og at Guffy fikk kaffe. Ved hjelp av franske lover, kunne jeg kjøre Guffy til hotellet sitt, selv med en liten belønningsdrink innabords.

Vår nærmeste nabobane på F2C var F2A, med mindre F2G (elektrisk speed). Og i år, til tross for APC-propell, Daniel Rota rakk en 327,0 km/t og vil snart teste begrensningen til Transitrace systemet.

F2C-banen ble også brukt til flyscore for F4B GPF-konkurranse med 6 deltakerne i år, 2 flere enn i fjor. Et velkjent ansikt vant i år; Heiner Borer fra Sveits.

Alle samlet seg til den berømte Landres-buffeten, som ikke var lett å rekke for oss i F2C på grunn av dårlig vær som forsinket mange av løpene på lørdag. Som Obelix sa i tegneserien « tout est bien qui fini bien ». Søndag var det prisutdeling presentert av Clement, en flink franskmann som snakker forskjellige språk (sikkert ? :D). Dessverre for oss var det tid for å si adjø til de fleste siden det var vår siste konkurranse i år i F2C. Vi møttes på Vanersborgpokalen senere da vi åpnet den første kampen sammen i sentrum. :)

Clement Bindel
NOR/FRA

F2D Motor-seminar



Der er over de sidste par år sket en udvikling inden for F2D (line-styret combat), det skyldes et nyt type gløderør udviklet af den tyske Rafael Unruh, samt en mere avanceret (og kritisk) kugleleje opsætning motoren.

I den danske F2D gruppe har vi nogle teorier om hvordan man sætter motoren korrekt op til de nye gløderør og hvordan man servicerer lejer med videre, men de har alle et "individuel twist". Det meste viden kommer fra vores egne erfaringer, men meget er også kommet fra de ældre (læs erfarne) piloter bl.a. deres test af USE-motoren tilbage i slutningen af 80'erne. Trods vores erfaringer ser vi stadig underlige og ulogiske ting ske med vores motorer i visse situationer – Der er altså noget vi ikke helt forstår. Så i sommers kom vi frem til at vi måtte have noget ekstern hjælp, men fra hvem?

Det logiske sted at starte er hos fabrikanten, motoren er en 2.5 ccm FORA gløderørsmotor fra Ukraine. Vi har et godt forhold til de 2 som står i spidsen for udviklingen og fremstillingen, men givet nuværende situation i Ukraine kunne det ikke lade sig gøre at få dem på besøg, ligesom sprogbarrieren ville have været en større hindring for hvor meget vi kunne lære. Næste valg var Rob Metkemeijer fra Holland, et navn som nogle uden tvivl har hørt før. Rob har haft mange berøringsflader inden for modelflyvning, især inden for "Team race" (F2C) og "Pylon race" (F3D og F3T). Hvor han både har designet og fremstillet motorer til begge klasser, og stadig i dag laver F3D motorer i samarbejde med Profi.

Den danske F2D gruppe har tidligere arbejdet sammen med Rob i forbindelse med test af udstødninger og støj, hvor vi kopierede et setup som Rob allerede havde designet til at teste udstødninger til pylon racing. Så han er ikke helt fremmed for os. Under F2-EM i sommers i Polen tog jeg fat i ham og forklarede ham vores motor udfordringer og spurgte om han ville være villig til at komme og undervise os specifikt med henblik på vores F2D FORA motor, hvilket han svarede ja til. Han fik en af mine konkurrence-motorer samt et håndfuld forskellige propeller med hjem til test og inspektion.

I slutningen af oktober kom Rob til København, vi havde gjort Pingvin-klubben ved Bjæverskov AV-klar med projekter og en storskærm koblet til webcam. Så der kunne både vises slides, men også live skitse-ning på papir, motordele og værktøj. Vi havde et godt fremmøde, klub-

ben var fyldt! Vi startede helt fra bunden med generel karakteristik af motoren og det blev hurtigt meget avanceret. Med simuleringer af kraften på plejlstangen og momentet genereret på krumtappen, videre over i hvor meget varme der bliver udviklet i de forskellige dele. Jeg havde aldrig kunne forestille mig at der er 90 Watt i friktion mellem plejlstang og krumtap, eller at stemplet udvider sig 0.065mm!

Det var meget spændende at se hvordan folk som ellers er meget snakke-saglige sidder og lytter, man kunne høre blyanterne på papiret mens folk tog noter – guldskorn! Under hele seminaret var der plads til at stille uddybende spørgsmål og små åbne diskussioner. I kaffepauserne blev der delt ud af røverhistorier. Vi brugte en del tid på emner om opsætningen af kuglelejer, hvad skal man holde øje med og hvordan man måler det. Ingen tvivl om at der skal laves noget nyt værktøj denne vinter og denne gang kan vi nok ikke 3D printe det, så er det godt at forfatteren har fået en ny drejebænk.

Søndag var skemalagt til at være kort dag, da Rob skulle nå flyet tilbage til Holland. Vi valgte at sætte skoen på den anden fod og fortalte Rob om det propel-projekt vi har puslet med i F2D gruppen det sidste stykke tid. Henning Forbech fremviste en metode at parametriske designe en propel i CAD, Bjarne Schou fulgte efter med en 3D-skanner specialbygget til at skanne propel geometri og André Bertelsen præsenterede en måle jig til at måle det statiske træk, momentet, den absorberede effekt og omdrejninger. Samt en anden opsætning til dynamisk at måle propel balance.

Rob kunne så fortælle os at vi er på samme spor som de hollandske og belgiske F3D-piloter, de har arbejdet med propel optimering og fremstilling i mange år, så de ved en masse. Det ville være spændende at tage kontakt til dem og høre hvor meget de ville være villige til at dele ud af deres viden, bestemt noget som skal undersøges.

Vi sluttede af med en kort opsummering hvor Rob spurgte om vi følte vi var blevet klogere eller blot forvirret på et højere plan. Hvor til vi kunne svare at vi har fået både be- og afkræftet nogle teorier samt hævet niveauet af de spørgsmål vi stiller og de ting vi skal undersøge i fremtiden.

