

LINA

Nr 2-22



*God Jul och
Gott Nytt År!*

**World Champs
Wloclawek**

SPEED • STUNT • TEAM RACING • COMBAT



I detta nummer: F2D-historia • VM i Polen • Fantkas • F2G-tips
• LA Money Nats • Hur man blir en världsmästare • SM • NM •
Västkusträffen • Weatherman • PAW • Paint Book • Vbg-pokalen
• KR Story • Jakten efter den tid som flytt • och mycket mer ...



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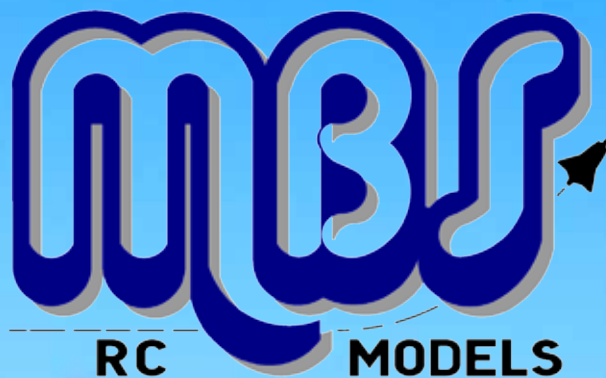


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Ett år går så fort ...

och kanske är det så att Einstein hade rätt? Dvs att tiden går fortare ju äldre man blir... Känner Ni också så? Lyckligtvis har ju året och dess tävlingar i stort sett återvänt till hur det var innan covid-pandemin. För egen del har det, förutom svenska tävlingar, bjudit på resor till Danmark, Spanien, Polen och Italien. Alla med trevliga minnen hem i bagaget. Ett av de trevligaste minnena är från Polen och när Jussi Forss från Finland blev världsmästare i Combat. Jussi har under många år placerat sig i toppen av alla resultatlistor och äntligen fick han mycket välförtjänt vinna VM. Stort grattis!!

Under året har mail-tävlingarna i Weatherman fortsatt trots att vi haft vanliga tävlingar och det är nog så att mail-tävlingarna kommer att fortleva då de får många piloter att delta i ett gemensamt arrangemang. Något som kanske aldrig skulle skett om man varit tvungen till många timmars bilresa för att komma till en tävling och göra tre W-flygningar.

/Ingemar Larsson

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On the cover: F2D Combat at the World Champs in Poland and a heat between Natasha Dementieva (DEN) and Manuel Mateo (ESP). This is in round 6 and the heat was won by Manuel with 3-2 in cuts plus 30 seconds better air time. The loss for Natasha kicked her out of the contest while Manuel had to wait until round 7 before he was a tourist. Photo taken by Massimo Semoli.



A view of the contest site with the two farmac circles.

FAI World Championships 2022

This year's World Champs were held in Poland and for the second time, the competitions were arranged in the city of Wloclawek, located about 170 km northwest of Warsaw. The venue consisted of large open fields, excellent facilities, a restaurant on site, and good parking facilities. Unfortunately, the organizer did not have access to the facility until shortly before the competition, which for us stunt pilots meant that the circles were initially next to useless. Just in time for the start, however, the organizer had managed to get the two circles intended for F2B in acceptable condition. The World Champs had a cool new feature as the scores were presented on big TV screens in real time. You could thus see your score and current standings immediately after landing. This added greatly to the positive experience and gave a very professional flair to the World Champs!

Traveling from Sweden to Wloclawek

Ingemar Larsson and I had chosen to travel together, which made the trip down through Sweden extra enjoyable. Just before reaching Karlskrona, we made a nice stop at Erik and Mia Björnwall's home where we were offered coffee and sandwiches. We also took the opportunity to look at Erik's beautiful model railway. In the evening we boarded the ferry where we met up with part of the other Swedish team members; Bengt-Olof Samuelsson, Per Stjärnesund, Michael, and Emil Palm. We all had a tasty dinner together before heading to our cabins. After a good night's sleep, we rolled off the ferry in Gdynia and from there it was a few hour's drive on a highway all the way to Wloclawek.

Father and son Palm and myself had chosen a hotel within walking distance from the competition venue. They had cheap but good food and chilled drinks to offer, which was

convenient after a long day at the field. The German Stunt Team consisting of Frank Wadle, Christoph Holtermann, and Dietmar Morbitzer with his wife Nicole also stayed at our hotel. We had very nice company with the German group and had dinner together almost every night.

Warsaw World Cup

In recent years it has become customary for a World Cup competition to be held in connection with the championship and so was it this time as well. The entire Swedish stunt team had managed to register despite the fact that the number of participants was limited to 30 pilots. For me, it was a fantastically cool first experience to fly and compete against some of the world's best stunt pilots, including two former world champions!

The weather conditions were quite challenging with strong winds at times. I was grateful to have a piped combustion engine in my model which helped to keep the lines taut. The World Cup contest was won by Orestes Hernandez ahead of Igor Burger in second and Zbynek Kravcik in third. One pilot who stood out a little extra was Kravcik, who flew a biplane of his own design named Red Wings. He proved beyond all doubt that it is possible to fly a biplane at the very highest level (at least with Kravcik at the handle ;-)).

The World Champs start

On Monday, the official practice flights were held. After we (the Swedish F2B team) had made our flights we walked over to the processing hangar and the procedures went very smooth and quick. Later in the afternoon, there was an opening ceremony with a dance performance, air shows, etc.

Nowadays in an F2B World Champs the contestants do four qualification flights, two in

each one of the two circles, with three judges in each. The best score from each circle is summarized and the 15 pilots with the highest score advance to the fly-off with three flights in front of all six judges.

Qualification rounds

The first round started on Tuesday morning. Michael and I flew in the morning while Emil (junior) and Anders Hellsén flew in the afternoon. Michael was the third man to fly in circle B and made a decent flight. A while later it was my turn in Circle A. Just before the start I discovered that the glow plug on the engine was dead. Quickly off with the engine cowling and replace the plug. Being able to keep calm when such things happen is a challenge! I was really nervous before my first flight. The nervousness probably sharpened the concentration an extra notch because it was perhaps my best flight so far and it gave a decent 995 points. Anders also did an okay flight, especially considering that he was flying his dad's 40-year-old Genesis and got just over 958 points.

On the second day, it was the other way around. Emil was the first out of us Swedes. Unfortunately, the engine was set on the lean side, resulting in the flight exceeding seven minutes. Michael was first out in the afternoon and suffered a mishap almost immediately when the fuselage broke with a distinct crack while doing the transition to inverted in the wingover. Fortunately, the model held together and was repaired after landing. The following qualification rounds had some more minor issues but noting we couldn't cope with.

Fly off

The first round of the finals was flown in a rather challenging wind. Probably due to thermals, the wind was quite capricious. It



Julia Lesiuk POL have just restarted her F2C Model.

Wloclawek Poland



Teams from Denmark and the Czech Republic.



Team Gold for USA in F2A. Patrick Hempel, Junior World Champion Ivan Valishev, World Champion Alexander Valishev and Bill Hughes.



Team Finland looked like they were on their way to the Templar Knights Convention!



Bjarne Schou DEN release a model watched by Judge Pavol Barbaric.



Team Sweden



The model of Howard Rush USA.

could suddenly make a 90 degrees change of direction, which, among others, Konstantine Bajakine CAN had to struggle through. More than half of the contenders made their least scoring flight in this round of the finals. Burger SVK was in the lead after the first round followed by Kravcik CZE and Solomianikov UKR. Hernandez USA flew his Shark impressively through the troublesome wind and was just behind in fourth. The pilot who impressed everyone already four years ago was the Chinese junior Xu Le Ton and he was even better now. Xu was in fifth place, which later also became his final placing.

The second and third rounds of the finals were flown the following day. The weather was perfect now and held steady all day. Fair conditions in other words. It was an incredibly close competition where only fractions separated the top four pilots. Igor Burger SVK won by only 0.25 points ahead of Zbynek Kravcik CZE even though Kravcik's score in the third round was the highest of all rounds. Orestes Hernandez USA was able to pass Solomianikov UKR in the second round and at the end managed to maintain third place with a margin of only 0.71 points. The happiest participant was probably Frank Wadle GER who made it to the World Champs final for the first time. Frank ended up in 9th place. His team member Christoph Holtermann also made it to the finals and took care of 12th place.

If you look in the results list, you will notice many prominent pilots were missing from this WC. The top nation China stayed at home with the exception of junior Xu Le Ton who had financed his participation without help from the Chinese state. From Ukraine, only one pilot participated – Solomianikov. Also Japan, who won the team gold in Landres 2018, was absent. The uncertainty surrounding the pandemic and the proximity to the war in Ukraine was stated to be the reason. One participating country we had not seen before was Mongolia. They had sent a full team of young pilots also including a girl! They participated with great enthusiasm and looked to have a bright future ahead of them.

Below the top half

It was, as expected, a rather modest result among us Swedes. For the moment we simply don't fly and practice enough to assert ourselves internationally. Personally, I can say that my own result was as good as it could possibly be given my experience and level of practice. My gear worked amazingly well; The model was well-tuned, the engine ran next to perfect, and started on the first flick through the whole contest. The biggest limitation was simply my lack of an adequate amount of practice (and talent perhaps...:-)). For me personally it still was a great and fun experience attending a World Championships. Hopefully there will be more to come in the future.

Trending technology

The trends in F2B showed that the electric motor is becoming increasingly popular among stunt pilots around the world. Of the 15 pilots who made it to the F2B finals at this WC, only one used a combustion engine (Frank Wadle – Discovery Retro 68). Another clear trend is that fewer and fewer compete with a model they have built themselves. Less than half was the builder of their model at this WC probably resulting in a more even competition as the pilot's building skills will no longer be decisive in the same way as before. In the final, various RTF-models by Yatsenko were the most common, which is perhaps not so surprising since their models were among the first on the market. Examples of other RTF-models used were Igor Burger's Max Bee, Leonidov's LA-4, Solomianikov's Maestro, and the Starlight of Vasily Astrakharchik. The Polish team led by Krzyzian Borzecki did a fantastic WC with three pilots in the final proving that the technology with the counter-rotating propellers is a successful concept.

In conclusion, a very nice Championship which will hopefully return to the host country Poland in the near future - I think that many people, including me, would like to come back to Wloclawek again.

/Niklas Löfroth



*Model of Ukrainian pilot
Sergeii Solomianikov.*



Traian Dorin Morosanu ROU



*Nandintsetseg Nomin
MGL*

*German F2B Team of
Christoph Holtermann,
Dietmar Morbitzer and
Frank Wadle.*



This year the Champs started on August 8 with processing of the models. The days before there had been two days of World Cup where all the Swedish competitors lined up to get a feeling for the competition venue and also to get a few extra flights.

The Swedish Team stayed in three different hotels. Per Stjärnesund and I (B-O Samuelsson) had chosen to stay at the Garage Hotel, which was very special. It was a so-called "design hotel" where the inspiration had come from cars and motor racing. The restaurant was made up of different car parts, for example the bar counter was the flatbed of a Polish pickup truck and if you got a soup pot you just had to fill up from the Texaco pump, if you wanted to have breakfast from the back of a Lada it was fine, the tailgate was furnished with a sofa and the wheel lights in the ceiling lit up nicely, so yes, you discovered new things every day. In our bedroom the walls were covered with different car body parts! Not two rooms were the same.

The competition venue was the same as in 2014, so it was familiar to us with perfect circles in F2A and F2C but the same bad conditions for F2B as in 2014. Unfortunately, there is too little staff and interest on the part of the organizer to prepare the stunt circles! In the former eastern countries people like pomp and circumstance at inaugurations, so here too. The organizer received good help from the local military authorities with volunteer personnel from what can be considered the equivalent of "young FBU" in Sweden. These young people were present from the inauguration to the farewell ceremony. In between they were officials for all competition classes and did an admirable job!

This World Champs was a little odd in terms of the participation. Russia and Belarus are banned from all participation by the FAI. A number of countries refrained from participation both for Covid reasons and Russia's war in Ukraine. For example, there were only 30 competitors in F2A when we usually have about 50. Race leader for F2A was Lajos Kantor who has done so in a number

of championships. He was occasionally very picky about how things should be handled, but it all turned out well in the end. We had brought Göran Olsson's display to Transi-Race, but unfortunately it was never set up and connected. It took some of the suspense away as you only heard the final result of the flight, but you could see the results list live on a bigger screen.

It is noticeable how the results have improved since the last Champ in 2018. Five results over 300 km/h! The good result of Per, 297.3 km/h, was only enough for 10th place. For my part, the results were hindered, among other things, by the fact that my placement of the handle in the pylon was rejected on several occasions. Besides, I wouldn't have been able to fly at 300 km/h!! The American speed National Team took home all the gold medals, victory individually by Alexander Valishev with a new world record of 308.8 km/h. Son Ivan Valishev was second at 306.5 km/h in the senior class and won in the junior class and finally they won the Team Gold. Former World Champion Luca Grossi from Italy came 3rd at 305.0 km/h.

In F2C the traces of the pandemic meant that a number of national teams were absent, including USA, Australia and England. In all, there were only 23 competing teams, including 5 junior teams and 2 female teams.

Rob Fitzgerald, who had been needed to provide firmness in the judging, was missing from the judging trio. I could note that there were no disqualifications and warnings for harsh pilot behavior. I myself would have dq'ed some team for brutal whipping ie "swing line" in at least two heats. In today's very tight heats, it becomes easy for the pilots to take in too much!

Despite the limited number of participants, the results are very good. In the final, Volodomyr Makarenko/Ihor Osadchyi won with a new world record time of 6.30, 8. Also pleasing was the Singapore team in third place!

/Bengt-Olof Samuelsson.



Why not eat your breakfast in the back seat?



The Bar counter was a cut apart truck.



Bill Maywald USA was the only one competing with tail boom construction.



Jussi Forss FIN and Kent Thorup DEN.

Jari Valo FIN prepare for a flight in F2A. Meri Niiranen and Timo Forss assists.



Hugh Simons DEN

Oleksi Igoshyn UKR

Pascal Surugue FRA



Zbyněk Kravčík CZE talking with Lauri Malila SUI.



Patrik Dolobac SVK



Vladimir Shatkov used this inflatable globe as a symbol for his F2D contest in eastern Ukraine, a contest where Vernon Hunt and Ingemar Larsson judged for several years. Now Vladimir brought it to Poland!



Zbyněk Kravčík CZE



Ronen Eizenberg ISR



Luca Grossi ITA



It was a few years since we were in Wloclawek flying and if covid hadn't stopped things, this year's Champs would have already been held in 2020. But now it happened, maybe with slightly fewer participants than we've been used to in recent years, but those of us who came had a nice time and you have to give credit to the Polish organizer for their arrangements. Despite some rain showers, the weather was very nice throughout the competition and the food was consistently very good. Compared to last time, two improvements had been made. First the airfield was closed for all other activities with our Champ in progress and secondly F2D Combat had been moved to a place closer to the tarmac circles and the main building (which made communications easier!).

It was also the first time that a country was allowed to enter a female participant in each class, but unfortunately there were so few women in all four classes that no female World Champion could be crowned. The FAI rules say that the classification for both juniors and women must have participants from 4 different countries in order for a champion to be named. Both F2B and F2D had 3 female participants so it was close. This also affected the juniors F2C. However, Jr World Champions could be crowned in A, B and D.

In F2D combat, there were only 19 pilots in the World Cup competition and here Ilia Rediuk UKR defeated Dave Wiseman GBR in the final. Before that we had seen a couple of rocky heats for instance when Dave Wiseman defeated Igor Dementiev with 3-1 and when Robertas Platkauskas won over Ilia Rediuk, also with 3-1. It was also 3-1 when Andrew Shields was defeated by Radek Spatenka.

At the Champs, 51 pilots came to start and we saw many nice heats. For example in round 1 where we had 3 heats with 3-1 in cuts; Stanislav Chorny won over Armen Vardanyan, Dave Wiseman won over Kimmo Valkonen and then Vitaly Kochunts defeated Ivan

Chorny. Audrius Rastenis had to fight more against the Bulgarian junior Michael Vasilev but in the end he managed to win with 3-2. A Nordic meeting came in round 2 when Jussi Forss gave Kent Thorup his second loss after winning with 3-1. Vytautas Rimsa had 3-2 against Natasha Dementieva but despite this did not manage to win as his air time was worse.

Then in round 4 there were again many cuts for Jussi Forss when he won over Andreiy Umryhin (3-0). Both Natasha Dementieva and Nino Usala had 3-2 in their heats against Gintaras Kucklailis and Benjamin Vazquez Perez respectively. Natasha won while Nino lost as his air time was worse than his opponent's. Andre Bertelsen had also 3-1 in his heat against Xavier Segarra Zorilla and thus won. Round 5 was not so successful for the Chorny family as Stanislav first lost to Andrew Shields (3-2 to GBR) after which Ivan was defeated by Benjamin Vazquez Perez (3-1 to ESP). Round 7 saw Audrius Rastenis knock out Manuel Mateo after 3-0 in cuts. In the end, Jussi Forss and Audrius Rastenis went to the final and as both of them had no loss before, we knew there would be several final heats.

The first was even with 1-1 in cuts but 9 seconds more air time for Jussi. Audrius also received -40 for a foul when he did one hard landing (you may call it crash!). When we then got to the second final, Jussi seemed to have made his mind up even before the start of the heat not to give Audrius any chance. After 2.02 the heat could be blown off as both streamers were gone and we had a new World Champion as Jussi won with 2-1. Then Jussi was celebrated high and low and back and forth and it was a very well-deserved win. Jussi has been at the top in several championships but never before reached the final. Congratulations Jussi, we all say! Junior World Champion was Ivan Chorny from Ukraine.

/Ingemar Larsson

*The Rimsa (LTU) family;
Tomas, Vytautas and Simonas.*



*Junior fly-off for 2nd place
between Xavier Segarra Zorilla
ESP and Tomas Rimsa LTU.*

*Jussi Forss FIN
The 2022 World Champion in F2D*



Nostalgia -

FAI F2D World Champs podiums



While F2A, F2B and F2C received their World Champs status already in 1960, F2D had to wait until 1978. The reasons for this were certainly several; partly you started flying combat later and partly it took a while before you found the format for the class. If you read competition reports from the late 50's or 60's, you note that there were many discussions regarding rule interpretations and biased/ignorant judges, maybe due to unclear or incomplete rules. The fact that you often flew over tarmac was perhaps not conducive to the class either.

Gradually, the rules were improved and it can be said that in the early 70's they had begun to take their current form. So in 1975 FAI/CIAM gave official Championship status to F2D and the European Championships held in Verviers Belgium 1975 became the first championship for the class, even it was a Continental Championship. In this period it was also decided that the 1978 World Champs would be the first Championship where F2D would have the same status as the other three classes.

Holland had run the Dutch Combat International for a couple of years and when the status decision came from FAI/CIAM, the Dutch were not slow to call their competition in 1976 "Preliminary F2D World Championships" (See Lina 2-2015). The competition was run in Rotterdam the week before the "regular" World Champs was to be held in Utrecht and a total of 98 pilots from 12 countries came to start and the whole event was a great success. The competition also showed that it was indeed time for F2D to achieve Championship status.

1976 - 1980



The 1978 final between Mick Tiernan and Dave Wood. Note the absence of helmets and safety nets with all spectators standing close to the circle. John Hammersley acted CM.



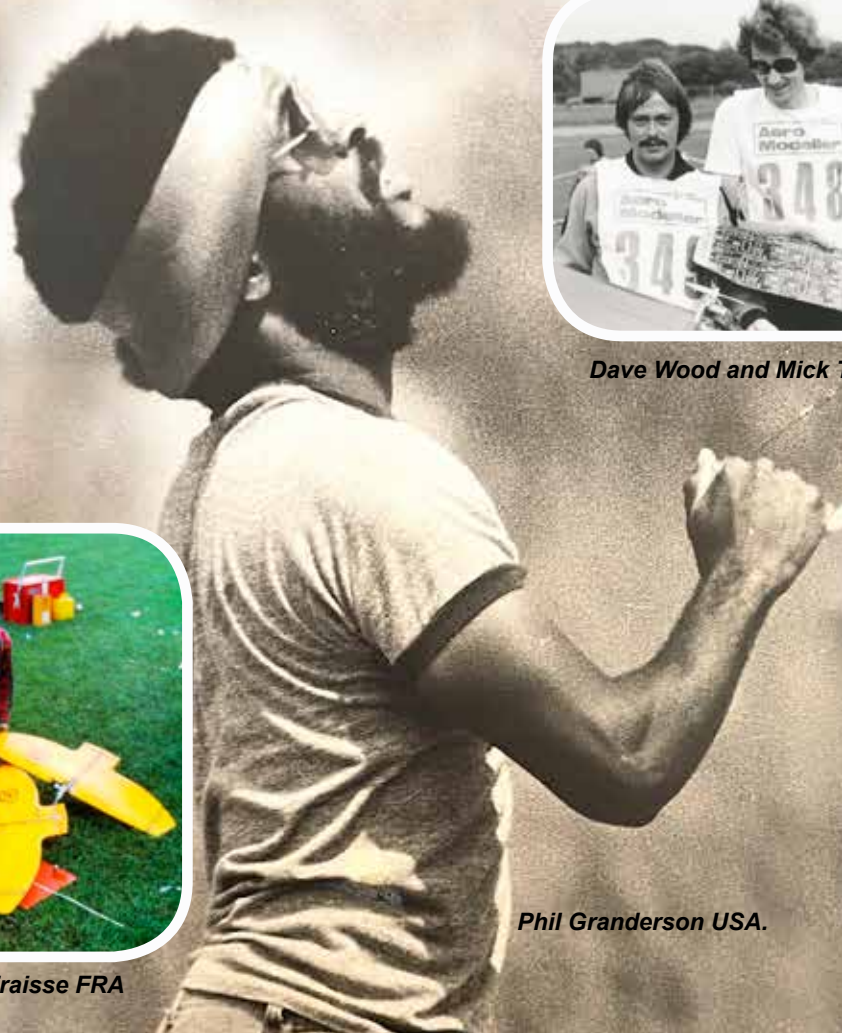
Dave Wood and Mick Tiernan.



Oleg Doroschenko USSR and Bert Gijsbertsen NED.



J-M Fraise FRA



Phil Granderson USA.

Preliminary World Champs: 1976 Rotterdam Netherlands (98)

- | | |
|-------------------|-----|
| 1 John Berry | GBR |
| 2 Richard Wilkens | GBR |
| 3 Jacco de Ridder | NED |

1978 Woodvale Great Britain (44)

- | | |
|----------------------|-----|
| 1 Mick Tiernan | GBR |
| 2 Dave Wood | GBR |
| 3 Jean-Michel Fraise | FRA |

1980 Czestochowa Poland (51)

- | | |
|--------------------|------|
| 1 Oleg Doroschenko | USSR |
| 2 Bert Gijsbertsen | NED |
| 3 Phil Granderson | USA |

1982 - 1988



An 18 year old Tom Fluker
USA won in Sweden 1982.



Pertti Salerma FIN.



Uffe Edslev DEN.



Roland Forstner BRD.



Loet Wakkerman NED.



Fred Meijer NED.



Neil Gill GBR.

So in 1978 it was time for the World Champs in Liverpool, Great Britain, and what was more appropriate than two Englishmen flying the final? Great Britain had dominated the combat scene for many years so it was only natural that Mick Tiernan should be the first to lift a World Champs Trophy in F2D.

The rules you flew by in the 70's and a bit into the 80's, helmets were required for the mechanics, but the pilots only needed to have a helmet if they ran out to the model. Judges and other officials also did not have to wear helmets and nets around the circles did not exist while spectators could gather only meters outside the flying circle. The lines were 0.3 mm thick and the engines did not need to be fitted with silencers. Eventually, several rule issues were discovered that needed to be rewritten or clarified and towards the end of the 80's a major revision was made. Then it took until 2010 before the next major revision was made and the rules that came then are more or less the same as today.

What has been introduced over the years is a minimum line diameter of 0.385 mm, 4 mm venture intake, muffler with 6 mm exhaust, mandatory helmet for all involved, safety strap, safety nets and safety distance to the audience, mixing of synthetic oil in the fuel and shut-off device to be triggered if the model flies away. Several regulations that have come have focused on increasing safety and reducing noise levels.



Nikolay Necheukhin USSR.



Bjarne Schou DEN.



Boris Faizov USSR.

1982 Oxelösund Sweden (47)

- | | |
|------------------|-----|
| 1 Tom Fluker | USA |
| 2 Uffe Edslev | DEN |
| 3 Pertti Salerma | FIN |

1984 Chicopee USA (42)

- | | |
|-------------------|-----|
| 1 Loet Wakkerman | NED |
| 2 Fred Meijer | NED |
| 3 Roland Forstner | BRD |

1986 Pecs Hungary (46)

- | | |
|----------------------|------|
| 1 Nikolay Necheukhin | USSR |
| 2 Alexei Beliaev | USSR |
| 3 Bjarne Schou | DEN |

1988 Kiev USSR (42)

- | | |
|----------------------|------|
| 1 Boris Faizov | USSR |
| 2 Neil Gill | GBR |
| 3 Nikolay Necheukhin | USSR |



Henning Forbech DEN.



Vlacheslav Beliaev RUS.



Ingvar Abrahamsson SWE.



The 1990 podium in France with Mervyn Jones GBR, Vlacheslav Beliaev RUS and Henning Forbech DEN.

From only flying with diesel engines and models built in balsa, a change took place around 1975 when more and more pilots used glow engines and models cut out of styrofoam (it "snowed" a lot during the heats during a certain period!!). From the 80's onwards, the glow engine took over completely and the model construction we see today with a strong leading edge and wing built up with balsa ribs has been around for over 30 years, mainly due to it being a durable construction that is suitable for the class. Composites such as Carbon fiber and Kevlar are used to reinforce, but the attempts we have seen with models where the main component has been composites have never succeeded.

The majority of Championships have been held in Europe although there have been exceptions (USA 1984 and 2004, China 1994 and Australia 2016) and the number of pilots has fluctuated between 40 and 100. An increase was seen after each country also was allowed to have 1 junior in the team and now most recently with the fact that you are also allowed to have a female participant.

Two pilots, Vlacheslav Beliaev and Igor Trifonov, have both won 3 World Champs titles while Audrius Rastenis and Stanislav Chorny have two titles each. This means that during the 22 World Champs that have been held, we have crowned 16 different Champions from 8 different countries. If we look at

1990 - 1996

1990 Blenod France (46)

- | | | |
|---|--------------------|-----|
| 1 | Vlacheslav Beliaev | RUS |
| 2 | Mervyn Jones | GBR |
| 3 | Henning Forbech | DEN |

1992 Hradec Kralove (58) Czechoslovakia

- | | | |
|---|--------------------|-----|
| 1 | Vlacheslav Beliaev | RUS |
| 2 | Ingvar Abrahamsson | SWE |
| 3 | Mervyn Jones | GBR |

1994 Shanghai China (43)

- | | | |
|---|--------------------|-----|
| 1 | Mervyn Jones | GBR |
| 2 | Vlacheslav Beliaev | RUS |
| 3 | Boris Faizov | RUS |

1996 Norrköping Sweden (63)

- | | | |
|---|--------------------|-----|
| 1 | Vlacheslav Beliaev | RUS |
| 2 | Dmitri Bazulin Jun | RUS |
| 3 | Loet Wakkerman | NED |



Mervyn Jones GBR.



The podium in China in 1994 with Vlacheslav Beliaev RUS, Mervyn Jones GBR and Boris Faizov RUS.

1998 - 2004



Stanislav Chorny and Alexei Zhelezko, both UKR.



Igor Milenin UKR.



Volodymyr Vesich UKR.



Igor Zholnerkevich BLR together with CM Mack Henry.



A young Stanislav Chorny UKR.



Mike Willcox USA.



Henning Forbech DEN and Boris Faizov RUS.



Boris Faizov RUS.



Igor Trifonov RUS.



Alexander Shalaev RUS.

1998 Kiev Ukraine (55)

- 1 Alexei Zhelezko UKR
- 2 Sergei Beliaev RUS
- 3 Igor Milenin UKR

2000 Landres France (66)

- 1 Stanislav Chorny UKR
- 2 Igor Milenin UKR
- 3 Igor Zolnerkevich BLR

2002 Sebnitz Germany (86)

- 1 Mike Willcox USA
- 2 Boris Faizov RUS
- 3 Volodymyr Vesich UKR

2004 Muncie USA (57)

- 1 Igor Trifonov RUS
- 2 Alexander Shalaev Jun RUS
- 3 Boris Faizov RUS

2006 - 2012

2006 Valladolid Spain (58)

- 1 Igor Trifonov RUS
- 2 Artern Markov Jun RUS
- 3 Ivan MacKenzie CAN

2008 Landres France (92)

- 1 Stanislav Culacichin MDA
- 2 Aleksandr Pokorskiy Jun UKR
- 3 Igor Dementiev MDA

2010 Guyla Hungary (77)

- 1 Igor Trifonov RUS
- 2 Audrius Rastenis LTU
- 3 Jose Luis Lopez ESP

2012 Pazardzhik Bulgaria (82)

- 1 Audrius Rastenis LTU
- 2 Igor Trifonov RUS
- 3 Igor Dementiev MDA

Ivan MacKenzie CAN flanked by David Lofgren and his brother Pat MacKenzie.



2008 final between Stanislav Culacichin MDA and Aleksandr Pokorskiy UKR.



Stanislav Culacichin MDA and Audrius Rastenis LTU.



Artern Markov RUS and Igor Trifonov RUS.



Stanislav Culacichin MDA.



Semifinal in 2008 between Igor Dementiev MDA and Aleksandr Pokorskiy UKR.



Jose Luis Lopez ESP.



Aleksandr Pokorskiy UKR.



Igor Dementiev MDA, Jussi Forss FIN and Audrius Rastenis LTU.



Rudolf Königshofer AUT.

2014 - 2022



Pavel Narkevich RUS.



Timo Forss FIN and Andre Bertelsen DEN in the fly-off for 2nd place in 2018.



Iliia Rediuk UKR.



Aleksander Prokofjevs LAT.

2014 Wloclawek Poland (77)

- | | |
|----------------------|-----|
| 1 Stanislav Chornyy | UKR |
| 2 Henning Forbech | DEN |
| 3 Rudolf Königshofer | AUT |

2016 Perth Australia (53)

- | | |
|------------------------|-----|
| 1 Iliia Rediuk Jun | UKR |
| 2 Pavel Narkevich | RUS |
| 3 Alexander Prokofjevs | LAT |

2018 Landres France (84)

- | | |
|--------------------|-----|
| 1 Audrius Rastenis | LTU |
| 2 Timo Forss | FIN |
| 3 André Bertelsen | DEN |

2022 Wloclawek Poland (52)

- | | |
|--------------------|-----|
| 1 Jussi Forss | FIN |
| 2 Audrius Rastenis | LTU |
| 3 Igor Dementiev | MDA |

the number of medals for each pilot it is still Vlasheslav Beliaev (3+1+0) and Igor Trifonov (3+1+0) at the top followed by Audrius Rastenis (2+2+0) and Boris Faizov (1+1+2). Then we find Mervyn Jones (1+1+1) and Igor Dementiev (0+0+3).

This will end the History of Podiums in F2D at World Championships. Just as I wrote after last year's article about F2A, it has been a pleasure to go through and compile the material, especially as I myself have been involved, first as a pilot and later as a Judge, since the first Euro Champ competition in 1975 and the first World Champ competition in 1978.

A big thank you to Bjarne Schou, Henning Forbech, Kathleen Granderson, Roger Silcock, Igor Milenin, Bert Gijsbertson and Mervyn Jones who contributed with photos. Unfortunately there are a few pilots that I haven't been able to find any photos of.

/Ingemar Larsson



Rudi Königshofer AUT, Stanislav Chornyy UKR and Henning Forbech DEN.



Audrius Rastenis LTU and Jussi Forss FIN.



59th Coppa d'Oro



Bjarne Schou and Steen Lysgaard were two of all Danish pilots present.

It was nice to be back in Lugo and Italy again after the covid period. Just as in 2019 the local club went for a double World Cup (GBR+ITA) which meant several days of joy meeting friends but also tasting good food and wine. Unfortunately we saw a decrease in number of competitors for the GBR World Cup compared to 2019. Hard to say why but hopefully it will be better next year.

Thursday began with some rain and the start was delayed until after lunch. F2A saw 3 of the 5 pilots pass 300 km/h. That our two British pilots did it gave no high odds but that Bill Hughes did it here but not at the World Champs some weeks earlier was more of a surprise. Maybe his engines like the Italian air better? In F2G (Electric speed) Daniel Rota did impressive 308,2 km/h.

F2B had only 12 pilots but they were on the other hand from 7 different countries with France and Ukraine taking the top positions. F2C was, together with F2D, the class with most competitors, here 16 teams, but no one of them succeeded in getting a time better

than 3.13. The final ended up with Makarenko/Osadchii being the only team getting a time as the other managed to mess it up at the third pit stop.

F2D Combat saw 35 pilots enter, more or less the limit number of pilots to be able to do it in two days taking height for delays due to rain etc. Two heats in round 1 showed more cuts than the others, first when Rediuk UKR won with 4-2 over Osorhean ROU and second when Tsukov EST won over Champain FRA with 2 minutes better time although it was 3-3 in cuts. But Benoit Champain kept the pace and took three cuts again in round 2 when he defeated Kent Thorup with 3-0. Believe it or not but Benoit had 3 cuts in round 3 too! Unfortunately he lost as Sergei Uzkih took 5 cuts! Ilia Rediuk showed that he have a feeling for taking cuts as he, in round 4, made Antonio Giandrini a tourist after a 6-2 match. Round 5 saw a very nice fight between Morten Fries-Nielsen and Ivan Chornyy but Morten lost and went out as Ivan had 4-3 in cuts. For round 6 we had 6 pilots left; 3 from Ukraine, 2 from Denmark and 1 from Estonia and when all dust had blown away we were left with 3 Ukrainian pilots. As they had been flying well and fair throughout the contest it was well deserved for them to take all podium places.

On Saturday and Sunday the traditionally Coppa d'Oro was held for the 59th time which is very impressive. Can't be so many competitions around the world with a history like that While F2B and F2C had a significant increase in number of pilots (both went to 24 pilots/teams) compared to the GBR World Cup F2A just had a few more (5 to 7) while F2D had less pilots (35 to 32).