/André Bertelsen DEN



Västerås Open

10 september 2023

En dryg vecka före tävlingsdatum hade det regnat riktigt mycket i Västmanland med åtföljande störtfloder från Sala ner mot Västerås via Svartån. Oron var stor att detta skulle hindra genomförandet av tävlingen. MEN, Ove Andersson hade gjort ett stort jobb med att fylla ut de djupa groparna på infartsvägen till linflygfältet. Det gick nu utmärkt att ta sig till fältet på den vanliga vägen. Med allt regn kom även myggen till Västerås, det var mycket mygg när första piloterna började anlända vid 9-tiden, men runt 10, när tävlingen började så kom solen och det började blåsa lite så då försvann myggen, så det blev en skön söndag med mycket flygande.

Besök

Vi fick besök under dagen av vår idrottskonsulent i Västmanland Anna Meissner, hon kom och ville se och hör vad vi håller på med i linflygciinklarna, så Ove, B-O och Kaj berättade om Västerås flygklubb modell och vad som händer här på Johannisberg, det är bra att marknadsföra oss så fler vet att vi finns till.



Kaffepetter

Av hävd flygs speed enligt Kaffepetter-regler på den här tävlingen. Det är en tävlingsform sedan 60-talet då det var vanligt att tävla i flera storleksklasser. Resultatet räknas i procent av det svenska rekordet för de olika motorstorlekarna. Det motsvarar på ett sätt handikappreglerna i golf. Den tävlande med högst procenttal blir vinnare. Vinnarens vandringspris var en kaffekittel vars öde numera är okänt.

Speed Open

Fyra tävlande var anmälda varav Ove Kjellberg och Sven Pontan ställde upp två klasser. Glädjande var Ove Kjellbergs resultat i 5 cc med 95,2 % av sitt eget svenska rekord. Övriga resultat var mediokra!!

Weatherman

Åtta tävlande var anmälda med motorer från 2,5 upp till 10 cc klassen. Alla gjorde resultat i tävlingen utom Bengt-Olof som kvaddade efter ett halvt varv. Vann gjorde Johan Rasmussen med nytt rekord på 106%. Grattis! Tvåa Lennart Nord 99,4%, Trea Per Stjärnesund 91,9%. Per flög inte Speed Open p g a knäskadan som inte är helt bra ännu.

Vid pennan B-O och Per.



Johan Rasmussen.



Klas-Göran Nilsson.



Bengt-Olof Samuelsson.



1 – Johan Rasmussen
– 106,0 %



2 – Lennart Nord
99,4 %



3 – Per Stjärnesund
91,9 %

RESULTAT Västerås Open Västerås FK modellflyg – 10 september 2023

WEATHERMAN VINTAGE SPEED

Placering, Namn, Klubb, Nation	Klass	Tid	Hastighet	%	Motor
1. Johan Rasmussen, Vallentuna MFK	6.6G	16,5	175,5	106,0	K&B 40
2. Lennart Nord, Västerås FK modell	2.5D	16,8	172,4	99,4	Zorro
3. Per Stjärnesund, Västerås FK modell	2.5G	18,5	156,5	91,9	Zorro
4. Klas-Göran Nilsson, Västerås FK modell	5.0G	18,6	155,7	89,2	Nova Rossi
5. Erik Huss, MFK Jordfräsarna	6,6 G	20,5	141,3	85,4	OS 40
6. Milenko Kvrđić, Karlskoga MFK	10G	25,2	114,9	74,2	OS 46
7. Sverker Evans, Nyköpings MK	2,5V	42,2	68,6	73,2	Viking
8. B-O Samuelsson, Västerås FK modell	2.5G	0			Nelson

Webra Record Cup

Placering, Namn, Klubb, Nation	Tid
1. Milenko Kvrđić, Karlskoga MFK	38,7
2. Sverker Evans, Nyköpings MK	40,1

SPEED OPEN

Placering, Namn, Klubb, Nation	Klass	Tid	Hastighet	%	Motor
1 Ove Kjellberg, Solna MSK	5 cc	14,9	241,6	95,2	OK
2 B-O Samuelsson, Västerås FK modell	F2A	14,8	243,2	81,2	Profi
3 Mart Sakalov, Västerås FK modell	F2A	23,6	152,5	50,9	Profi
4 Sven Pontan, Team Tornado	5 cc	0			OPS 29
5 Sven Pontan, Team Tornado	1,0 cc	0			Cox Tee Dee 049
6 Ove Kjellberg, Solna MSK	1,5 cc	0			OK



Johan Rasmussen.



Thomas Olsson.



Per Stjärnesund.

Oktober- utmaningen

14–15 oktober 2023

Höstens första mail-tävling lockade ganska många anmälda men när det väl kom till de dagar då det skulle flygas ställde vädergudarna till det på de platser där det skulle flygas. Bland annat kunde inget i Danmark flyga eftersom landet höll på att blåsa ut över Nordsjön. Så i sluttampen blev det en finsk debutant (Välkommen Jukka!!) som fick tävla mot de som samlats i Vänersborg och Västerås.

Klas i Västerås fick nu allt att stämma med sin NovaRossi bilmotor (5 cc) och klämde i med 107,1%! Snart lär han sig nog att Sergey Bubka, dvs bara slå rekordet med lite i taget. Eller så har han mer att ge! Problemet är att den tabell vi har för uträkning av hastighet slutar på 16,0 sekunder... Så nu blir det till att uppdatera den i vinter. På andra plats kom undertecknad som efter långt över ett års försök med olika propellrar etc lyckades nå rekordet för Drabanten. Vilket innebär att det bara är att jobba vidare för att flyga ännu fortare. Johan, Per, Stefan och Thomas var alla över 90% och det räcker till övre halvan av listan men inte mer.

I Webra var det åter Stefan som höll de andra bakom sig. Glädjande var att hela 5 stycken piloter kom till start här. ■

Ingemar Larsson



1 – Klas-Göran Nilsson
– 107,1 %



2 – Ingemar Larsson
– 100 %



3 – Johan Rasmussen
– 98,2 %



Sverker Evans.