In F2A Luca Grossi challenged the British pilots with a speed they could match and as both Bill Hughes and Niels Lyhne had slower



Ionut Podari ROU and Alexandr Dutov MDA enjoyed the banquet and the food.



How could we manage in F2D without all the ladies helping us? Thank you!



The orchestra at the banquet played a lot of covers and was really good!



Double World Cup in Lugo

times in this contest it was a clear win for Luca. Daniel Rota faced the same in F2G as he couldn't produce the same speed as in the first contest. Instead his fellow countryman Guy Ducas increased to 300 and won F2G. In F2C Igoshyn/Chayka was the only team to reach both finals, this time to be beaten by the two French teams Surugue/Surugue and Ougen/Surugue. F2F was also flown but with just 4 teams on start. In F2B number 1 and 2 from the first contest had to leave space for Italian pilot Marco Valliera that joined for the weekend.

In F2D Denmark was the country with most pilots (6) followed by Germany with and Ukraine plus Italy with 4 each. First heat with many cuts came in round 2 when Stanislav Chornyy won over Alexandr Dutov with 5-0 in cuts. In round 4 one of the most exciting matches were between Steen Lysgaard and Ilia Rediuk where Steen was chasing Ilia's streamer for almost 3 minutes to take the cut he needed to win. But Ilia managed to defend via excellent flying and in the end he won with 1-1 and better air time. In round 4 3 of the 4 remaining Danes went out together with the last Italian pilot. After round 6 we saw 5 pilots in round 7; 3 Ukrainian pilots plus Audrius from Lithuania and Morten from Denmark. Then it went like in the GBR World Cup when Ilia and Ivan went on to the final where Ilia took his second victory for the weekend. In the fly-off for 3rd Audrius managed to prevent an all Ukrainian podium as he won over Stas Chornyy and took the last podium place.

On Sunday evening we could look back at 4 days of nice flying, meeting friends and tasting Italian food&wine. Can it be better? It is definitely a contest date to mark in the calendar for next year!

/Ingemar Larsson



Start in the F2C final in the GBR World Cup. Makarenko (to the right) won!



French F2D team of Xavier, Thomas and Benoit took part in both competitions.



Both the German and Danish teams had one team member to follow each heat with a device where they could enter cuts and air time for both pilots. And then hopefully give a correct decision when to land.



Start in the F2C final of the second contest. Thierry and Oleksii are already in the air while the-winner-to-come Pascal is still waiting to get his engine started.



The pilots from Romania (Ionut and Andrei) and Moldova (Alexandr) helped each other during the contest.



F2G pilots; Zane Stanojevich, Daniel Rota, Guy Ducas and Matthieu Perret.



Ivan, Ilia and Audrius made top three in the second contest.



Lauri Malila was very pleased with his 5th place in F2B.

Austrian F2B Nationals



All competitors, officials and spectators gathered together on one photo!

The Austrian Championships, which takes place every second years, and the Steinfeld Cup in the F2B class were again held at MFC-Weikersdorf (Lower Austria). Hanno Miorini, our C/ L Chairman, the contest director Heimo Stadlbauer and the chairman Karl Nagl with his proven team were able to warmly welcome nine pilots on October 15th, 2022, one pilot came from the Czech Republic and one from Slovakia. The top officials of the ÖAeC were also welcomed by ÖAeC Vice President Christian Faymann and Chairman of Austrian model-pilots Peter Zarfl.

The first round had to be flown in light rain, but the pilots and judges persevered. After the lunch break the rain clouds disappeared and for the next two rounds there was good, wind-free flying weather. Unfortunately, eleven-years-old Junior Gregor Nagl and Adolf Hansemann crashed, so that only seven pilots were able to start in the last round. Every pilot gave his best, every point was fought for and for the Austrians pilots it was about the title "Austrian Champion 2022".

In the afternoon, the winners of the F2B Steinfeld Cup and the Austrian Championship were determined. Franz Wenzel (MBC Günselsdorf) once again won the title "Austrian Champion in the F2B class", followed by Helmut Kofler (MFC Wörgl) and Rudolf Trogbacher (UMFC Neuhofen). The other places were: 4th Daniel Nagl, 5th Hanno Miorini, 6th Adolf Hansemann and 7th the Junior Gregor Nagl.

Pavel Benes from the Czech Republic became the winner of the 2nd Steinfeld Cup, followed by Franz Wenzel and Helmut Kofler. The other places: 4th Svorad Sykocin (Slovakia), 5th Rudolf Trogbacher, 6th Daniel Nagl, 7th BFR Hanno Miorini, 8th Adolf Hansemann and 9th the young Gregor Nagl.

Under the direction of Heimo Stadlbauer, the competition went smoothly, the Jury Roland Dunger, was unemployed. The judges Pavol Barbaric (SVK), Maximilian Marksteiner and Franz Oberhuber judged the 15 figures including take-off and landing. Models with electric motors were in the majority, with combustion engines in two models (Super Tigre 10 cc). The electric models used the AXI 2826 with 5s or 6s batteries which is a tested and reliable setup.



Hanno Miorini with his proven F2B IC powered F2B model.



Gregor Nagl was our youngest pilot.



Rudolf Trogbacher starts his 10 cm³ engine with help of Hanno Miorini.

Steinfeld Cup 2022



Steinfeld Cup 2022: From left CD Heimo Stadlbauer, Franz Wenzel 2nd, Pavel Benes 1st, Helmut Kofler 3rd, Jury Roland Dunger, Austrian C/L Chairman Hanno Miorini and Chairman Karl Nagl.



Franz Marksteiner with his fast and loud racing model.



Austrian Nationals 2022: From left Peter Zarfl, Christian Faymann, Helmut Kofler 2nd, Franz Wenzel 1st, Rudolf Trogbacher 3rd, Jury Roland Dunger and Chairman Karl Nagl.

Without electric motors, but with noisy combustion engines, Franz Marksteiner flew a two-motor speed machine in circles as a demonstration. The engines, MF 15 (2,5 cc), are made by himself and used combat propellers. With a wingspan of 850 mm, a weight of approx. 800 g and a line length of 15.92 m, this machine made of balsa wood raced very fast in circle.

Together with chairman Karl Nagl, Hanno Miorini, Jury Roland Dunger, Christian Faymann and contest director Heimo Stadlbauer carried out the award distribution, with the first three traditionally receiving a lasered trophy. Many thanks to the MFC Weikersdorf under chairman Karl Nagl for organizing the F2B Steinfeld Cup. Thanks also to the kitchen staff, all the helpers and the Manhalter evaluation team.

We look forward to see you again at the 3rd Steinfeld Cup at MFC Weikersdorf in 2023.

Author and photos:
Heimo Stadlbauer
AUT



How to become a World Champion!

Lluís Parramón of Spain will in this article reveal what it takes to become a World Champion in F2A Speed. Read and learn!

Speed Model F2A "BARCELONA 96"

INTRODUCTION

The C/L F2A speed Class, seen from the high competition side has had historically little media coverage. However, it is a discipline highly valued by the true Aeromodeller, by its spirit of improvement in the design, building, testing and flying reaching the limits of Physics and the excellence in sport throughout the years. Those serious Aeromodellers, always thinking how to improve aerodynamics, materials, propellers, engines and exhaust systems, with his hard work, have reached speeds of 300/307 km/h within the present FAI rules, from those of 160/180 km/h of the fifties. A real outstanding improvement!

During the decade of 1950/1960, keen modellers such as Batlló, Giró and Gogorcena got important International triumphs in the F2A class. They were followed by new modellers like Pacheco, Gaya, Benavent and Parramon, who, during the decade of 1970/1980 formed a team with GP development directed by Giró and with a high technical level. The team formed by Pacheco, Gaya and Parramón won the Team Bronze Medal in Verviers in 1975 and in 1981 Parramon got the Gold Medal in Genk.

In this period and using the Italian Rossi 15 engine, they went through a series of tests for fuel management, such as atmospheric pressure, intake, exhaust pressure, centrifugal valve, and reguflow tanks that were used in different Parramon models: Sigalasec



Lluís Parramon with his model and 8 World Championships Gold Medals.



(Flaps revue 189, nov 1975), Xiulet III (Flaps revue 216, april 1978), Espigat 1 (Hobby RC 2 1983) and Xiulet VI (Juguetecnica December 1991). From 1993 and on the Ukrainian Profi 15 became available in the market after the USSR breaking off, representing a great step forward at engine performance. In 1994 a Team Bronze Medal and a fourth place were obtained respectively by Olive, Benavent and Parramón in the World Champs in Shanghai. All this gave us the necessary push to start a new period of innovation and research which led to the Barcelona 96 project. The results during the period 1994-2012 have been outstanding for the Spanish F2A Team in which Parramón won the World Championships at 8 occasions, European Championships at 4 occasions and sat 4 World Records: Norrkoping 1996 - Kiev 1998 - Sebnitz 2002 - Muncie 2004.

OBJECTIVES

From 1993 the main objective, with the new PROF15 engines, was to reach 310km/h with 15,92 m lines and 300 km/h after the rule change of 1997 to 17,69 m lines. A working plan was created, studied, updated, planned and executed: Improvement in Aerodynamics, Weight reduction, improvement in flight stability, improvement in engine and pipe power, study of propellers for transonic and supersonic rpm's and physical and emotional preparation for the pilot as well as the strategy when taking part in a competition.

The Team to design the BARCELONA 96 model required the collaboration of Giro, Roger, Gonzalez and Parramón and allowed the detection of strengths and weaknesses. As a result with the new design, we got the Gold Medal at the 1996 World Championships at Norrkoping and also a new World Record of 311,2 km/h.

We used the aerodynamic tunnel of the ETSEIB School, GPD electric brake motor test bench and various computer programs to perform simulations in: Aerodynamics, Model design, lines, propellers and engines plus all the of technical references we could gather from internet.



Testing symmetrical and asymmetrical models in the wind tunnel of the ETSEIB School.

THE MODEL

It is shown on the BARCELONA 96 plan. Please refer to it for further information.

IMPROVEMENT ACTIONS

1. Aerodynamics

Reducing air drag by decreasing front area, redesigning air cooling inlets, wet area, wing thickness and all possible induced drag sources and also increasing stabilizer stiffness.

2. Design

The weight was reduced to 430 Grams but still meeting the FAI regulation, with the purpose to reduce the influence of the wing and thus its drag. Determine the correct pitching moment considering the gyroscopic effect. Choice of the correct materials for the construction in terms of strength and resistance to vibration and fatigue and matching them to a 2 stroke engine. Optimize the surface ratio between wing and stab as well as that of stab and elevator. Establish the most comfortable relationship of control horn and

handle. Correct position of lead-out/line exit in wing to obtain the most tangential path of model.

3. Engine

Increased power, higher rpm. Studies and design of an exhaust pipe adapted to the new rpm level. New cylinder head and compression adjustment. Increased exhaust area and intake times. New fittings assembly and Ball Bearings. Adjustment in the shut-off system.

THE FUSELAGE

It is made of 50 mm thick Rohacell and of different densities by its light weight and absorption of vibrations. The front part of the fuselage is formed by the Alu pan, CNC machined and to which the engine is bolted and at the rear the Rohacell with a center blade of 2 mm plywood reinforcement to avoid vertical bending and adjusted to the exhaust pipe shape. The Bellcrank is made of 1 mm thick steel plate with a brass tube bearing installed at the center. The outside of the fuselage was reinforced with unidirectional carbon strips of 15 mm width and 65 gr/m² to absorb any horizontal bending. Then body car compound was applied and sanded and then laminated with two fiberglass 25 gr/m² fiberglass tissue and epoxy resin.



Original model in Rohacel.



Balsa variant model.

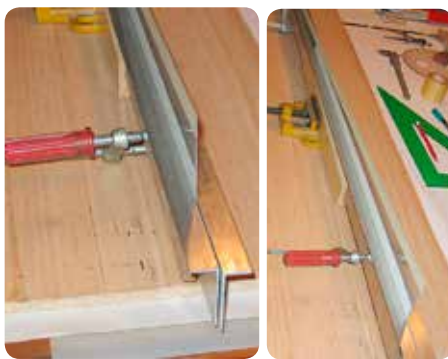
It is very important to thoroughly seal all the Rohacell from the fuel since it is dissolved by methanol. Barcelona 96 have survived in good working conditions for 20 years with only light maintenance.

The cowling consists of two parts, also in 50 kg/m³ Rohacell. The inner part, which holds the fuel tank has two 3x6 mm carbon tubes as separators, allowing the passage for the bolts that fix the outer cover of the engine and part of the exhaust pipe including the cooling tunnel with the cooling inlet and Naca inlets. In the outer part, the two threaded, dural alu inserts M6 and M3 are screwed and epoxied in two poplar reinforcement spars of a mini-

mum hardness 130 kg/m³ that will be glued to the surface in contact with the lower part carrying the fuel tank. The parts touching the housing and the inner cowl are protected with 1 mm plywood. On the inside of the cowl, a layer of fiberglass of 25 g/m² laminated with epoxy is applied. 2 Hex Allen M3 x 50 screws are used to fix the two parts and 2+2 pins of 1 mm rod will also be placed to guide the assembly.

THE WING

In the Barcelona 96, the wing is removable to facilitate the transportation of the two parts; fuselage and wing. The wing is made out of 0,3 mm 1050 aluminum alloy sheet, medium soft. The airfoil section is NACA 0012; 12 % symmetrical. The surface of the wing is 75 % of the total 5 dm² of the model.



Bending tool and clamps for wing.

The wing construction starts by cutting the aluminum sheet by means of a shear or simply by hand with a sharp cutter and a heavy ruler followed by a careful filing of the last 10 mm of the sheet which to help to form the trailing edge, keeping it free from any dirt or oil to achieve the best possible bond with the epoxy resin (slow curing) which will be applied later. Then a 20 mm masking tape is placed lengthwise on the outside trailing and leading edges to serve a guide for the bending operation.

The wing sheet is then folded 90° by means of a bending machine or by means of a home-made jig, formed by two aluminum sections (see photos). Bear in mind to make a 0,5 mm radius to one of the aluminum bending edges to form the inner radius on the leading edge. Out of the jig and with the help of one of the aluminum sections we proceed to further bend the sheet from 90° to 30°. The longitudinal wooden spar will then be mounted sliding it in the housing of the spine and in the area of maximum thickness of the wing, its



Detail of the spar and bellcrank holder. Note the sanded surface of wing sheet.



Finished wing, folded at 30° plus the spar with T-shaped bellcrank holder.

length will reach up to 20 mm from the tip to allow the lead-outs and to run from the wing tip to the bell-crank. A guide is also provided to act as a guide for the lines in the wing and to keep them 5 mm apart.

Then the spar is glued to the inside of the sheet and also the trailing edge clamping inside the jig at about 3 mm from the edge, being very careful not to deform the airfoil (See photos). It is advisable to twist the wing about 1° at the tip. This angle will be adjusted during the test flights if needed.

ASSEMBLING WING TO FUSELAGE

The F2A rules (before 1997) states that the model must use two lines of 15,92 m in length (from the axis of the model to the control handle). To reduce the drag it is extremely important to ensure that the model is on the tangent to the flying path. The drag of the lines increases approximately to the square of the speed and results in a bow shape from model to handle when flying. The model then will adopt different flying attitudes generating variable drag forces. To compensate for that the wing is mounted at an angle with the fuselage which must be set by trial and error, taking into account that it depends on the speed and weight of the model being both variable. Our best results were with about 3°. On the other hand we have the gyroscopic and precession effects applied on the propeller that forces us to set the CG far more advanced than in an airplane for Free Flight for instance. This CG in speed is set from 0° to 0,8° of the MAC, that is from the leading edge to about 8-10 mm ahead. With these settings we get self-stable models

THE STABILIZER

It is a hybrid of Rohacel and hard balsa spars of 100 kg/m³. These form the frame into which the Rohacel plate of 35 kg/m³ is placed. Its area accounts for 27% of the total

model area. The airfoil chosen is the NACA 63006 of 6% thickness. After shaping to the correct airfoil, two layers of 25 and 65 gr/m² are laminated with epoxy and vacuum bagged. Once hardened no further operations are required since the plastic bag gives a perfect pore free surface mirror-like surface. After removing all the laminating flash from the bagging, the elevator is cut. It represents about 10% of the stabilizer area. Previously in the stabilizer a channel is made to accommodate the 20 mm brass tube which is part of the hinge on the fuselage side, then a 1 mm steel rod placed inside a 2x1x20 mm brass piece that forms a part of the horn and completes the hinge. The opposite side is bent 45° and placed inside the channel and glued. The other hinge is located at 3/4 of its length; the movement of the control will be at maximum of about 30°.



Two views, inside and then covered, of the stabilizer construction.