RESULTAT Weatherman Vintage Speed OKTOBERUTMANINGEN – 14–15 oktober 2023

Placering, Namn, Klubb, Nation	Klass	Tid	Hastighet	%	Motor
1. Klas Nilsson, Västerås FK Modell SWE	5G	15,5	186,8	107,1	Nova Rossi
2. Ingemar Larsson, Vänersborgs MFK SWE	2.5DA	25,0	115,8	100,0	Drabant
3. Johan Rasmussen, Vallentuna MFK SWE	6.6G	16,8	172,4	98,2	K&B
4. Per Stjärnesund, Västerås FK Modell SWE	2.5G	17,5	165,5	97,1	Zorro
5. Stefan Olsson, Uddevalla RFK SWE	1.5G	20,8	139,2	93,3	Parra
6. Thomas Olsson, Trollhättans MFK SWE	1G	10,7	135,3	92,5	Profi
7. Jukka Vahvaselkä, Lassila LK FIN	2.5G	19,3	150,0	88,1	Fora
8. Sverker Evans, Nyköpings MK SWE	2.5DA	31,1	93,1	80,4	Drabant
9. Milenko Kvrđić, Karlskoga MFK SWE	2.5D	22,3	129,8	74,4	Fora
10. Toni Schmidinger, Västerås FK Modell SWE	2.5D	23,2	124,8	71,6	Super Tigre
11. Erik Huss, MFK Jordfräsarna SWE	2.5D	25,9	111,8	64,1	Hawk

Webra Rekord Cup

1. Stefan Olsson	31,5
2. Thomas Olsson	33,8
3. Milenko Kvrđić	37,8
4. Sverker Evans	38,0
5. Ingemar Larsson	38,2

November- kampen

25–26 november 2023

Årets sista tävling lockade tyvärr inte så många deltagare som vi hade hoppats på. Kanske var man rädd för att det skulle blåsa och regna och snöa. Eller så hittade man inte sina långkalsonger... Nu blev det åtta piloter från tre länder till start där halva fältet flög i snö och de övriga kunde se vilken

färg gräs har. I Vänersborg började dagen med blå himmel, solsken, vindstilla och minus tio grader. Egentligen ganska bra frånsett att man blev kall om händerna då man skulle starta motorerna. Som tur var kunde vi emellanåt värma oss framför kaminen i klubbhuset. Solen gjorde sitt till och när vi åkte hem framåt eftermiddagen var det bara två minusgrader.

Tittar man i listan ser man att nästan alla flög med dieslar och i toppen var det en total dominans av DA Drabant. Trots alla minusgrader på Brättnelund var det inga problem att starta våra dieslar men man fick både öppna nålen lite samt öka kompressionen något jämfört med de inställningar man har i varmare väder. Att det inte blev några rekord kan nog delvis skyllas på vädret och att man kanske bara ville flyga av sina tre försök. Kan bara se på oss själva på Brättnelund då ingen gjorde någon testflygning utan gick pang på tidtagning.

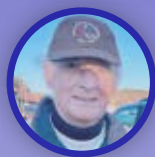
■
Ingemar Larsson



1 – Ingemar Larsson
– 93,3 %



2 – Harry Kolberg
92,3 %



3 – Mikal Hansen
83,1 %

RESULTAT Weatherman Vintage Speed November-kampen – 25–26 november 2023

Placering, Namn, Klubb, Nation	Klass	Tid	Hastighet	%	Motor
1. Ingemar Larsson Vänersborgs MFK SWE	2.5DA	26,8	108,0	93,3	Drabant
2. Harry Kolberg Skedsmo MFK NOR	2.5DA	27,1	106,9	92,3	Drabant
3. Mikal Hansen Agder MFK NOR	2.5DA	30,1	96,2	83,1	Drabant
4. Thomas Olsson Trollhättans MFK SWE	2.5D	20,3	142,6	81,8	Fora
5. Leo Voss NLC NED	1.5D	29,2	99,2	68,5	Tyr
6. Tom Andresen Agder MFK NOR	2.5G	25,2	114,9	67,5	ASP
7. Per Vassbotn Agder MFK NOR	1.5D	30,0	96,5	66,7	Fora
8. Stefan Olsson Uddevalla RFK SWE	1.5D	34,0	85,2	58,8	Webra



Leo Voss.



Ingemar Larsson.



En påpälsad Thomas Olsson.



Starthjälp.



Agdergänget – Tom Andresen, Per Vassbotn och Mikal Hansen.

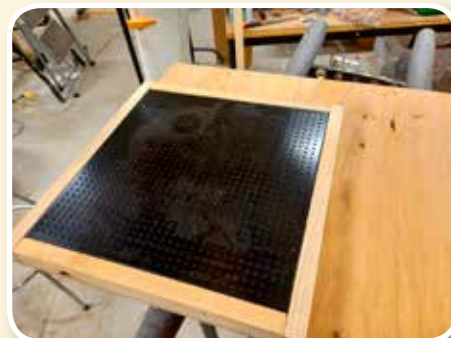


Stefan Olsson

Hemma hos Snobbarna



Hellséns Hangar har blivit lite av en samlingspunkt för modellflygare i Sölvesborgs närhet (och långhet)! Det började med att jag själv hade en mindre lokal för mina byggen och projekt men tyckte det blev ensamt i längden vilket gjorde att jag bjöd in likasinnade att dela lokalen. Snabbt blev lokalen för liten och vi flyttade till ett närliggande hus och disponerar nu ca 88 m² med 4,5 meters takhöjd. Efter 3 år här har vi olika åsikter då en del tycker den är för stor, en del för liten och några lagom.



Vi som stadigvarande huserar här är Torbjörn, Martin och jag själv (Anders) med några andra uppdykandes då och då. I lokalen finns allt från Flugan (AMA Cub) till 120 cc RC-modeller och totalt är det säkert 150 modeller här (i olika skick)! För min egen del är inriktningen mest åt linflyg i allmänhet och F2B i synnerhet. Mina sidoprojekt i Weatherman, Combat, Semispeed och Team Racing finns alltid på någon hylla om man behöver en paus från F2B. Antalet RC-modeller är tyvärr ganska högt och tar mycket plats i anspråk men de har låg prioritet.



Torbjörn och Martin är inte här lika ofta som mig då de bor en bit bort men de håller på med Weatherman- och Stunt-modeller mest och i en ände av lokalen finns deras projekt i form av ARF Nobler, en halvbyggd Twister, en Röde Rudolf, en Time Machine, 2 st Profile Oriental samt en massa oidentifierade objekt.



Att ha en gemensam lokal är bra ur många synvinklar, bland annat för att man kan dela verktyg och ha en komplett samling. I Hangaren finns numera bandsåg, pellarbör, svarv plus diverse handverktyg och flera stora byggbord. Så småningom kommer vi att få in en 3D-fräs (när vi hittar drivrutiner till styrkortet i datorn) samt en vertikalfrä. Efter jul kommer det nog en 3D-skrivare hit också.

Dessutom byggs det på 2 st Semispeed, en med pipa och en utan samt flera Weatherman-modeller (då det ligger flera lämpliga motorer på hyllan). Perra och Bella har också fått hjälp med varsin Vector ARF så att de kan fortsätta sina övningar i Semistunt.



För egen del håller jag på med några av de modeller jag planerar att använda nästa år, förutom service och underhåll av befintlig flotta. Från Norvald Olsvold i Norge har jag köpt en Rainbow med en Retro Discovery 68 och den modellen ska målas om. En Brodak ARC Strega har kommit från Alf Lindholm i Finland och i den sitter en Stalker 76, vilket kan vara i största laget då modellen är specad för 61-motor. Tanken är att modifiera modellen så att den blir isärtagbar.

Andra projekt på gång i lokalen är en SIG Mustang Stunter (med Fox 35), en Stiletto 660 med OS 46LA samt en Shark med en Saito 56 fyrtaktare. Plus en massa annat. Vi har också byggt en vacuumbord för att kunna tillverka egna kabinhuvar samt ett bord för lintillverkning. Att ha ett sådant bord gör att man slipper gå utomhus var gång man behöver nya linor.

För cirka 2 år sedan köpte jag några byggsatser från ett dödsbo i Göteborg, bland annat en "Green Box" Nobler som numera nästan är klar för lack. Tanken är att använda den i Classic Stunt ihop med en Fox 35 och en RevUp 10x6EW. Den ska målas i British Racing Green med gula fält!

Den finns nog mycket mer att prata om men detta får räcka för tillfället.

Anders Hellsén
MFK Snobben

Efterårs konkurrence i Borup



Søndag d. 13/11 blev årets sidste stævne kørt på banen i Borup. Dagen startede med vindstille og lidt overskyet vejr ca 8-10 grader. Så kom der regn da vi skulle flyve. Kun 3 fik en tid mens Jens kom 6 runde. Andre og Luis fløj ikke uden satte sig op som tidtagere og frøs.

Weatherman Vintage Speed

1. Ole Bjerager	2.5V	32,4 sek.	~ 95,4%
2. Bjørn Hansen	6.5G	18,3 sek.	~ 90,2%
3. Niels-Erik Hansen	2.5G	19 sek.	~ 89,5%
4. Jens Geschwendtner	2.5G	6,5 omg.	



Luis Petersen



Efter mange års fravær dukkede John Mau op med en af sine gamle modeller. Og han huskede, hvordan man gjorde det, da motoren startede og modellen fløj (med originale pilot Hans Geschwendtner).

Köbenhavnnermesterskab 2023

Man kan sige, at der ikke var mange flotte resultater denne dag i marken. Men vi havde en dejlig dag sammen.

Luis Petersen

F2A:

Hugh Simons	8 omg.
Ole Bjerager	5,5 omg.
Bjørn Hansen	0

F2C Veteran (1979 model- BG Mk.II motor):

Hans Geschwendtner/John Mau 22 omg. 19-20 s/10 v

F2C Team Racing:

Jens Geschwendtner/Hugh Simons 35 omg. 18-19 s/10 v

F2F:

John Mau/Hugh Simons	4:03,13	8:42,4
Jesper Buth/Ole Bertelsen	181 omg.	
(Husk at fylde tankflasken op næste gang!)		
Jens Geschwendtner/	22 omg.	16 omg.
Natasja Dementieva/		
Andre Bertelsen		

Weatherman Vintage Speed:

Niels-Erik Hansen	2.5G	17,8 s	~ 95,5%
Jens Geschwendtner	2.5G	17,8 s	~ 95,5%
Jørgen Aagaard	10G	22,0 s	~ 85%
Jesper Buth	1.5D	24,4 s	~ 81,9%

Dansk Mesterskab 2023

Årets Danmarks Mesterskab blev for første gang afviklet på den nyanlagte asfaltbane i Borup helgen den 26-27/8, undtagen for combat. Hvor der flyves over græs, for at undgå smadrede motorer, når der af og til sker sammenstød/styrt. Så er det "rart" med en blød græsbane.

Arrangementet var organiseret af Pingvinerne og Comet i fællesskab. Pingvinhuset med køkken, toilet og fællesrum er et solidt fundament. Afslutningsvis forgik præmieoverrækkelsen indendørs, da det blæste op efterfulgt af en kraftig regnbyge. Alt i alt en meget god debut for vores asfalt-cirkel og "udendørs" servering.

F2A Speed

Med 5 deltagere, var der for en gangs skyld lagt op til lidt spænding om mesterskabet. Hugh havde sine gamle modeller med fra Australien og var tæt på Niels. Ole viste også fremgang/stabilitet. Bjørn og Jens havde problemer med at få lyd-potten til at tænde/gå i resonans.

Minispeed

Med 2 tilmeldte og nogle behjertede forsøg med noget ustabile modeller/grej besluttede man sig for at stoppe forsøgene.

Weatherman Vintage Speed

Med 7 tilmeldte og 6 resultater var det en spændende klasse, hvor man frit kan vælge mellem de forskellige modelstørrelser og motorer. Herefter flyver man så op mod den bestående rekord i ens klasse. Spændingen udløses når konkurrenceresultaterne udregnes efter handicap tabellen. Intet er sikkert før den sidste mand har fløjet. Der er som regel ganske få tiendedele % til forskel.