ASSEMBLY OF FUSELAGE + STABILIZER

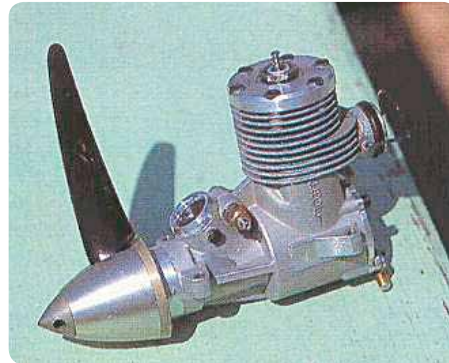
It must always be done on a marble surface and with the help of squares and steel rules. On the inside of the fuselage, the aluminum engine pan is glued to the plywood beam. Fixed on the marble draw, the lines longitudinally at 0° that will be the guides for the assembly. Make a slot in the fuselage and place the stabilizer, first on the inside and then gluing the outer part checking that the incidence is 0° and a dihedral of 2° to protect the stab in landing. The outer part is glued as explained in the FUSELAGE part. It is very important that the control rod moves freely. When we trim for flight, we can move the position of the front screw of the wing spine which will allow us to give the estimated angle of attack of 1.3° which is needed to fly at the mandatory height of 3 to 6 m. The fuselage and stabilizer are finished with polyurethane paint with acrylic in two layers with intermediate sanding and then finally polished. The wings do not require any finishing.



The tank is easily accessible when the cowl is removed.

THE TANK

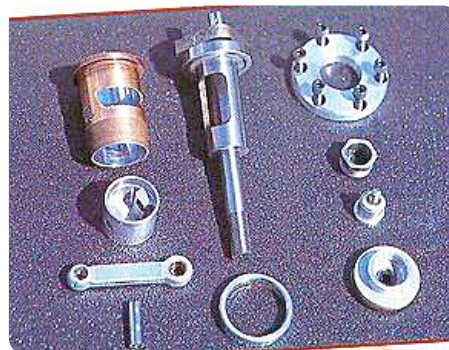
The tank is made with of 0,25 mm galvanized steel plate and soldered with a minimum capacity of 30 cc. It is of the reguflow type and has a baffle with holes of 0.5 mm to avoid foaming with the movement of the fuel, as shown in the drawing. The air inlet tube is 10 mm from the axis of the model and 7 mm from the spray bar. This position can change to a great extent if the flying path is not tangent to the circle. These are critical measures that influence suction during take-off and also for the suction during the flight.



Profi 2.5 Speed 1993.

THE ENGINE

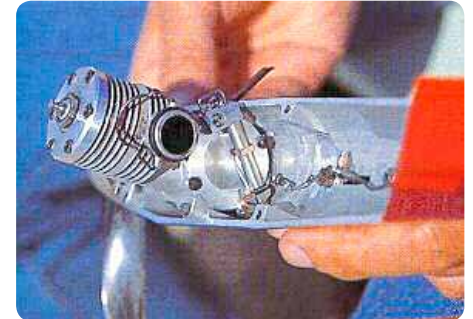
The Ukrainian PROFI 93 speed engine was a very good base for start working, its crankshaft, system "Monolit" is grooved to take the internal bearing balls and the inner ring is removed (integral rear bearing). The crankshaft is 12 mm in diameter and very solid. The crankcase is machined for the bearings allowing assembly and disassembly without wear and holds firm enough to withstand thermal expansion. The cylinder is chromed beryllium bronze with a mirror finished surface. The piston is a 24% silicon Al Alloy cast, fine grained and very stable to thermal expansion. The thermodynamics are modified to allow it to run up to 38000 rpm. The crankshaft intake angle is increased to 23offl and also the internal diameter of the crankshaft to 9 mm. The diameter of the venturi has been increased to 9.5 mm being not critical at all.



The engine disassembled.

The cylinder exhaust port of the cylinder has been extended in height up to 192ffl and its area-time to reach a power increase of 20%, from 1,6 to 2,0 hp and an increase in the speed from 35,000 to 38,000 rpm. The 3 transfers ports have been increased only in the crankcase to improve the flow sec-

tion. The cylinder head has been completely modified to a hemispherical shape instead of the original trumpet increasing the cylinder sweep. To get the right assembly was very difficult and the maximum axial play of the crankshaft is only 0,05 mm. With all this, 2 HP were achieved with the standard legal fuel 80/20.



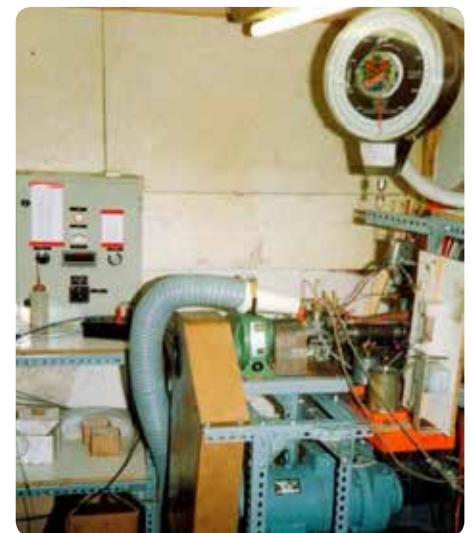
The engine in the pan seen from behind with the mounted shut-off.

THE EXHAUST PIPE

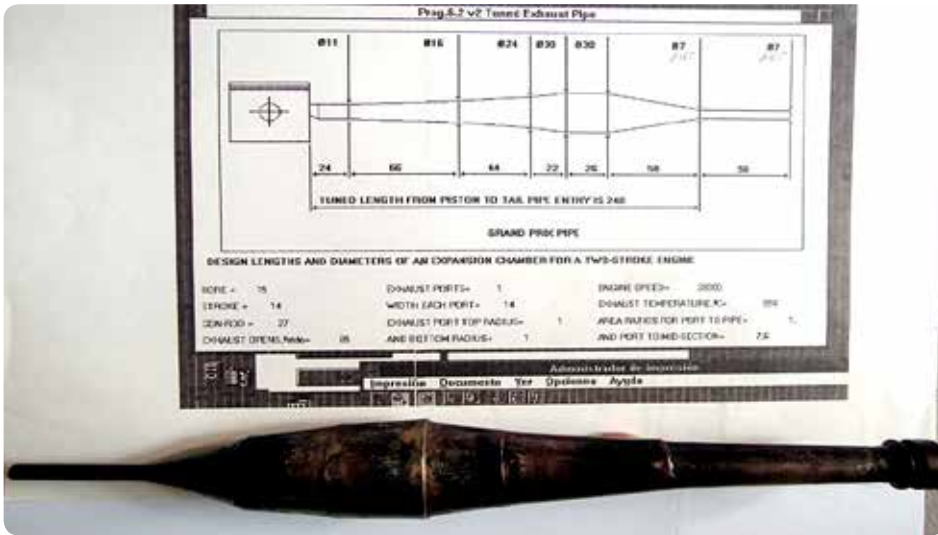
The exhaust pipe has an amplification ratio 1 to 3, it has been studied with Blair's simulation programs, being ideal in its length and diameter at the times and rpm of the engine. The assessment of the rpm in flight were made from the center of the flying circle recording the sound and afterwards studied in the NISSAN laboratory by means of an oscilloscope and edited in a graph that determined the frequency-rpm in flight.



Everything assembled apart from the top cowl and the wing.



Power tests were made in the electrical brake stand of GP Development.



Construction data of the pipe. Also read *The Experimental Study of the Exhaust system of an Egusquiza-Giró model aircraft engine ETSEIT 11/1983.*



Summary sheet/calculation program by *Lluís Roger based on Matushevych 96.*



Another view of the equipment at *GP Development Laboratory.*

THE PROPELLER

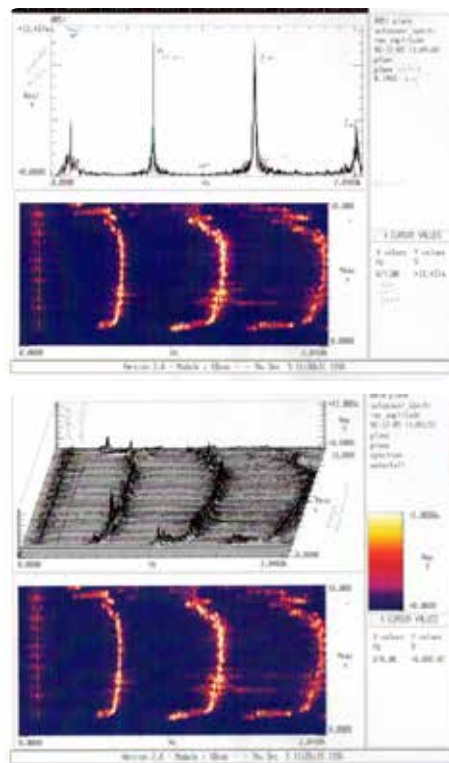
The propeller is single-blade molded in carbon fiber and resin, it is of high rigidity and made by Matushevych in Ukraine. It has been modified concerned diameter according to the simulations of the computer program of Lluís Roger. The geometric pitch, progressive upward, agrees with the theory of propellers, its radius is 74,2 mm and with a pitch of 6.4 inches, at 75% it allow the transfer of the power of the engine with a very acceptable performance despite the fact that at the end of the blade 1.040 km/h is reached. The single blade system improves performance by increasing the Reynolds number because its bigger and by reducing the losses due to the effect of the propeller tip induced vortex. It is an attempt to compensate for the reduction in performance at the blade tip which is well out of the speed range for optimal performance.(600-800 km/h). The propeller blade has several airfoil at the beginning 6412 at 14%, concave convex, 3° incidence , in the middle Clark Y at 10% 3°, and at the tip supersonic 7%, incidence -1°. For the finish it is just painted with epoxy and polished.

THE THEORETICAL HELIX

FLIGHT AND SET-UP

Once the model is finished, it is mounted with the engine, the exhaust pipe and the cowl verifying that the CG, the wing alignment at the theoretical angle of attack and the theoretical angle between the line exit and wing. Next is the trimming at test flights. It is very important, but sometimes forgotten, to check for the exact length of the lines, remember that they account for the 85% of the total drag.

When we trim for flight we can move the position of the front screw of the spine that will allow us to adjust the estimated angle of attack of 1.3° to the wing necessary to fly between 3 and 6 meters of mandatory height. Then, the testing and the dynamic calibration is carried out together with the engine adjustment, observing the height and stability and correcting if needed the wing incidence and the control response. When we are satisfied put the "good" propeller and try again to make the small engine adjustments. When the 295 km/h is reached, the angle between wing and lines must be thoroughly checked again. A small indicator at the wing tip and a mark on the fuselage and the pylon (just a bright piece of tape) will tell if they are aligned or not and therefore need to be fixed.



Calculation of rpm in flight. Recorded with a cassette from the center of the flying circle. Graphic edited by the *NISSAN Iberica Lab at 40.200 rpm.*



View of the propeller that reached 311,2 km/h at the WC in Norrköping.



Ready for flight tests.

It is important that the pilot flies with a certain technique and comfort, avoiding rigidity. This is not possible if you do not follow intense training that will lead to maneuvers as simple as possible during takeoff and pull to prevent the model from advancing you once the handle is placed on the pylon fork. To do this, the simplest thing is that the feet of the pilot are as close as possible to the pylon. The circle described by the feet, will be less than if they are far away and also

F2B competition in Setubal (POR)

October 15th-16th 2022

Valladolid

It is on the stadium where the 1997, 1999 and 2001 European Championships and the 2006 World Championships took place that this competition, bathed in sunshine and mild temperatures, takes place every year in October. This year we saw only 3 categories ; F2B, F2C and F2D! The whole competition benefited from a very light wind. We have to thank the organizer for the pleasant Saturday evening where all the participants had a lot of fun.

In F2B 3 French pilots had made the trip to face the Spanish and Portuguese pilots. If the Spanish didn't want any hard competitors, we were surprised to see Andreï Yatsenko arrive although he had serious problems getting permission to leave Ukraine to defend the colors of his country. After the 3 rounds, Serge Delabarde, with best scores, wins ahead of Andreï Yatsenko and Philippe Rampnoux!

5 teams came to start in F2C but one withdrew (the pilot being in hospital) and another broke its 2 models in training. During the qualifying heats the Barragan brothers achieve the time of 3.13 but they had to give up in the final that now was won by Oterino/Crespi. It was high participation in F2D with 16 pilots. Vernon Hunt led the contest and

it was José Lopez Olivares who won while Xavier Segarra Zorilla won the Junior competition.

Setubal

It is in a natural site, on the edge of the town of Sesimbra, that the Sétubal club have their C7L field. The site is very pleasant, surrounded by nature and yet 200 m from the town and the commercial area. The competition had pilots from 3 nations ; France, Spain and Portugal. Note the participation of Brazilian, Moldavian and Ukrainian pilots who immigrated to Portugal. The weather conditions were excellent and the F2B Judges were able

to appreciate the quality of the flights. The Saturday evening Banquet filled the participants with joy and will leave good memories. At the end of the 3 rounds, Jacky Pigout (France) wins ahead of Rafael Souza and Amilcar Contente (Portugal).

We were amazed by the flight qualities of the original model used by Amilcar Contente with its two stabilizers, one at the front and another at the rear of the model.

Serge Delabarde
FRA



Models of Delabarde and Yatsenko.

29th Open WC Valladolid (ESP)

October 8th-9th 2022





En gammal Genesis som deltog på VM 1982 i Oxelösund, då med pappa Åke Nyström vid handtaget och nyligen på VM 2022 i Wloclawek efter att kärran övertagits av sonen Anders Hellsén 40 år senare.

Återigen dags för SM i Västerås men i år blev det något färre deltagare än vi normalt har även om F2D till slut fick 6 piloter till start (vilket vi inte haft på många år). I alla fall försökte de som kom ha så trevligt som möjligt och detta inledes redan på fredagen då de flesta anlände för att skruva, träna och umgås. Fredagens träningsflygningar bjöd på sydlig vind över skogen. Vinden var visserligen relativt svag, men lite turbulent och med växlande riktning.

Då vi var så få deltagare flögs inga klasser parallellt och dessutom kunde F2B-flygarna göra alla sina tre uppvisningar i asfaltcirkeln. Lördagen inleddes med F2A Speed och för ovanlighetens skull fick 80% av startfältet en tid, något vi inte är vana vid. Vid andra omgången, som också kördes under lördagen, fick även vår norrlänning, Ulf Nygren, en tid vilket gjorde att man såg en hård kamp framför sig inför söndagens omgångar. Men icke! Det enda som hände var att Uffe nådde sitt mål att komma över

200 km/h vilket gjorde att han och Mart bytte plats i botten av listan. Ohotad, men med bleka tider, kunde Per än en gång hämta ut sin guldmedalj (typ femtioelfte i ordningen). När ska någon utmana honom på allvar?

F2B på SM 2022 blev ett SM med färre deltagare än normalt då vi på fredagen fick besked om att både Niklas Löfroth och Emil Palm blivit sjuka och inte kunde komma. Kanske något de dragit med sig hem från VM i Polen? Så de fyra som var i Västerås fick kämpa om tre medaljer.

Anders Hellsén skulle komma till start med en för honom helt ny kärra. Torbjörn Lundgren hade nämligen, dagarna innan, varit hos Niklas Löfroth i Karlstad och hämtat upp en av Niklas gamla Trivial Pursuit, RTF, med Enya 61 och pipa. Vad gör man när hobbyrum (och hus) börjar översvämmas av gamla kärror? Jo, man säljer dem till bättre behövande. Anders fick lite pipmotortips och behövde bara ett par tre starter innan han var tillbaka på sin nivå

SM I VÄSTERÅS 20–21 AUGUSTI



Från vänster: Staffan Ekström, Anders Hellsén, Michael Palm och Lennart Nord.

(eller bättre) från VM. En naturbegåvning! Naturligtvis en bra kärra också. På lördagen hade vinden vridit till västlig och det var i det närmaste ideala förhållanden. Ingen turbulens och molnig himmel. Det blev bara en F2B-omgång på lördagen då F2B-piloterna hade fullt upp med tid- och klippräkning i combaten (något de utförde med bravur!). Efter lördagens omgång ledde Lennart Nord före Staffan Ekström med Anders och Michael Palm därefter.

Söndagen bjöd återigen på bra förhållande, liknande lördagen. De två resterande omgångarna flöt på bra utan missöden och allt kom att avgöras i sista omgången. När poängen var sluträknade hade Staffan lyckats ta sig förbi Lennart och fick återigen ta guldmedalj, vandringspris och diplom med sig hem. Naturligtvis saknade vi Ove Andersson i startfältet (liksom övriga potentiella deltagare). Dock var han på plats, med sin Mustang, men huvuddelen av sin tid ägnade han åt praktiska detaljer kring arrangemanget. Tack till domartrion Johan Larsson, Stefan Karlsson och Ingemar Larsson!

F2C hade bara tre lag och alla valde att flyga tre omgångar för att försöka få bästa startposition in i finalen. Insatserna från alla lagen var inget som kommer att omnämnas i historieböckerna, ej heller finalen där Guffy/Jonatan var de enda som fick en tid och därmed får kalla sig svenska mästare för ett år framåt.

Årets glädjeämne får nog sägas vara F2D Combat eftersom vi fick hela 6 piloter till start. Och ett av de trevligare inslagen var att se Bernt Gustavsson från LEN i cirkeln då det var runt 50 år sedan han flög combat. Även om han var utslagen efter två omgångar såg det ut som han njöt i fulla drag hela helgen. Kanske kan vi också få se honom i Slow och 1,5 framöver? Karlskoga mönstrade hela sitt manskap genom Kent, Jonatan och Niklas men Jonatan fick göra



Även om det bara var tre lag i F2C blev heaten ändå en kamp om att få en bra startposition i finalen. Per flyger obekymrat på medan Johan är på väg att bli omflugen av Jonathan.