Goodyear Racing

Denne klasse var tidligere en af de største på asfalten. Men er i tilbagegang efter at der er kommet en ny "begynderklasse" F2F hvor man kan købe færdigt grej og hvor det går hurtigere. GY hastigheden er begrænset til 24 sekunder/10 omgange ~ 150 km/t. Flyver man hurtigere kommer der en tids straf.

F2F

5 tilmeldte hold hvoraf 4 gennemførte. Finalen så ud til at blive spændene, med 3 hold i rimelig form. Da starten gik, kom 2 hold i luften med det samme, mens Calle arbejdede med at få en genstridig motor i gang. Det lykkedes først i linebåsen efter finalen. De 2 andre hold havde god fart på, men uheldigvis trådte Hugh op i Ole hæl under en overhaling og måtte cutte motoren, hvorefter den kørte ind i græsset.

Luis Petersen



Listen over resultater kan findes på side 59.



Preliminär tävlingskalender 2024

Datum	Tävling	Klasser	Plats	Arrangör	Kontaktperson
Fre 29/3	Häxvrålet	Weatherman, Classic Stunt	Inlag, Kungsbacka	KMFK	Michael Palm, 0730-77 48 63
Sön 28/4	Linflygets Dag	Speed Open, Weatherman, Semispeed	Johannisberg, Västerås	VFK	Per Stjärnesund, 0738-04 23 41
Tor-Lör 9-12/5	World Cup/NM	Alla klasser (nästan)	Åbytorp, Karlskoga	KMFK	Niklas Löfroth, 0702-09 69 65
Lör 1/6	Snobben Cup 1	F2B, Semistunt, Weatherman	Mygglanda, Nymölla	Snobben	Anders Hellsén, 0738-47 83 12
Lör 8/6	Oldtimerträff	Weatherman	Inlag, Kungsbacka	KMFK	Michael Palm, 0730-77 48 63
Lör 3/8	Snobben Cup 2	F2B, Semistunt, Weatherman	Mygglanda, Nymölla	Snobben	Anders Hellsén, 0738-47 83 12
Lör-Sön 24-25/8	SM	F2A, F2B, F2C, F2D	Johannisberg, Västerås	Grenstyrelsen	Ingemar Larsson, 0703-40 44 05
Lör 7/9	Västkusträffen	F2B, Weatherman	Inlag, Kungsbacka	KMFK	Michael Palm, 0730-77 48 63
Sön 15/9	Västerås Open	Speed Open, Weatherman, Semispeed	Johannisberg, Västerås	VFK	Per Stjärnesund, 0738-04 23 41
Lör 21/9	Snobben Cup 3	F2B, Semistunt, W	Västervik	Snobben	Anders Hellsén, 0738-47 83 1
Lör-Sön 28-29/9	Vbg-pokalen/RM	Slow Combat, Combat 1.5, W-man	Brättelund, Vänersborg	VMFK	Ingemar Larsson, 0703-40 44 05
Lör-Sön 5-6/10	Fly-a-Thon	Ringmaster	Mygglanda, Nymölla	Snobben	Anders Hellsén, 0738-47 83 12

Andra kända datum:

3-5/5	Världscup i Svitavy Tjeckien (CZE)	F2D
18-19/5	Världscup i Herning Danmark (DEN)	Alla klasser
22-23/6	Världscup, Jura Cup Schweiz (SUI)	F2A, F2C, F2F, F2G
27-30/6	Dubbelvärldscup i Wierzawice Polen (LTU+POL)	F2A + F2C
6-7/7	Världscup i Barcelona Spanien (ESP)	F2D
11-14/7	Dubbelvärldscup i Landres Frankrike (NED+FRA)	F2A, F2B, F2C, F2F, F2G
8-9/8	Världscup i Muncie (USA)	F2A, F2C, F2D
10-17/8	VM i Muncie, USA	F2A, F2B, F2C, F2D
7-8/9	Världscup i Lugo Italien (ITA)	F2A, F2B, F2C, F2F
5-6/10	Världscup i Valladolid (ESP)	F2A, F2B, F2C, F2D
15-17/11	Int V&V på Gran Canaria Spanien	Eurocombat, Stunt

Norska tävlingar/träffar (F2B och W)

Åpningstevne 27-28 april	Kristiansand
Sommerstevne 15 juni	Hvam
NM 27 augusti	Hvam

Finska tävlingar (F2B)

FM 1	15 juni	Nummela
FM 2	13 juli	Kuopio
FM 3	17 augusti	Nummela

LEJ 25 2.5 cc engine

Knowing my interest in Australian model engines, Tahn Stowe forwarded this obscure LEJ 25 2.5cc glow engine for review and performance testing. A collaboration between Barry Lee, Allan Edwards and Brian Jones. Initials on the crankcase. All notable members of the Southern Cross Model Aircraft Club. LEJ 25 first emerged from Barry's garage in Liverpool, New South Wales. Tahn has no further information.

Mat Oxley's terrific book "Stealing Speed" (ISBN 978 1 84425 975 5) tells how engineer Walter Kaaden revolutionised small two-stroke motorcycle engine technology and how that got to mainstream Japanese motorcycle builders. A further step when American F2A Speed flyers dramatically introduced that to model aircraft engines. Essentially making existing stuff "old hat" for competition work. And fostering "specials" seeking a competitive edge. The LEJ 25 was most likely made in the late 1960s to beat the dominant Super Tigre G-15 in F1C free flight work. Perhaps the new FAI Combat class also. Many Aussies simply made smaller versions of then-current, fast glow-powered "open combat" models – powered by G-15s for F2D – rather than follow the British diesel formula.

Missing prop driver, NVA, venturi insert and head gasket, it otherwise looks OK. Handsome crankcase and back plate castings, probably shell moulded, with carefully cored intake aperture. The offset venturi idea copied from Super Tigre's G-15 and aiming for rapid opening/closing of the rectangular rotary intake port with matching inlet for optimal flow. The upper crankcase, more easily machined from aluminium bar stock. The two-piece design simplifies forming of three bypass passages – by hand in this instance. Rear-facing exhaust for neater cowling in an F1C model.

Some of the problems were seen at the Australian game with Super Tigre spinners.



Limited availability of suitable ball races perhaps dictated the slender 9mm crankshaft main journal diameter. Gas passage drilled 17/64 inch (6.7mm). Front journal threaded M5, probably to accommodate a Super Tigre spinner assembly. Nicely counterbalanced crank web, hollow crank pin, sensibly timed rectangular valve port. Shaft is unhardened, surface finish adequate, fits well into crankcase, spins freely. OK so far.



The hand-shaped aluminium conrod connects to the no-frills cast iron piston. The steel cylinder has two adjacent ovoid exhaust ports, leaving a retaining bridge for the floating wrist pin. Three pairs of drilled holes, steeply inclined upward for mixture transfer. Which of course would not provide the hoped-for superior Schnuerle loop scavenging advantage any more than a Mk 2 ED Bee. And drill deflection against the curved outer cylinder had caused them to go awry. One so far off, that there is no material at the bore surface separating its edge from that of the adjacent exhaust port. Four long screws retain the upper cylinder and head, with its almost flat bowl combustion chamber. Regular 15/14mm bore to stroke numbers.



One cylinder retaining screw thread is stripped. Now here's a hack worth remembering. If the remaining thread is not too wrecked, form a strip of thin brass shim stock (width 1/4 – 1/3 inner hole circumference) around a drill bit/nail/wire to sit neatly against the inner wall. Insert in hole, followed by the screw (its end ground to a slight lead-in taper). The shim pushes the screw into the opposite remaining thread. Held well enough this time for adequate head to cylinder flange seal. Piston fit evidently aimed at eliminating friction and taking full advantage of castor oil's superior viscous seal potential (read slack).

With 3:1 methanol/castor fuel, the LEJ 25 would run out a wet prime OK but attempts at sustained running in bladder feed failed. Mainly due to the short unrestricted rectangular intake. Its 50 sq mm choke area about double what this engine could possibly need. Fuel delivery utterly haphazard. The engine would speed up from very rich and die lean, despite great care with needle setting.



Persevering, our impromptu venturi insert from dense rubber foam, leaving a modest aperture got it running on suction feed. Still could not be adjusted even close to clean 2-cycle running. While much fuel escaped via the front ball race. RPM checks on several propellers too embarrassing to record here. An object lesson in the importance of accurately formed 2-stroke engine ports. Jaures "Mr Super Tigre" Garofali's sleep would not have been disturbed by LEJ 25's initial test runs. The undrilled mounting lugs suggest it never took to the air, likely remaining a heroic one-off failure. Now an interesting conversation piece.

Maris Dislers
AUS



Results

Karlskoga World Cup and Open Nordic Champs

9th - 12th of May 2024

Mark this in your calendar!

Pre-registered pilots and more info at www.f2d.n.nu

Dansk Mesterskab 26-27 August 2023

Plac, Navn	Klub	Klass	Tid	Hastighed	%
1	Jens Geschwendtner	Comet 3,5G	18,5	156,5	97,2
2	Ole Bjerager	Comet 2,5V	32,3	89,6	95,6
3	Niels Lyhne-Hansen	Herning 2,5G	17,8	162,6	95,5
4	Niels-Erik Hansen	Comet 2,5G	17,9	161,7	94,9
5	Jørgen Aagaard	Pingvin 1,5D	25,2	114,9	79,3
6	Jesper B Rasmussen	Pingvin 2,5D	23,1	125,3	72,2

Dansk Mesterskab Lag-DM

Plac, Klub	Point
1	Comet 32
2	Herning 22
3	Pingvinen 18
4	Aviator 2

Dansk Mesterskab 26-27 August 2023 F2F

Plac, Navn	Klub	1	2	Finale	
1	Jesper B Rasmussen/Ole Bjerager	Pingvin/Comet	04:24,7	04:14,0	08:48,3
2	Hugh Simons/John Mau	Comet	70 omg.	04:12,0	129 omg.
3	Calle Fanøe/Henning Forbech	Herning	04:45,6	46 omg	Ret.
4	André Bertelsen/Jens Geschwendtner	Pingvin/Comet	09:20,9	9:20,90	

Goodyear Racing

Plac, Navn	Klub	1.	Finale	
1	Jesper B. Rasmussen/Ole Bjerager	Pingvin/Comet	4:40,40	09:27,5
2	Calle Fanøe/Henning Forbech	Herning	5:30,00	12:42,0

Dansk Mesterskab 26-27 August 2023 F2A

Plac, Navn	Klub	1	2	3
1	Niels Lyhne-Hansen	Herning	191,5	278,9
2	Hugh Simons	Comet	-	269,1
3	Ole Bjerager	Comet	232,3	264,7
4	Bjørn Hansen	Comet	133,6	141,7
5	Jens Geschwendtner	Comet	-	-

F2A Warszaw World Cup Wloclawek Poland 2023

Place, Name	Nation	Best
1	PERRRET, Matthieu	FRA 295,5
2	EISNER, Paul	GBR 295,2
3	HALMAN, Peter	GBR 293,6
4	MIS, Artur	POL 293,6
5	ROSTISLAVOV, Anthony	FRA 293,4
6	SOBALA, Tomasz	POL 291,6
7	WALANIA, Kacper, J	POL 291,1
8	AUBE, Jean Marc	FRA 290,3
9	POPOV, Oleg	UKR 286,1
10	KUPRAS, Kamil, J	POL 270,4
11	BREWIN, David	GBR 249,3
12	SATEK, Simon, J	SVK 240,6
13	SATEK, Samuel, J	SVK 211,2
14	SATEKOVA, Gabriela	SVK 0
14	DIVKO, Matej Filip, J	SVK 0