Mart gjorde sitt bästa i Speed-cirkeln men fick tyvärr se sig slagen av sina medtävlande.



Trots att Per inte nådde upp till sin vanliga nivå så kunde han ändå bärga SM-guldet i F2A.



Guffy i perfekt position för att fånga den landande F2C-modellen.

Bernt sällskap efter omgång 2. Inför omgång 3 var det bara Lennart och Kent med två liv men Lennart och Johan såg snabbt till att göra sig av med hoten från Karlskoga. Och inför finalen hade båda bara ett liv kvar. I finalen hade Johan bestämt sig för att inte ge Lennart någon chans och vann med klara 2-0 i klipp.

I lagtävlingen visste alla innan start att Västerås skulle vinna. Karlskoga tog silver tack vare sina tre tävlande. Trelleborg har ju prenumererat på lag-medaljer i flera år men med Lars Roos frånvaro kunde deras One-Man-Show Staffan inte hålla undan för Vänersborgs One-Man-Show Johan. Även om båda vann varsitt SM kunde Johan addera poäng för sin F2C-insats vilket i slutändan blev avgörande.

På söndagen kunde vi alla summera en trevlig helg med bra väder i Västerås. Stort tack till alla som hjälpte till att göra arrangemanget lyckat.

Ingemar Larsson och Staffan Ekström



Bernt Gustavsson från Linköping gjorde en bejublad comeback i F2D efter 50 års frånvaro.



De tre medaljörerna i Combat, Lennart, Johan och Kent, sken ikapp med solen i Västerås.



RESULTAT SVENSKA MÄSTERSKAPEN 2022 Johannisberg, Västerås 20–21 augusti

F2A Speed

Placering, Namn	Klubb	1	2	3	4
1 Per Stjärnesund	Västerås FK Modell	268,2	274,4	-	278,8
2 B-O Samuelsson	Västerås FK Modell	249,4	0	262,5	0
3 Ola Murelius	Västerås FK Modell	228,5	0	0	0
4 Ulf Nygren	Team Tornado	123,4	0	163,6	207,1
5 Mart Sakalov	Västerås FK Modell	165,4	207,0	0	0

F2B Stunt

Placering, Namn	Klubb	1	2	3	2 bästa
1 Staffan Ekström	Trelleborgs MFK	986	1039	1043	2082
2 Lennart Nord	Västerås FK Modell	1006	1022	1040	2062
3 Anders Hellsén	MFK Snobben	902	949	1001	1950
4 Michael Palm	Kungsbacka MFK	884	915	924	1839

F2C Team Racing

Placering, Namn	Klubb	1	2	3	4	Final
1 Jan Gustafsson	Västerås FK Modell	3.34,5	31 v	-	29 v	8.19,8
Jonatan Karlsson	Karlskoga MFK					
2 Lennart Nord	Västerås FK Modell	33 v	Disk	-	4.17,2	150 v
Johan Larsson	Vänersborgs MFK					
3 Niklas Karlsson	Karlskoga MFK	4.12,5	85 v	-	38 v	Disk
Per Stjärnesund	Västerås FK Modell					

F2D Combat

Placering, Namn	Klubb	1	2	3	4	5	6
1 Johan Larsson	Vänersborgs MFK	1 V (580)	5 F (500)	7 V (510)	9 V (528)	10 V (352)	11 V (556)
2 Lennart Nord	Västerås FK M	2 V (552)	6 V (580)	8 V (608)	9 F (428)	11 F (244)	
3 Kent Hedberg	Karlskoga MFK	3 V (576)	5 V (586)	8 F (502)	10 F (276)		
4 Niklas Karlsson	Karlskoga MFK	2 F (448)	4 V (540)	7 F (212)			
5 Bernt Gustavsson	LEN		3 F (244)	4 F (170)			
5 Jonatan Karlsson	Karlskoga MFK		1 F (346)	6 F (426)			

Lag-SM

Placering, Klubb	Summa
1 Västerås FK Modellflyg	28
2 Karlskoga MFK	12,5
3 Vänersborgs MFK	8
4 Trelleborgs MFK	5
5 MFK Snobben	3
6 Kungsbacka MFK	2
6 Team Tornado	2
8 LEN	1,5

Domare

F2A	Ove Kjellberg
F2C:	Bengt-Olof Samuelsson
F2B:	Johan Larsson, Stefan Karlsson, Ingemar Larsson
F2D:	Stefan Karlsson / Bengt-Olof Samuelsson

Norgesmesterskap 2022



Harry, Per, Mikal, Clamer, Jan och Norvald.

Årets NM ble arrangert på fotballbanen til Hvam VgS Lørdag 20 August. Været var utmerket, men det blåste litt utover dagen. Resultatet i F2B ble litt overraskende da de for første gang på lang lang tid ble det en annen vinner enn Clamer Meltzer. Harry Kolberg fløy meget bra med sin egen konstruerte og egenbygde elektro modell og ble dermed Norgesmester. Dommer var Marthe Meltzer (Clamer's datter). Clamer og Per fløy med Yatsenko Shark med glow motor. Norvald fløy med en ny La5e elektro. Modellen er bygget av Aleksandr Leonidov i Khar-kiv Ukraina og den flyr meget bra.

Harry Kolberg vant også Weatherman. Alle deltagere i W.man brukte DA Drabant.

Norvald Olsvold



Harry fløy med sin egenkonstruerte el-modell.



Stuntmodellerna med Leonidov LA5e i förgrunden.



Clamer flyger och domare Marthe står i bakgrunden och bedömer.



Harry startar sin DA Drabant.

Resultat F2B

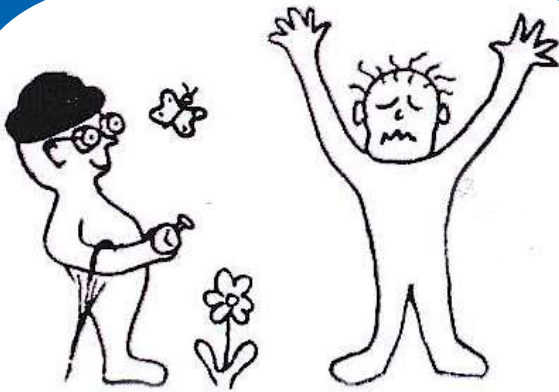
Placering, Namn	Klubb	1	2	3	4	2 bästa
1. Harry Kolberg	Skedsmo MFK	991,0	904,0	966,0	892,5	1957,0
2. Clamer Meltzer	Stjørdals MFK	979,0	954,5	961,5	966,0	1945,0
3. Norvald Olsvold	Os Aeroklubb	943,0	874,5	0	0	1817,5
4. Per Vassbotn	Agder MFK	897,0	851,0	879,5	271,0	1776,5
5. Jan Wold	Skedsmo MFK	126,0	0	0	0	126,0

Resultat Weatherman Vintage Speed

Placering, Namn	Klubb	Klass	Tid	Hast. %	Motor
1. Harry Kolberg	Skedsmp MFK	2.5DA	25,8	112,2	96,9 DA Drabant
2. Jan Wold	Skedsmo MFK	2.5DA	27,2	106,5	91,9 DA Drabant
3. Clamer Meltzer	Stjørdals MFK	2.5DA	27,8	104,2	89,9 DA Drabant
4. Mikal Hansen	Agder MFK	2.5DA	30,6	94,6	81,7 DA Drabant

Amusements

A Paint Book for Modellers



*Look at the time keeper
Look at his glasses
Aren't they thick?
Paint his glasses blue
He's happy
He has just discovered a model
Paint the contestant desperate*

*Look at the speed
He only has one li
Then it is much m
but his model goe
because it has a p
Paint the pilot dizz
Paint the pipe in a*

As a change there are no questions to answer or send in this year. Instead we have a Paint Book for modellers that probably will occupy you for some time (maybe together with your grandchildren?). Many thanks to Ulf Larsson for the sketches.

Answers to last years motor quiz:

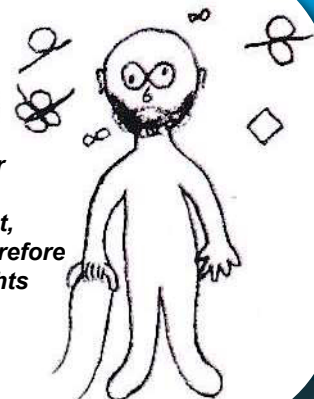
- | | |
|------------------|--------------------------|
| 1 Bugl | 2 Alag |
| 3 Cipolla Junior | 4 DA Drabant |
| 5 ED 2,46 | 6 Enya 15D |
| 7 ETA 15 | 8 HP 15D |
| 9 MP Jet 09 | 10 MVVS D7 |
| 11 Mars D2 | 12 PAW 09 |
| 13 Ritm | 14 Stelz 15 |
| 15 Fora 09 | 16 Webra Rekord |
| 17 KMD | 18 Nelson |
| 19 THK 09 | 20 Fora 15 |
| 21 Webra Mach II | 22 Oliver Tiger Mk III |
| 23 Rossi 15 | 24 Viking |
| 25 ST G20/15D | 26 Davies Charlton Sabre |
| 27 OS 15D | 28 Rothwell 3,2 |
| 29 Mills | 30 Rivers Silver Streak |
| 31 FOK 10 | 32 ED Comp Special Mk II |

Winners:

- | | |
|--------------------|----------------|
| 1 Göran Olsson | SWE 31 correct |
| 2 Maris Dislers | AUS 29 correct |
| 3 Jan Wold | NOR 28 correct |
| Jens Geschwendtner | DEN 28 correct |
| 5 Harry Kolberg | NOR 27 correct |
| 6 Jose Manuel Rojo | ESP 25 correct |
| Ola Murelius | SWE 25 correct |
| 8 Lennart Nord | SWE 15 correct |



*Look at the F/F competitor
Note his wandering gaze
Paint the eyes bloodshot
He is looking for the model
He had forgotten to light the fuse
that must not be forgotten
Paint the fuse long*

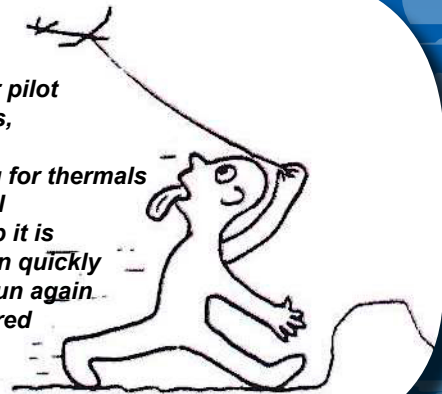


*Look at the stunt flyer
He steer with lines
He must exercise a lot,
almost every day, therefore
his eyes look like eights
Paint the eights pink*

flyer
ne
ore difficult
s fast
ipe!
y
well-tuned tone



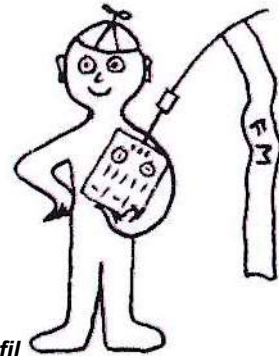
Look at the glider pilot
Look how he runs,
hear him gasp
It's called looking for thermals
Look at his model
Look how high up it is
but it comes down quickly
Then he gets to run again
Paint his tongue red



Look at the team race flyer
He has flown at 3 and 30
but it was a long time ago
Now it's not going so well anymore
but at least paint him hopeful



Look at the propofil
He has many channels on his device
A channel for mom
A channel for dad
and one for little little brother
Paint the channels in different colors
Paint the propofil in a rich banknote green shade
Paint the FM band red



Look at the scale flyer
Look at his model
Isn't it beautiful?
Every little screw is to scale
Paint the model nicely
Paint the screws shiny
The model can also fly
although not so good
Paint the pilot in a proper scale



Look at the combat pilot
Look at his lines
Look how messed up they are
He has many models,
almost all are broken
Paint him defeated



På spaning efter den tid som flytt...

Likt Marcel Proust kommer jag att filosofera om svunna tider i allmänhet och modellflyg i synnerhet. Dock är denna essä inte på 3000 sidor utan lite mer lämplig för en avkopplande läsupplevelse i julkhelgen. Notera att jag inte gör anspråk på att innehållet är i någon som helst kronologisk ordning!

Åren runt 1950 inleddes en tid av förhoppningar. Kriget var slut och framtiden ljus. Ingen kunde ana att vi under många år skulle komma att leva i atomhotets skugga eller att industrialiseringen och den förbättrade levnadsstandaren kunde vara negativ? Så fulla av framtidsoptimism flyttade mina föräldrar från Värmland till Sundbyberg där min far fick jobb som finmekaniker på Marabou. Marabouparken finns fortfarande kvar och är öppen för allmänheten. Om det var tomt i parkens damm gick det att köra med en liten plåtbåt som puffades framåt av Metatabletter. Fast då fick någon vuxen vara med. Tändstickor var inget vi barn fick handskas med, plus att båten blev så varm att man brände sig. Funktionen var exakt densamma som i en kaffebryggare. Vatten hettas upp, ångan expanderar och trycker ut vattnet tills ångblåsan kollapsar så nytt vatten sugts in och förloppet börjar om.



Hur som helst uppmuntrades de anställda att komma ifrån trångboddheten och bygga "egna hem". I början av 50-talet tog så ett 10-tal personer klivet för att förverkliga drömmen om att slippa r'an med gaspoletter och badrum i källaren till att börja bygga sig en framtid i Barkarby.

Vi barn fann mycket nöje i att försöka pilla loss stubintråd, glimmande glasbitar och annat vackert ur de nyanlagda vägarna i området vilka hade grundlagts med slagg från sopstationen i Lövsta. Inte långt bort rullade "Silverpilen" sakta förbi på sin färd mot Ridersvik. Soptåget alltså. På 50-talet gick det persontrafik med ånglok längs Lövstabanen och det fanns ett litet stationshus i Skälby bara något kvarter från där där Ove och Jan-Erik Kjellberg växte upp. Ove Kjellberg är finmekaniker och jag har aldrig sett honom åka i något annat än SAAB, kommer ihåg att han hade en Monte Carlo som vi klämde in oss i för en tripp till någon tävling söderut, NM i Danmark vill jag minnas. Under ett lunch-



stopp vägrade V4'n att starta. Förgasaren satt i mitten mellan cylindrarna och värmen som bildades under huven när motorrummet inte ventilerades av kyl Luft fick till följd att det bildades ångblåsor i bränslesystemet.

Under ett antal år var det tillåtet med monoline vilket markant ökade farten. Alltså en lite tjockare lina som vreds runt i stället för systemet med två linor som förflyttar sig parallellt mot varandra. Ove hängde först på och finmekaniker som han är tillverkade han först en variant som såg ut som en cykelpump. Sedan byggde han istället en variant av det traditionella handtaget men försedd med växeldrev.



När jag fyllde 10 år fick jag en oväntad present. En silverglänsande kula dök regelbundet upp på himlen och under ett antal minuter stod folk andäktigt och tittade medan silverkulan sakta färdades mot horisonten och försvann. Skådespelet höll i sig ett par månader och det var Sputnik vi tittade på. Tidtabellen stod i tidningen för jag tror faktiskt inte ens att vi hade TV 1957. Det fick vi först året efter i samband med fotbolls-VM. Den införskaffades på en tisdag viken var den mest korkade dag att inhandla en TV på man kunde tänka sig. Det var ju sändningsuppehåll på onsdagar! Så innan pappa och farbror Birger hade fått upp och riktat in antennen blev vi barn kommenderade till sängs. Nästa dag stod

den där Graetz-apparaten blank och fin men alldeles död. Eller rättare sagt myrornas krig kunde den åstadkomma, men ingen Andy Pandy i rutan. Den dagen kändes längre än julafton. Köp aldrig TV på en tisdag!



Sputnik och motsvarande amerikanska rymdaktiviteter pågick under Kalla Kriget varför Sverige försåg alla barn med en ID-bricka utifall det värsta skulle inträffa. Brickan var rostfri och bl.a. försedd med personnummer och blodgrupp. Den bestod av två delar och kunde brytas av så delen med halskedjan kunde lämnas kvar på den drabbade, medan den andra halvan togs om hand för registrering.



På den tiden fanns i Barkarby en mycket aktiv flygflottilj vilket gjorde att det kontinuerligt kom grupper av Vampire, Tunnan och Hawker Hunters ovanför skorstenarna då husen låg rakt under inflygningsvarvet. När de passerade var det ingen mening att försöka säga något för de kom lågt och de lät rätt bra. Efterhand lärde man sig känna igen flygplanstypen på ljudet. Enklarest var Vampire med dess visslande motor. Värst hemlig var ändå inte F8. Det hölls officiella modellflygtävlingar på plattan utanför deras



hangarer. Fast det var lite läskigt att närma sig portarna då det sprang ilskna hundar löst innanför och med tanke på morrandet var det nog bäst att hålla avstånd.