F2D Warszaw WC W-vek Poland 2023

Place, Name	Nation
1	Rediuk, Illia
2	Kuckailis, Gintaras
3	Tukubaev, Igor
4	Donchev, Romeo
	Butnari, Igor
	Rastenis, Audrius
7	Dushenko, Dmitry
	Dementiev, Igor
	Dementiev, Alexandr, J
	Vardanyan, Sergey, J
	Milenin, Danylo, J
	Riera, Xavier
	Chorny, Ivan, J
14	Lylyk, Lyubomyr
	Khachatryan, Sergey
	Bunker, Alan
	Champain, Benoit
	Rastenis, Sofija, J, W
19	Tkach, Ihor, J
	Crabtree, Jonathan
	Buyanov, Vladimir
	Platkauskas, Robertas
	Mariash, Sergey
	Spatenka, Radek
25	Lutsyk, Andrii
	Vardanyan, Armen
	Vardanyan, Ruben, J
	Price, Gordon
	Unruh, Rafael
	Pinkerton, James
	Cantatore, Antonello
	Königshofer, Rudolf
	Kral, Milan
	Toman, Dalibor

F2C Euro Champs Wloclawek Poland 2023

Place, Name	Nation	Best Q	Best S	Final
1	MAKARENKO/OSADCHYI	UKR 3.12,0	3.11,0	6.25,5
2	BARRAGAN/BARRAGAN	ESP 3.16,5	3.12,2	6.44,0
3	IGOSHYN/CHAYKA	UKR 3.16,7	3.13,4	6.48,5
4	FEDAN/LESIIUK	POL 3.14,1	3.17,6	
5	ORVOS/METKEMEIJER	NED 3.18,1	3.18,0	
6	BONDARENKO/LERNER	UKR 3.12,2	3.18,1	
7	SURUGUE/SURUGUE	FRA 3.09,9	3.18,4	
8	GAUTHIER/VILLEBOEUF	FRA 3.20,0	3.20,3	
9	OUGEN/SURUGUE	FRA 3.17,4	3.22,1	
10	PANCHENKO/J/CHAICA,J	UKR 3.19,7	3.30,9	
11	WATERS/BROADHEAD	GBR 3.17,2	3.40,0	
12	GROSSI/ROSSI	ITA 3.20,1		
13	PIOTROWSKI/DZIKOWSKI	POL 3.21,7		
14	IRGILI/COCCHI	ITA 3.22,7		
15	DE RIDDER/KRUIJFF	NED 3.26,3		
16	ORLOVAS/CIBULSKAS	LTU 3.28,2		
17	TOMCZYK/BECCZALA	POL 3.32,4		
18	GLUSZEK, J/ROZBIEWSKI, J	POL 3.34,8		
19	BARKER/TRICKER	GBR 3.50,9		
20	MOLYNEUX/THORPE	GBR 3.53,3		
21	ZUKAUSKAS/SABLINSKAS	LTU 3.57,6		
22	ILIEV, J/IVANOVA, J, W	BUL 4.02,7		
23	STOLL, F/LESIIUK,F	POL 42 r		
24	OTERINO PALMERO/CRESPI	ESP Dq		

F2B Euro Champs Wloclawek Poland 2023

Place, Name	Nation	Qual	Final
1	TURCHENKO	UKR 2294,72	1142,00
2	BORZECKI	POL 2229,49	1136,58
3	KRAVCIC	CZE 2271,66	1132,81
4	SOLOMIANIKOV	UKR 2244,06	1130,50
5	VALLIERA	ITA 2242,96	1128,35
6	WADLE	GER 2185,80	1117,70
7	DOLOBAC, J	SVK 2200,23	1112,26
8	KOKULA, J	SVK 2137,19	1110,28
9	KUBIK	POL 2170,03	1110,02
10	GASPAR, J	SVK 2136,53	1107,38
11	JANIK	POL 2188,86	1106,24
12	CHAPOULAUD	FRA 2163,46	1105,32
13	RADOS	CZE 2165,16	1101,44
14	MAGGI	ITA 2143,39	1095,76
15	SOUZA	POR 2122,96	1094,40
16	FELICI	ITA 2121,36	
17	ULIANENKO, J	UKR 2104,49	
18	GAUTHIER	FRA 2095,56	
19	KAPUSCINSKY	CZE 2095,32	
20	DOLOBAC, J	SVK 2074,09	
21	SOPELNIK	UKR 2068,96	
22	ROBINSON	GBR 2068,46	
23	PIGOUT	FRA 2055,50	
24	VASILIAUSKAS	LTU 2046,02	
25	PILKIONIS	LTU 2044,96	
26	MORBITZER	GER 2042,49	
27	MORGAN	GBR 2026,36	
28	TOKAI	HUN 2014,10	
29	JONES	GBR 2010,33	
30	SILVA, W	POR 1989,03	
31	VELLAI	HUN 1976,36	
32	SEDLATCHEK	SUI 1971,96	
33	OTERINO	ESP 1952,53	
34	VASKYS	LTU 1947,53	
35	FIUSSELLO, W	ITA 1939,86	
36	BAUMANN	SUI 1902,36	
37	WIBMER	GER 1865,82	
38	RAKOWSKA, J, W.	POL 1838,26	
39	RUSSBACH	SUI 1715,59	
40	TRAVNIK	HUN 0,00	

F2D Euro Champs Wloclawek Poland 2023

Place, Name	Nation
1	MATEO, Raul
2	DEMENTIEVA, Natalia, W
3	FORSS, Jussi
4	LOPEZ, Jose Luis
	HORST, André
6	SEGARRA, Xavier, J
	FORSS, Timo
	UNRUH, Rafael
	PRICE, Gordon
10	KHACHATRYAN, Sergey
	WISEMAN, David
	KONIGSHOFER, Rudolf
	KUCERA, Pavel
	REDIUK, Illia
	CHORNY, Stanislav
16	RASTENIS, Audrius
	RIMSA, Vytautas
	TOMAN, Dalibor
	FRIES NIELSEN, Morten
	RIERA, Xavier
	VOSS, Leo
	BUYANOV, Vladimir
	DONCHEV, Romeo
24	VARDANYAN, Sergey, J
	PLATKAUSKAS, Robertas
	RASTENIS, Sofija, J, W
	BERTELSEN, André
	SCHOU, Bjarne
	CHAMPAIN, Benoît
	CHORNY, Ivan, J
	DONCHEV, Lyubomir
32	VARDANYAN, Armen
	CRABTREE, Johnathan
	VASILEV, Mihal, J
	RIMSA, Simonas, J
	KRAL, Milan
	MUNCK, Liv, J, W
	MATEO, Manuel
	VALKONEN, Kimmo
	UMRYHIN, Andriy
	KLIUCHYSHCHIEV, Yana, J, W
	DEMENTIEV, Igor
	DEMENTIEV, Alexandr, J
	TKACH, Ihor, J
	IVANOVA, Yoana, J, W

F2A Euro Champs Wloclawek Poland 2023

Place, Name	Nation	Best
1	GROSSI, Luca	ITA 306,9
2	ELEKES, Imre	HUN 306,3
3	SZVACSEK, Ferenc	HUN 301,5
4	EISNER, Paul	GBR 301,0
5	HALMAN, Peter	GBR 300,6
6	MIS, Artur	POL 298,0
7	BIELYKOV, Valerii	UKR 297,5
8	ROSTISLAVOV, Anthony	FRA 297,4
9	WALANIA, Kacper, J	POL 295,4
10	CSOMA, Gyorgy	HUN 295,1
11	BREWIN, David	GBR 294,8
12	PERRRET, Matthieu	FRA 294,2
13	POPOV, Oleg	UKR 292,6
14	POBYIPECH, Oleg	UKR 292,3
15	SOBALA, Tomasz	POL 290,9
16	AUBE, Jean Marc	FRA 290,3
17	ESSELAAR, Han	NED 289,3
18	POBYIPECH, Makar	UKR 281,9
19	HOLECZEK, Robert	POL 279,5
20	GONZALEZ, Miguel	ESP 275,3
21	BJERAGER, Ole	DEN 268,9
22	SATEK, Simon, J	SVK 227,8
23	SATEK, Samuel, J	SVK 214,8
24	DIVKO, Matej Filip, J	SVK 176,5
25	POPOV, Ivaylo	AUT 164,7
26	SATEKOVA, Gabriela	SVK 137,5
27	LYHNE-HANSEN, Niels	DEN 0

F2B Warszaw World Cup Wloclawek Poland 2023

Place, Name	Nation	2 Best
1	TURCHENKO Mykola	UKR 2272,02
2	SOLOMIANIKOV Sergii	UKR 2205,96
3	DOLOBAC Patrik, J	SVK 2188,10
4	WADLE Frank	GER 2178,79
5	NIESCIORUK Marek	POL 2149,66
6	KUBIK Sylwester	POL 2145,09
7	GASPAR Jakob, J	SVK 2140,26
8	DOLOBAC Vincent, J	SVK 2039,89
9	KOKULA Kristian, J	SVK 2109,86
10	TARAN Adam	POL 2139,69
11	VASILIAUSKAS Algimantas	LTU 2036,49
12	PILKIONIS Vitalijus	LTU 2073,73
13	SOPELNIK Andrii	UKR 2075,62
14	PIGOUT Jacky	FRA 2121,76
15	SOUZA Rafael	POR 2072,76
16	KAPUSCINSKY Peter	CZE 2117,93
17	GAUTHIER Philippe	FRA 2115,22
18	CHAPOULAUD Nicolas	FRA 2137,20
19	DZIUBA Pawel	POL 2113,12
20	OTERINO PALMERO Jose Luis	ESP 2021,86
21	MORBITZER Dietmar	GER 2013,96
22	VASKYS Vidmantas	LTU 1999,86
23	KRAVCENKO Pavlo	POL 1959,63
24	GAUTHIER Baptiste	FRA 1959,33
25	SILVA Rafaela, W	POR 1940,16
26	DOLOWY Zbigniew	POL 1926,60
27	ULIANENKO Denis, J	UKR 1894,89
28	MELNIKAU Mikhail, J	POL 328,33

F2C Warszaw World Cup Wloclawek Poland 2023

Place, Name	Nation	Best Q	Best S	Final
1	MAKARENKO/MARCHUK	UKR 3.13,8	3.16,5	6.37,5
2	GAUTHIER/VILLEBOEUF	FRA 3.26,1	3.18,7	8.02,4
3	MAKARENKO/OSADCHYI	UKR 3.12,5	3.18,5	Dq
4	ZUKAUSKAS/SABLINSKAS	LTU 3.28,5	3.20,3	
5	WATERS/BROADHEAD	GBR 3.24,9	3.22,3	
6	ORLOVAS/CIBULSKAS	LTU 3.24,2	3.25,3	
7	ORVOS/LESIIUK	NED/POL 3.23,7	3.26,5	
8	OUGEN/SURUGUE	FRA 3.22,7	3.31,5	
9	BARRAGAN/BARRAGAN	ESP 3.18,1	3.40,0	
10	BARKER/TRICKER	GBR 3.38,9	67 laps	
11	OTERINO PALMERO/CRESPI	ESP 3.26,8	57 laps	
12	MOLYNEUX/THORPE	GBR 3.31,2		
13	GOLISZ/SZATECKI	POL 3.38,3		
14	GLUSZEK/ROZBIEWSKI	POL 3.38,4		
15	ILIEV/IVANOVA, W	BUL 4.10,0		
16	DE RIDDER/KRUIJFF			

3F Hobby Service

Efter 40 år är 3F Hobby Service TILL SALU

20-50% REA
på innevarande lager

SLUTSPURT

Mejzlik Propellrar -30%

APC propellrar alla sorter -25%

MVVS delar -50%

Menz Träproppar -25%

Krümscheid dämpare delar spinners -25%

Brodak wire, modeller och tillbehör -20%

Bisson dämpare 50 kr/st

Trämateriäl, balsa mm -20%

Lipobatterier -25%

KLOTZ oljor -20%

Aero-Naut spinners + propellrar



Titebond Original
Trälím 237ml:
Endast 60 kr



Needle Valve Assembly
Brodak .25 & .40, ø 4 mm
Extended length needle also available

3F HOBBY SERVICE

www.3fhobbyservice.jetshop.se

Mail: trefhobbyservice@allt2.se

Phone: +46 (0)70-62 61 370

Address: Gyllenhjelmsväg 3, 611 36 Nyköping