Långt innan dess hade vi skolbarn planterat skog i närheten av Bloodhound-luftvärnsrobotarna vilka märkligt nog stod vända mot öster utom några få som symboliskt nog var riktade åt annat håll. På F8 stod också två "Blyertspennor" eller Canberra som de egentligen hette. De stod uppställda för sig själva längs vägen mot Sollentuna mitt emot befästa berget och såg inte värst mycket ut för världen tills jag för ett tag sen besökte Flygvapenmuseet i Linköping. Där fanns en av dem och jisses vad stor den var när man kom inpå, men jag kan inte minnas att jag såg någon av dem i luften. Ibland kom J35 på besök. Draken alltså. En gång steg en sån rakt upp med en stor eldkvast efter sig och försvann bland molnen. Någon minut senare svischade en skugga förbi några 10-tals meter ovanför startbanan och lämnade ett himla brak efter sig. Mycket imponerande. Kraften och trycket i bröstkorgen bidrog säkert till flygintresset.



Eller också uppkom det redan när pappa tillverkade egna Jetexmotorer modell kraftigare som han flög med på Golfängarna vid Lötsjön. Det slutade många gånger med att flygplanet hunnit brinna upp innan farsan hann fram för att rädda det som kunde tas tillvara. Men också för att han släpade med mig till Östermalms Idrottsplats när det var dags för Modellsportens dag. Årets höjdar-tillställning!

Vem kunde tro att SAAB under tidigt 50-tal tog fram en jetmotor som fick namnet Cyclon! I alla fall om man ska tro den amerikanske pulsjetsamlaren R E Nichol i Colorado Springs, USA. I hans texter kan man läsa om "SAAB Sweden prototype experimental jet 1951" och "SAAB Sweden production Cyclon 1952". Men det visade sig inte vara helt korrekt uppfattat. I Linköping fanns efter kriget ett gäng LEN-flygare som bildat

en klubb vid namn Cyclon vilka tillverkade och framgångsrikt flög egna pulsjetmotorer som konstruerats av Karl-Axel Jansson. De provflög många gånger på öppna ytor inom stadens hank och stör, vilket väckte både intresse och irritation. Så pass att polisen ibland tillkallades för av avstyra tilltaget. En av reamotorerna blev så populär att den började serietillverkas som just "Cyclon".

Klubbens aktiviteter finns bland annat omskrivna i tidningen Hobbyfolk där Karl-Axel delar med sig av de erfarenheter klubben fått. Karl-Axel Janssons Cyclon hade en längd på 525 mm, en diameter på 55 mm samt en vikt på 500 gram. Dragkraften var 2 kg och den förbrukade 1 dl bensen per minut. Ville man bli ägare av en dylik tingest fick man punga ut med 110:-. Uppmätt fart enligt artikeln är 270 km/tim vilket låter lite väl optimistiskt. Mer rimligt borde 170 km/tim vara. Kopplingen till SAAB kom sig av att Karl-Axel var anställd av SAAB och framkastade idén om att använda modeller som testbänkar. Se artikel i Lina i Lina 2-2020. Vem/vilka som stod för produktionen av Cyclon är höljt i dunkel. Kanske var det SAAB trots allt?



Det var inte bara i Linköping det flögs med Pulsjet. Två dalmasar från Rättvik, Olle Lekare och Tage Nissvik, flög så framgångsrikt med reaflyg att de medverkade under Modellsportens Dag på Östermalms Idrottsplats 1947. Den uppvisningen skildrades av Teknik-för-Alla och SvD på detta vis: "Hesa Fredrik ställdes i skuggan och bortåt 4000 personer intog skyddsställning då 'Flygande Vingen' på söndagseftermiddagen slog två svenska rekord på Östermalms IP". Frågan är dock om inte det oväsen som den av Ture Nissvik konstruerade deltavingen utvecklade imponerade mer än hastigheten?

I samband med dessa uppvisningar ifrågasattes om nån någonsin skulle kunna göra ett friflygande reaplan? Som svar på det stod det i Hobbyfolk att läsa om Olle Lekare och Tage Nissviks friflygande jetmodell som endast flygs vintertid på isbelagda sjöar då den behöver stora och fria ytor. Kärran stiger i ungefär 35° vinkel och flyger sedan runt på 50 meters höjd. Även nattliga flygningar med eldflamman lysande som ett streck har utförts med god behållning.



Tillbaka till mammas gata. Tror faktiskt att bilbanan som låg uppe på berget vid Bromma flygplats bidrog till motorintresset. Vid stilla väder hördes linbilana ända upp till Vegagatan där vi bodde och rackarns vad det gick undan. Farsan byggde en 4-taktsmotor bara för att se om det gick? Förutom den hade han en ED Racer 2,5 cm³ dieselmotor till vilken han tillverkade en campingbåt i mahogny som troligen försvann i någon flytt.

Kommer inte ihåg den exakta starten för mitt modellflygande, men det fanns en grabb i omgivningarna, Lången, några år äldre än vi andra, som startade en modellflygklubb vilken han döpte efter Garofalis Super Tigremotorer varför klubben fick heta MFK Tigre. Klubben hade ingen logga, utan vi använde Tigerdekalen som följde med i kartongen vid varje motorköp. Kommer fortfarande ihåg hur det luktade inne på Hobbytjänst vilken var vår favoritbutik. Wentzels låg inte många kvarter bort, men där handlade vi aldrig. Fel sortiment eller kanske för dyrt? Minnet sviker.

Olle Andersson är en gammal klasskamrat sen småskolan, som på den tiden inrymdes i Skälby Gärd med annex. Olle Andersson byggde maskiner för Speedklasserna. Som t.ex. en C-Speed framdriven av en Dooling 61. Olle lämnade så småningom modellflygandet då han och Bo Karlsson istället började bygga dragsters. Likaså tröttnade Danne (= undertecknad) på det eviga tävlan-



det och saknade charmen av att få damma av en gammal Geting en fin kväll och försöka knacka igång dess Webra 1,5 cm³ diesel. Eller få känna lukten av 80/20 metanol och ricinolja när den en ljummen kväll lägger sig som en dimma sig över nejden. Den enda som blev kvar vid sin läst var Ulf Larsson som blev så framgångsrik i T/R-int att han och Göran Rylin sopade hem SM-bucklan alla åren utom ett mellan 1971 t.o.m. 1979.



Lången, som jag tyvärr glömt vad han egentligen hette, byggde en 5 cm³ T/R-maskin med en mycket speciell motor, en Fox 29R där "R" står för "Race". Två glödstift och intaget påminner om ett badkar. Har inget minne av hur den funkade annat än att vi experimenterade med soppa- ingredienser som idag är totalförbjudna. Bland annat nitrobensen som tränger genom huden och är vådligt cancerframkallande, men som vi använde för att vi skulle få några extra varv innan modellen måste tankas om. Åtminstone hoppades vi det. Avgaserna luktade mycket speciellt kommer jag ihåg. Normalt handlade vi på Kebo men allt vi testade med gick också att köpa på apoteket utan att någon frågade trots att man inte var myndig.



På Fox 29R är förgasarhålet så stort det bara går innan portningen sätter stopp för hur många grader hålet kan vara, så man har i stället förlängt intaget så att det liknar ett badkar. Det funkar förstås inte annat än att köra fort med, så i T/R skippas man tvåstiftstoppen och placerar en mer normal förgasare över badkaret för att motorn ska kunna suga in sig bränsleblandningen. Under vevaxeln sitter ett uttag för att få ut vevhuskompression till bränsletanken. Ett öppet badkar har inte en chans att själv suga fram bräns-

let. Det måste sprutas in med övertryck. I original finns inget bränslerör tvärs igenom förgasarsalsen vilket skulle hindra luftflödet. Där sitter enbart ett munstycke. Bränslenålen är placerad på baklocket. Om det skulle gå undan tankade man med Fox egen racing-soppa HI NITRO som höll våldsamma 65% nitrometan!



I och med Långens militärtjänst tynade MFK Tigre bort och de aktiva medlemmarna anslöt sig till Solna MSK. I princip Olle Andersson (Skälby), Ulf Larsson (Kallhäll) och Dan Johansson (Barkarby). Vilka, efter att ha insett sig vara chanslösa i Combat mot Peter Evers och de andra mästerflygarna, lämnade Combat-verksamheten och tog i stället framgångsrikt upp T/R-tävlandet. Både i int- och B-klasserna och vi höll oss till just Super Tigre-motorerna.

Av erfarenhet lärde man sig att tjugiga detaljer som spinner och träpropeller inte funkade i tävling. Propellern skulle vara av hållbar nylon fastsatt med en simpel mutter med fastlåst bricka så ett eventuellt byte gick fort. Alltid en fast nyckel, reservmutter, bricka och propeller i bröstfickan. Glödstift hann man aldrig byta under ett heat. Så långt före medtävlarna var man aldrig. Det enda man kunde hoppas på i det läget var att någon av de andra fick kasta in handduken och att tiden trots allt skulle räcka till en finalplats. Motor, tank och det övriga mekaniska satt i en s.k. "panna" vilken gick att få tillverkad av Silumin i ett gammeldags gjuteri på Solnavägen om man kom med en matris att forma efter. Så hade modellen av någon anledning blivit flygoduglig var det bara att lossa ett par skruv så satt motorn i reservkärran. Gjöt man ingen panna gick det lika bra med en aluminiumram.

I T/R-B gäller Le Mansstart. Tre modeller flyger samtidigt och B-reglementet tillåter två mekaniker. En för motorn och en för glöden,



vilka måste starta racet genom att springa ut från pilotcirkeln och få liv i motorn. Soppan räckte inte alla varv så omtankning skulle förstås ske snabbt. Ofta genom en trycksatt behållare. Tanken rymde 30 ccm³. Helst skulle ett slag på propellern räcka och sen iväg utan att vara i vägen för de andra tävlande. Någon av de andra kärrorna kunde ju vara på väg ner att landa för omtankning precis när man släpper sin egen.

De flesta tävlande hade nog testat ut bränsleblandning, propellerval, värmetalet på glödstiftet, plus trimmat motorn så om man exempelvis skulle tillryggalägga 100 varv (eller 80 varv med 19 meters linlängd), men om det enbart blev 45 varv/tank, var det en bättre strategi att trimma så motorn gav mer effekt så modellen flög fortare tills dess att bränslet räckte 35 varv. Det hade många gånger till följd att alla tre modellerna kom ner för omtankning i stort sett samtidigt. Så det gällde för mekanikern att trycka ner innervingen och för piloten ha handtaget i backen med linorna sträckta så att en landande modell kunde rulla över linorna utan att trassla in sig. Varianten var förstås att snåla in bränslet så man klarade 50 varv. Men då blev motorn oftast så het att den vägrade starta om. Gav man en smutt genom avgasporten fräste det bara till och de explosiva ingredienserna i bränslet ångade bort direkt. Kvar blev bara oljan. I en alkoholdriven motor står bränslet för den största bortforslingen av värmen som bildas inne i motorn. Hellre då en säker motorstart på bekostnad av en extra omtankning. Med tiden utvecklades bränsleavstängare så piloten kunde bestämma var på varvet han klippte motorn. Hade man otur stannade motorn ett fjärdedels varv före mekanikern. Farten var då alldeles för hög för att kunna landa utan studs, så det blev till att glidflyga de 120 metrarna ett varv bestod av. Det gällde för piloten att smeka banan och sen hålla kvar modellen mot backen genom fullt dykroder så mekanikern kunde fånga vingen och tanka om medan mekaniker 2 skötte glöden.

Flygcirkeln är indelad i sektorer och missade mekanikern att fånga modellen fick han springa och hämta den och sen ta sig tillbaka till föregående sektion innan motorn fick startas. En av anledningarna till att man sällan såg mekaniker i träskor, dock med vissa undantag. De flesta hade hörselskydd eller bomullstussar i öronen då det var fritt utblås. Till och med Kjell Rosenlund erkände en gång att ljudet var imponerande när tre jämnbördiga B-Teamkärror svepte förbi varv efter varv ovanför varann i 180 km/h. För att inte tala om hur piloterna såg ut efter att under 7 minuter stappat runt varandra och försökt hålla handtaget intill kroppen med en vrålande klump i andra änden av linorna. Längst bort vid Byleden (mellan Skälby och Barkarby) hade några kringboende klippt upp en liten fotbollsplan. Där höll vi hus och aldrig klagade nån på att vi störde. Våra motorer hade inte dämpare. Det var

fritt blåst ut, så vi väsnades nog ganska ordentligt. Med tiden kom vi i moppeåldern vilket gjorde att vi t.ex. kunde ta oss ända till Bromma, kvittera ut nyckeln till grinden för att komma till startbanan som var modellflygarnas tillhåll. Flygplanen, vilka oftast var egenpåkittade combat-maskiner hängde på ryggen och paketväskorna fick härbärgera det som behövdes i övrigt.



Under min aktiva period mötte jag många modellflygare och jag kan inte nämna alla. Men som slutkläm på denna läsestud kommer historier om några av dem.



Vi börjar med Bo Karlsson, Spånga. Bo var billackerare och bodde hemma hos sina något udda föräldrar i ett ruckel till hus i närheten av där järnvägsbron från Tensta har sitt fäste. Bäst kan man väl beskriva pappan som en mustig lumpsamlare. Bosse byggde från ritning och hans modeller var alltid i den större skalan. Värst blev en Convair B-36 "Peacemaker" med sex McCoy 35-motorer. Vingarna var inte löstagbara så det införskaffades en jänkarbil typ den som syns nedan för att kunna transportera modellen. Om man la kroppen tvärs ovanpå baklysen med lite skumgummi emellan och halva vingen i bagageutrymmet stack stjärten precis ut på andra sidan. En person fick sitta inne och att se till så den andra halvan av vingen inte tog i backen. Ekipaget väckte uppmärksamhet redan på den tiden.

Antagligen för att ljudet är så maffigt köpte Bosse en DynaJet pulsjet och byggde ihop en V1-bomb från mätningar av den V1:a som



fanns på Tekniska Muséet vid den tiden. Var den håller hus idag har jag ingen aning om. Hursomhelst tittade personalen mycket misstänksamt på oss när vi gick runt och tog alla måtten. Bosse lyckades sen få vingarnas storlek, profil och position i hyfsad överensstämmelse med originalet vilket man ofta får ge avkall på om man tänkt sig få till en flygande modell.



Kommer inte ihåg mycket från själva flygningarna, om vi ens lyckades få den att låta, annat än att det var svårt att hålla modellen kvar i startvagnen. Förstås morrades det lite bland husägarna runt Skälby idrottsplats när vi höll till där, men det fanns ett högt staket runt grusplanen så det kändes tryggt ifall något skulle hända vilket det allt som oftast också gjorde. Men folk var inte så kitsliga på den tiden. Mest intresserade faktiskt. Ljudet påminner om en stor blåslampa drog alltid till sig åskådare för vi hördes ju på långt håll. Janne Svensson från Solna var finmekaniker



på Karolinska Institutet och byggde också stort. Det jag mest kommer ihåg är hans Boeing B24 "Liberator" som han uppvisningsflög med titt och tätt. Bland annat var han huvudnumret på Modellsportens Dag på Östermalms IP 1961 dit pappa tagit mig trots att jag knappt var mer än en tonåring, samt under Barkarby Skaladagar som på den tiden enbart kallades Flygdagarna där den beskrevs som en linstyrd B-17 "Flygande fästning" försedd med 4 st 10 cm³ motorer. Spännvidd 2750 mm, vikt 15 kg, linlängd 20 m. Fast jag har för mig att det nog var en B24 Liberator.

Vara som det vill med det, modellen var så tung och drog så mycket i linorna att han var tvungen att hålla i handtaget med bägge händerna för att fingrarna inte skulle räta ut sig. Helst också ha ett ankare vilket oftast var Bosse Karlsson som höll ett stadigt tag i Jannes bälte. Att hålla Janne om magen var mindre tillrådligt då han var något korpulent och aviatörerna skulle troligen trassla in fötterna och ramla ikull.



Hans Svedling var ledstjärnan inom T/R. Åtminstone i B-klassen. Även om det inte alltid gick på räls. Det var Hasse som med sin Vostok lanserade framåtsvepta vingar vilka de flesta tog efter. Av vilken anledning just den vingformen skulle vara att föredra vet jag faktiskt inte. Oavsett vilket flög Hasse alltid ihop med Anders Eklund.

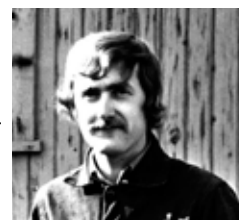


Rolf Hagel, den skånske motortrollkarlen som flög medurs, hade sin egentliga gärning i friflyget där det gällde att motorn presterade max under de få sekunder den tilläts gå. Kunskaperna hur man trimmar motorer tog han till linstyrd speed. Det var inte ofta man såg Rolf på Bromma då tävlingarna i de olika grenarna kolliderade. Men när han dök upp flög han som jag minns det skjortan av medtävlarna. Kommer ihåg en gång när hans tävlingsmotor havererat. Han tog fram reserven och ställde in den lite rikt. När motorn gått ett tag stack han skruvmejseln i propellern och motorn rusade upp i vansinnes-varv utan kylning. Efter en stund nöp Rolf bränsleslangen och kände på motorn. Den fick godkänt och stoppades i modellen. På frågan om det var tillrådligt att köra in motorn på det viset svarade Rolf: "Givetvis inte, men vill man vinna får man offra". Rolf hade den vassaste ST:n under VM i Budapest 1964

Naturligtvis finns det mer minnen och av någon konstig anledning dyker det ständigt upp nya när man tänker på andra. Så det finns en outsinlig källa till material som bara ska skrivas ned och dokumenteras. Men det är en annan historia. Med förhoppning om att Ni haft trevligt genom att läsa mina minnen tackar jag för denna gång.

/Danne Johansson

I yngre upplaga >>>



Kungsbacka MFK bjöd åter på en mycket trevlig tävling arrangerad av Michael Palm. Tävlingsvädret var i det närmaste perfekt – svag vind och molnen på himlen gjorde att vi slapp solen i ögonen när vi flög.

Det var glädjande att se så många deltagare i Semistunt! Det var många år sedan det hände senast. Det var tyvärr lite glesare i F2B där endast sex deltagare kom till start. Våra stuntvänner i Finland, Norge och Danmark valde alla tyvärr att stanna hemma i år. De ovanligt höga drivmedelspriserna har säkert varit en faktor i beslutet att inte resa till Kungsbacka då många har lång resväg.

Störst klass med nio deltagare var som vanligt Weatherman Vintage Speed och det

är en klass som blivit mycket populär på bara några få år.

De flesta deltagarna kom i god tid innan genomgången och hann att provflyga innan tävlingen drog igång. Michael hade förbättrat tävlingen på ett föredömligt sätt med fina avgränsningar till lingårdarna och ett imponerande välklippt gräsfält. Som vanligt bjöd Kungsbacka MFK alla deltagare på kaffe och smörgåsar uppe i klubbhuset. De olika klasserna varvades under dagen och tävlingen flöt på bra för alla inblandade.

Michael flög sin egendesignade Holy Diver och Emil med SV-II. Båda kärorna är mycket välflygande men p g a krånglande bränslematning blev resultatet tyvärr sämre än vanligt. För min egen del hade jag valt att flyga min nya Thunder Gazer. Det gick skapligt med tanke på att den fortfarande

är i trimmstadiet. Lennart Nord var stabil som vanligt trots att han tvingades flyga utan sporrhjul. Anders Hellsén flög en nyinskaffad Trivial Pursuit försedd med en pipförsedd Enya 6r. Ett stort lyft jämfört med de modeller Anders flög på VM enligt honom själv. Staffan använde sin nylagade Ball Breaker och som vanligt sitter det en OS46 VF med pipa i nosen. Staffan var i topp efter de tre omgångarna men inte med samma stora marginal som förr. Anders var den som var närmast Staffan, endast 16 poäng efter och med oss övriga hyfsat tätt därefter. På så vis blev det en ovanligt oviss och spännande tävling.

Semistuntarna flög riktigt bra och jag kan tänka mig att både Stefan och Thomas väldigt snart flyger F2B med tanke på deras imponerande utvecklingskurva.

I Weathermantävlingen utklassade Lennart de andra genom att sätta ett präktigt rekord med sin dieselkonverterade Zorro.

För min del kändes det som allt var över alldeles för snabbt och det var inte utan att jag kände en önskan att det borde ha varit en tvådagars tävling så att det roliga hade kunnat fortsätta. Stort tack till domarna Johan, Kauko och Conny samt Ingvar i sekretariatet som gjorde det möjligt för oss andra att uppleva en superkul tävling.

Niklas Löfroth



Isabell Dyplin, MFK Snobben flög den här fina kärnan – ARF Oriental från Brodak med en Brodak 40 i nosen.

55:e upplagan av –

VÄSTKUSTTRÄFFEN





Alf Eskilsson och Lars Roos var endast med som publik den här gången men jag vet att Lars önskade att han hade tagit med sig modellen.



Stefan Olssons fina Weatherman-modeller som går fort dessutom.



Michael Palms Holy Diver och Emil Palms SV-11 i bakgrunden.



Anders Hellsén hade bra häng på Staffan i toppen men fick till slut se sig slagen med ynka 16 poäng.



Thomas Olsson tävlade i Semistuntklassen med en väldigt fin Vector.



Staffan Ekström kunde återigen knipa segern i F2B men konkurrenterna var betydligt närmare i år vilket gav en spännande tävling.

RESULTAT 55:E UPPLAGAN AV VÄSTKUSTTRÄFFEN Inlag, Kungälv, 10 september 2022

Tävlingsledare: Michael Palm. Sekretariat: Ingvar Nilsson
Stuntdomare: Johan Larsson, Kauko Kainulainen och Conny Åquist

F2B Stunt

Plac.	Namn	Klubb	Omg 1	Omg 2	Omg 3	2 bästa
1.	Staffan Ekström	Trelleborgs MFK	962	978	998	1976
2.	Anders Hellsén	MFK Snobben	954	984	976	1960
3.	Lennart Nord	Västerås FK MF	917	970	967	1937
4.	Niklas Löfroth	Karlskoga MFK	735	962	952	1914
5.	Michael Palm	Kungälv MFK	783	954	871	1825
6.	Emil Palm	Kungälv MFK	102	787	728	1515

Semistunt

Plac.	Namn	Klubb	Omg 1	Omg 2	Omg 3	2 bästa
1.	Stefan Olsson	Uddevalla RFK	529	521	514	1050
2.	Thomas Olsson	Trollhättans MFK	416	519	515	1034
3.	Ingemar Larsson	Vänersborg MFK	428	424	473	901
4.	Isabell Dyplin	MFK Snobben	197	199	191	396
5.	Perra Dyplin	MFK Snobben	127	142	150	292
6.	Torbjörn Lundgren	MFK Snobben	109	136	128	264

Weatherman Vintage Speed

Plac.	Namn	Klubb	Klass-Tid-Hastighet-%	Motor
1.	Lennart Nord	Västerås FK MF	2.5D / 17,8 s / 162,7 km/h / 110,1 %	Zorro (konv)
2.	Thomas Olsson	Trollhättans MFK	1.5D / 22,3 s / 129,8 km/h / 93,7 %	THK
3.	Martin Larsson	MFK Sländan	2.5D / 21,1 s / 137,2 km/h / 92,9 %	Fora
4.	Stefan Olsson	Uddevalla RFK	1.5G / 21,3 s / 135,9 km/h / 91,1 %	Parra
5.	Ingemar Larsson	Vänersborgs MFK	2.5G / 19,2 s / 150,8 km/h / 90,1 %	Furia
6.	Johan Larsson	Vänersborgs MFK	1.5G / 22,3 s / 129,8 km/h / 87,0 %	THK
7.	Hannes Illipe	Kungälv MFK	Mills / 19,9 s / 72,8 km/h / 86,4 %	Mills
8.	Conny Åquist	Uddevalla RFK	2.5G / 23,3 s / 124,3 km/h / 74,2 %	K&B
9.	Torbjörn Lundgren	MFK Snobben	2.5G / 27,1 s / 106,9 km/h / 63,8 %	AP15

Vänernspokalen



Stefan och Lennart.



Om man bara ser till att Karlsköga-flygarna får kontinuerlig tillgång till Bullens Pilsnerkorv håller de sig på gott humör.



Semifinalen i Slow Combat mot Ingemar slutade med en kluven modell och disk för Per.



Clement i domartagen.



RM i Armkrok mellan Lennart och Johan.

Efter två års uppehåll på grund av pandemin var Vänernspokalen efterlängtd av många. Och när anmälningarna summerats visade det sig att vi fått fler anmälda än på många år, bland annat då både Stefan Olsson och Thomas Olsson tagit upp combat på sitt schema. Kompani Norge anslöt också genom Per och Clement! Faktum är att jag inte kommer ihåg när vi hade piloter från 8 klubbar med i tävlingen senast. Redan vid lunch på fredagen startades med både träning, testning och Weatherman-flygande och allteftersom eftermiddagen övergick i kväll dök alla deltagare upp.

Lördagen började tyvärr med regn men framåt lunch kunde vi starta med 1.5-combat. Som vanligt i 1.5 ser man inte så många klipp utan det ligger på 0-2 i varje heat. Dock finns undantag! När Niklas och Clement möttes i första omgången vann Niklas med 4-0 (och full tid). 4 klipp blev det också i omgång 2 när Niklas mötte Lennart men fördelningen blev nu 2-2 men Lennart vann med full tid. Sedan tuffade det på tills bara Johan och Lennart var kvar och då båda var utan förlust (och tycker om att flyga) krävdes det tre finalheat innan Lennart stod som segrare och ny Riksmästare. Först vann Lennart med 2-1, sedan vann Johan med mer flygtid i ett heat med 1-1 i klipp. Och till sist dräpte Lennart till med en vinst efter 3-0 i klipp. Men Johan fick också ett förstapris då tävlingen även var DM för Västra Götaland.

Lördag kväll och Clements franska matlagning var också efterlängtd! Och när Clement i år lovade att inte blanda sniglar i maten sken Lennart upp i ett leende. Nu blev det en rätt med nudlar/pasta, skinka samt ädelostsås och vi alla åt tills det inte gick ner mer. Han är duktig på matlagning vår norsk-franske linflygare och det är kul att få äta sig igenom det franska köket. Man undrar redan vad som bjuds nästa år.....

Söndagen bjöd på uppehållsväder och Slow Combat plus Weatherman för de som inte gjort sina tre försök. Samma piloter som flög 1.5 på lördagen flög på söndagen. I omgång 1 verkade alla lite blyga för att klippa då ingen tog mer än 1 klipp men i omgång 2 vaknade Niklas och tog 3 klipp på Clement medan Ingemar tog 2 klipp på Micke vilket också Lennart tog på Stefan. I omgång 3 följde Niklas upp med ytterligare 3 klipp på Thomas medan Kent och Lennart nöjde sig med 2 klipp mot Johan respektive Ingemar. Sedan var det inga mer heat med 2 klipp eller mer och i finalen mellan Lennart och Ingemar blev 1-1 men 9 sekunder mer flygtid för yours truly. Tror det var 10 år sedan jag vann ett RM i Slow senast och det ju kul att göra det igen. En fly-off gjorde att Per blev 2:a i Vbg-pokalen men i RM slutade Lennart tvåa och Niklas trea.

I Weatherman var det en kamp mellan 1.5-dieslar 4 st) medan 1.5-glödarna låg en bit bakom. Lennart vann även här och blev helgens kung med två vinster (3 med Webra Rekord Cup!) och en andra-plats.

/Ingemar

RM i Slow Combat och Combat 1.5

Vbg-pokalen/Riksmästerskap Combat 1.5

Placering, Namn, Klubb	1	2	3	4	5	6	7
1. Lennart Nord	V 2	V 7	V 11	V 15	V 17	F 18	V 20
Västerås FK Modell	(560)	(680)	(368)	(288)	(612)	(486)	(592)
2. Johan Larsson	V 1	V 6	V 12	V 16	F 17	V 18	F 20
Vänersborgs MFK	(454)	(518)	(520)	(572)	(424)	(554)	(480)
3. Niklas Karlsson	V 5	F 7	V 13	V 14	F 16		
Karlskoga MFK	(840)	(568)	(412)	(436)	(452)		
4. Stefan Olsson	V 4	V 8	F 12	F 15			
Uddevalla RFK	(392)	(372)	(480)	(220)			
5. Kent Hedberg	F 1	V 9	F 11				
Karlskoga MFK	(110)	(456)	(160)				
Thomas Olsson	F 4	V 10	F 13				
Trollhättans MFK	(276)	(-)	(198)				
Per Vassbotn	V 3	F 6	F 14				
Agder MFK, Norge	(580)	(466)	(190)				
8. Clement Bindel	F 5	F 10					
CMBL, Frankrike	(374)	(Disk)					
Ingemar Larsson	F 2	F 8					
Vänersborgs MFK	(260)	(234)					
Michael Palm	F 3	F 9					
Kungsbacka MFK	(486)	(400)					

Vbg-pokalen/Riksmästerskap Slow Combat

Placering, Namn, Klubb	1	2	3	4	5	6	7
1. Ingemar Larsson	V 3	V 9	F 11	V 14	V 18	V 19	
Vänersborgs MFK	(580)	(680)	(232)	(396)	(-)	(402)	
2/- Per Vassbotn	V 5	V 10	F 14	V 16	V 17	F 18	(V)
Agder MFK, Norge	(557)	(-)	(270)	(404)	(208)	(Disk)	(-)
3/2. Lennart Nord	V 4	V 6	V 11	V 15	F 17	F 19	(F)
Västerås FK Modell	(284)	(680)	(608)	(580)	(142)	(384)	(wo)
4/3. Niklas Karlsson	F 5	V 7	V 12	F 15	(V)		
Karlskoga MFK	(318)	(674)	(620)	(178)	(362)		
4. Kent Hedberg	V 1	F 8	V 13	F 16	(F)		
Karlskoga MFK	(468)	(426)	(664)	(132)	(250)		
6. Johan Larsson	V 2	F 10	F 13				
Vänersborgs MFK	(-)	(Disk)	(250)				
Thomas Olsson	F 3	V 8	F 12				
Trollhättans MFK	(104)	(480)	(480)				
8. Clement Bindel	F 4	F 7					
CMBL, Frankrike	(72)	(366)					
Stefan Olsson	F 1	F 6					
Uddevalla RFK	(92)	(482)					
Michael Palm	F 2	F 9					
Kungsbacka MFK	(Disk)	(150)					

Weatherman Vintage Speed

Plac., Namn, Klubb	Klass	Tid	Hastighet	%	Motor
1. Lennart Nord	1.5D	21,0 s	137,9 km/h	99,5 %	Fora
Västerås FK Modell					
2. Ingemar Larsson	1.5D	21,6 s	134,1 km/h	96,8 %	THK
Vänersborgs MFK					
3. Thomas Olsson	1.5D	22,3 s	129,8 km/h	93,7 %	THK
Trollhättans MFK					
4. Stefan Olsson	1.5G	22,2 s	130,4 km/h	87,4 %	Parra
Uddevalla RFK					
5. Johan Larsson	1.5G	23,8 s	121,7 km/h	81,5 %	THK
Vänersborgs MFK					
6. Conny Åquist	2.5G	21,3 s	135,9 km/h	81,2 %	Nelson
Uddevalla RFK					
7. Per Vassbotn	1.5D	28,3 s	102,3 km/h	73,9 %	Fora
Agder MFK Norge					

Webra Rekord Cup

Plac., Namn, Klubb	Tid
1. Lennart Nord	27,8 s
Västerås FK Modell	
2. Stefan Olsson	29,5 s
Uddevalla RFK	
3. Ingemar Larsson	31,0 s
Vänersborgs MFK	



Thomas och Stefan.



Vbg-pokalen/RM i Combat 1.5:
Johan Lennart och Niklas.



Vbg-pokalen i Slow Combat:
Per, Ingemar och Lennart.



Niklas kom 3:a i RM
i Slow Combat.

Stefan och Johan.

Fantkas

The 1968 Fantkas represents the natural evolution of a Stunt acrobatic training model, the Star, designed in 1957 and which from 63 onwards allowed first members of the Gonnosfanadiga Air Club group to gain experience in control line. Obviously, the 10 years that have passed since the design of the first ancestor have brought several improvements also due to studies in mechanical engineering, at that time now near completion. The Fantkas can rightfully be considered a true stunter and was the first model that allowed the entire FAI stunt program to be done in Sardinia. In this regard, I can assure you that it is not at all simple when, due to the lack of contact with the outside world, the only reference is made up of the Rule Book.

From 1967 and onwards she made herself known in the various fields of Sardinia and her design was made available to all Sardinian modellers; it is still our base model today and many have gone back after switching to larger models. In 1975 she also took part in a race in the Italian Championship in Novara, by Gianni Ortu, then fifteen years old. He finished not too far from the center of the result list. In the 90's the Fantkas was noticed by our friend Pino Carbini on the occasion of his "repatriation" in Sardinia and so the design also landed in Bassano del Grappa and was led to victory in two rounds of the Cisalpino Championship (category Beginners) by the young Gabriel Laghi.

In the hope of pleasing those who want to approach control line, and stunt in particular,

I will try to highlight some fundamental aspects for the construction and development of the model.

The model was designed account savings in mind as in our part Gonnese (citizen of Gonnosfanadiga) is synonymous of Scottish and a minimum of attention is required to obtain the various pieces from the balsa tablets as indicated on the plan.

Fuselage construction does not present particular difficulties. The most important thing is the perfect parallelism between engine, wing and horizontal tail planes and to facilitate that the back of the fuselage is straight and parallel to them. Gluing must be done with fast vinyl glue, more elastic than cellulosic glue, whose possible use must however be limited to balsa only, excluding in any case large surfaces, such as for example cheeks. At this stage, remember to adapt bearers distance to accommodate the engine and before gluing the cheeks to fix the four screws to fasten the engine (M3x20 mm) by interposing a flat washer between the screw head and the bearers; then lock them in pairs by welding a piece of 1 mm steel wire (or a simple pin) at the cut of the heads.

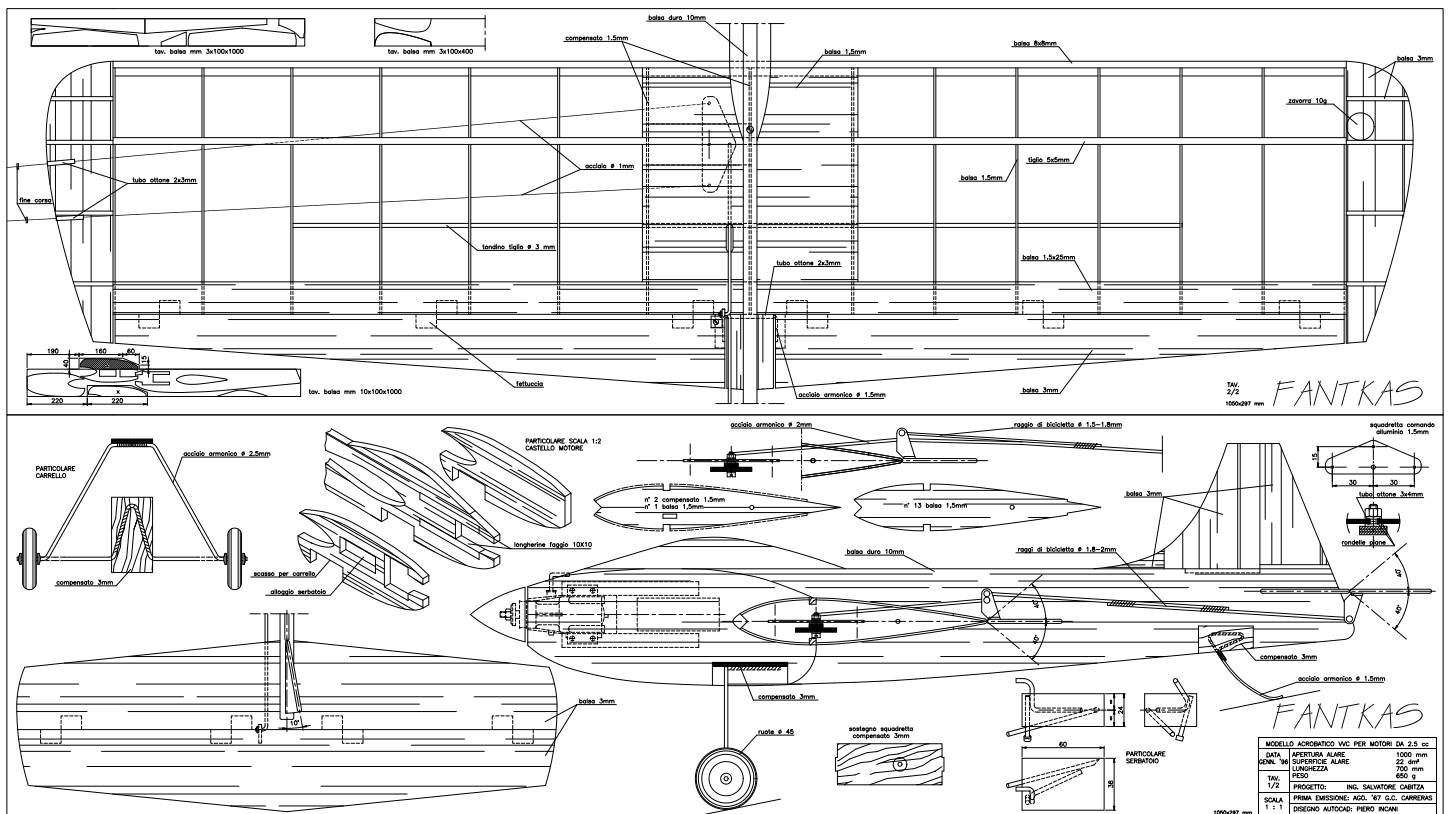
If you use a silencer (or a motor unit - muffler heavier than 150 - 170 gr) it is advisable to shorten the nose by about 1 cm to avoid having a nose heavy model. At this stage it is also advisable not to mount the balsa canopy and the fin so as to have a flat surface for the subsequent alignment of the wing and tail



Elvio Incani with Fantkas and Tore Cabitza with the Star, many "hairs" ago (around 1967/1968).

planes. On the other hand, it is possible to carry out the cut-outs for the landing gear and the tail skid; bindings must be made with cotton or thread, quite sturdy, (possibly glued with epoxy) or even in copper.

Two and a half tablets of 1.5mm balsa are required for the wing. Obtain from the hardest parts the two 1.5x25 mm strips for the trailing edge and then 14 rectangles of about 38x190 mm for the ribs "package" shaping method. Make the two plywood ribs following the extreme outline so that they can be used, at the extremes of the package, for



A small Stunter from Sardinia

shaping the ribs; only subsequently lower them by 1.5 mm, together with one in balsa, for the central part to be covered in balsa. On the plywood ribs also remember to make the joint for the bellcrank support and on the ribs of the internal half wing make the holes for the passage of control lines.

Before starting the wing assembly check that the various spars are straight enough (discard them without regret if they are to be twisted) and remember that the wing is the most important part of the model and must be free of warps. Then protect the drawing with a cellophane sheet and pin the linden strip 5x5 mm in correspondence of the position indicated on the plan. Glue the ribs onto the spars (remember to insert the bracket support on which you have already fixed a screw (M3x15 mm) and make sure that the leading and trailing edges are perfectly aligned with the help of a support stop at the rear; then add the other strips, always checking the alignments. Then assemble the bellcrank with the various links. To improve sliding and clearance, insert a brass tube bushing (\varnothing 3x4 mm, about 1.7 mm high) between the pin (3 mm screw) and the bellcrank to be locked between two flat washers, check that there are no obstacles to its movement and proceed to cover the central part of the wing.

At this point you could also mount the wing in the fuselage reserving to add terminals and flaps at a later time. Some prefer instead to complete the wing and in this case it will be necessary to widen the opening in the fuselage for the passage of the flap, which in any case must be closed with the wing fittings. In any case, when assembling the wing it is essential to carefully check both the

perpendicularity with the fuselage and above all, its alignment with the motor axis; place the back of the fuselage on a flat surface and measure, in several points, the distance from the surface both along the leading edge and along the trailing edge. Repeat the same process for the horizontal tail planes. Once this is done both the balsa canopy and the fin can be assembled. Before mounting the flaps, remove any slots and gaps present along the seam of the trailing edge (a good way to do this is to cover the entire trailing edge with light modelspan).

Then move on to the arrangement of the controls; in both proposed systems it is possible to adjust the relative position between flaps and elevator but it is necessary to be careful to make sure that the zero of the bellcrank corresponds to the zero of the mobile part controlled directly (the flaps in the first solution or the elevator in the second). Thoroughly sand the entire model with fine sandpaper and move on to the finishing operations.

Before covering, check that the wing does not have any warps. Looking at the wing from the front and rear, the leading edge and respectively, the trailing edge should be centered respect to the overall dimensions of the wing itself. Small twists can be easily corrected with a geodesic binding (with yarn or cotton thread) made between the central strips and the leading or trailing edge concerned. The wing must be covered with heavy modelspan paper by gluing it, with diluted vinyl glue, only at the edges and possibly without creases; in this phase leave out the terminals that must be covered later. When the whole wing is covered wet it with water,



Aeromodellisti di Serramanna (G.F. Battaglia and A. Incani) with the Fantkas at the Gonnosfanadiga circle (1985).

using a rag or a sprayer, and let it dry. If you have been good (or lucky) the wing should be well stretched and free of warps. Otherwise, don't worry too much: the small folds should disappear during the waterproofing phase, to be carried out with a few coats of diluted glue (with normal nitro diluent), and any twists can be corrected by holding the wing under weights during drying.

The fuselage can also be covered with (light) paper and then waterproofed with diluted glue by sanding it lightly with sandpaper between one coat and the next. Colored paint is not essential but it gives a certain charm and also covers some flaws; not too excessive. If you use a glow engine, give a good final fuel proof coat, especially in the engine and tank compartments, along the critical gluing points of the wing and tail planes and along flaps and elevator hinges edges being careful not to block hinges.

The tank can be glued to the fuselage closing all possible stagnation points or it can be elastically fixed by means of rubber bands held by a steel wire support fixed between the fuselage and the inner cheek; in this case it is also possible to interpose a layer of foam rubber between the fuselage and the tank to eliminate any vibrations. The tank normally used by us is at a constant level and the breather hose must therefore be kept closed during the flight.

The engine used in the old days was the never forgotten G 20/15, the diesel with 8x6 propeller or the glow with the 8x4. We are constantly looking for valid replacements, with good performance and "human" cost; some diffusion has had the CS 2,5 junior BB that is not anymore available. However, the various 2.5 cc available today (usually in the RC



Some members (A. Melis, A. Mallica, G.P. Melis, G. Piras and F. Tuveri) of the Gonnosfanadiga Air Club with more or less modified Fantkas (around 1967 - 1968).

A Sardinian Challenge!



version and therefore to be adapted), such as the OS 15 FP, used by Laghi, or other various orientals in general, should also be fine.

Often it takes small adjustments to get the model to fly better, especially for “rustic” pilots, like moving the CG and then: what arrives, arrives. In fact, the model is hardly born perfect, some “flaw” here or there are always present so a more or less laborious tuning is always indispensable to bring out from every “creature” all the potential it can be capable of. Some small interventions are essential to ensure that even a “jug” can, at least in part, be recovered.

The biggest problems are related to the wing warps which, despite the attentions, often remain, even if not too visible; a difference

in behavior between straight and inverted flight dramatically highlights them. The positive twist of the internal wing (and/or negative of the external one) allows the pilot to see the belly of the model, both in straight and inverted flight, while in the case of contrary twists the back is visible. If, on the other hand, when passing from straight to inverted flight, the internal wing always remains low (or high), it is only a matter of tip weight being too low (or respectively too much) and therefore to be corrected.

In the event of twisting, you can intervene by misaligning (opposite to the twisting themselves) flaps, forcing in correspondence with the 1.5 mm steel wire that joins them; in this case it may also be necessary to make a small adjustment to the flaps - elevator alignment.

If you have taken care of the construction of the nose there should be no problems with vibrations, if not, check the balance of the propeller. As far as the fuel supply to the engine is concerned, this type of tank has never given problems. Check that engine revs does not vary between straight and inverted flights at the same flight altitude, otherwise and with the utmost delicacy, lightly force the feed tube in order to translate the draft point upwards (if it leans in reverse) or down (in the opposite case).

And then we come to centering the CG. The model responds well even with a more advanced position of the center of gravity but it is advisable to keep that indicated, or even slightly further back once a certain safety has been reached. Personally I believe that the ideal position for the CG is the one corresponding to the maximum sensitivity which, however, makes the model very difficult to fly. To put things back in place (unless you are a “dragon”) it is essential to use a knob that allows you to bring the cables closer and, in this way, in addition to the tighter figures you will also be able to fly without swaying both straight and inverted.

The pitch indicated for the controls is the maximum, absolutely not to be exceeded (it can only serve to stall the model), but at least initially it is preferable not to exceed $\pm 30^\circ$. In these conditions the model is easily able to do all the round figures and also the looping at take off. Personally I have never done it but I have seen it done by several students; once I even saw two consecutive ones (obviously unwanted) and this can create some small problems for the slow helper. To adjust the pitch of the controls, it is possible to act on the limit washers welded or glued with epoxy to the leadouts.

As lines you can use 0.3-0.35 mm and length between 16 and 17 m, depending on the speed of the model; if the pull does not satisfy you, you can slightly offset the motor. Always remember to check the controls before each launch, adjust the engine slightly and try to get the model back to the ground safe and sound. In case of breakage, learn to put it back in place and you will see that the results will come.

At this point all that remains is to wish you good flights with the hope that in the future some of you, also thanks to Fantkas, can cause some little trouble to stunt aces!

Salvatore Cabitza
s.cabitza@alice.it
&
Piero Incani
ITA



Have fun flying at over 300 km/h



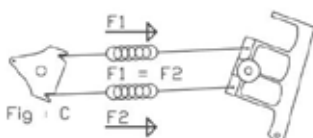
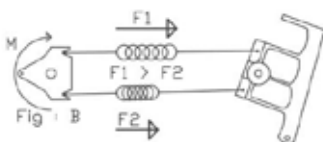
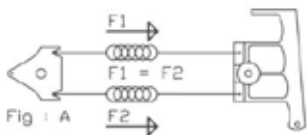
In the center of the circle, at over 300 km/h when you turn around in 1.3 seconds and try to keep the plane under control, it's sometimes difficult to choose between flying or running... fast....

The stopwatch is on, we know it, the laps pass and the plane continues to oscillate between 1 m and 2,5 m, nothing helps, it oscillates so we make sure that it will finish the 9 laps and that will be enough for today.

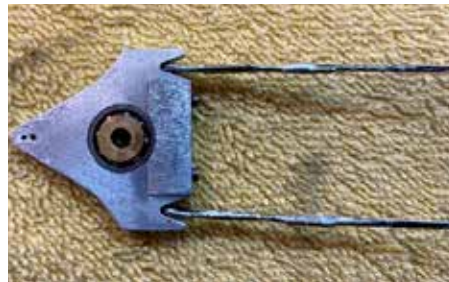
Together with Guy Ducas we have worked a lot on the flight stability of our F2G electric speed planes, the aerodynamics and flight mechanics are now sufficiently understood and mastered, however some planes oscillate during the flight and they require more piloting than others, the question is for what?

For speeds around 300 km/h in F2G we have a tangential acceleration of nearly 40 G and a traction on the lines which can reach 25 kg. This force is fully taken up by the bellcrank and an axis of more or less hard steel that we took from the F2A material.

In stabilized flight, everything is fine the forces on the lines are balanced (Fig A & C). To make a correction to the rudder, with the



friction between the axis and the bellcrank, we need to create a force between the lines to overcome this "static friction" so that the bellcrank moves in rotation. For this, the lines behave like springs and when the difference in force is sufficient, the bellcrank moves to find a new neutral position (Fig B). It's intuitive to understand that it is difficult to find the right position because due to the fact that the plane does not change trajectory until the bellcrank/elevator moves, the pilot very often amplifies the correction order beyond the necessary value (Fig D). A series of corrections and oscillations follow.



In the workshop, we were able to reproduce the effect under strong line pull, the elevator no longer moves for small variations in the position of the handle, then, if we continue to increase the correction, the elevator jumps to a new position. This is a well-known "Stick-Slip" effect. Noted an unfavorable element, the distance between the cables is low, which reduces the torque rotation of the bellcrank for the same difference in force on the cables. How to fix it?



In any case, minimize friction. Pay close attention to the lubrication of the bellcrank and axle assembly, possibly using improved oils, for example with Teflon. By keeping a simple technique, the best way to reduce this rotational friction is of course to use ball bearings. Their resistance to friction is 100 times lower than steel against steel.

This phenomenon is particularly visible in F2G because the electric motors and the propellers produce practically no vibration, contrary to the F2A where the vibrations of the motor and the propeller can be significant, according to the testimonies that we were able to get on the fields. We believe that in F2A these vibrations cause micro displacements and promote sliding between the axle and the bellcrank, therefore this phenomenon is probably not visible or not significant.



For these reasons, in 2022 we tested in competition 4 planes equipped with bellcrank with ball bearings, the observation is immediate, the planes are perfectly stable and controllable even at 300 km/h. A real pleasure to pilot and fly. Now, all you have to do is run and fast... When choosing the bearing, it is essential to respect the allowable radial and dynamic loads. Some areas to study is "Stick-slip effect", variation of static friction and SKF documentation.

Daniel Rota
&
Guy Ducas
SUI



The KR Governor Story

I first saw competitive electric powered stunt models at the 2006 World Champs in Spain. There were four entries and notably one of them was top class USA pilot Bob Hunt, so it was with keen interest that I watched these pilots flying their quiet, yet powerful electric models. My initial thoughts were that they were too quiet, because I personally love the sound of stunt engines, especially the older type of engines with the 2/4 break type of run. I also did not like the sound of most of the tuned pipe engines, but saw the benefit of the control method used by the pipe engines. At that time I was enjoying flying with diesel stunt engines with my modified MVVS .49 diesel which in fact also flew at basically one speed whether climbing or diving. Tuned pipe engines in my view were too complicated and also expensive.

Then after talking a lot to my good friend Igor Burger, he told me that he was experimenting with electric power. He had designed a basic timer using a small PIC processor and he gave me one to try when I went to the 2007 Euro champs to do a presentation on the problems in the F2B rules using 3-D graphics and my CL Sim that simulated a full pattern flown to the rules. I had already tried to fly one of my older stunt models with an electric motor using my R/C system to control the rpm. That did not work very well at all. The first thing that I noticed was that the motor slowed down in climbs and went faster when diving. I thought that these fancy brushless motors worked something like synchronous motors and that the ESC (Electronic Speed Controller) did this job of keeping the rpm in sync with a variable frequency. Igor and my local electronics engineer friend Henry Kurowski, explained that brushless motors actually worked very much like normal brushed DC motors and that the rotation was done by the ESC. To run at a constant rpm they need the ESC to have a governor con-

trol system. Igor recommended the Jeti Spin ESC to me which had a very good governor in it for use with the 3-D aerobatic helicopters. I bought my first Jeti Spin ESC and with Igor's timer I had the system to start on my first competition electric stunter. This was May 2008. I called it "Electron".

It seemed to fly quite well, and I had already entered in the 2008 world champs in France, so I decided to take the Electron. My wife Bokkie and I visited Uwe and Claudia Kehnen in Dusseldorf before going to France, and I flew in a local German competition while we were there. The Electron flew well and I placed third, so the system seemed to be working well. I was the South African agent for MVVS engines and they produced some brushless motors that were really well made. They were called IN/OUT runner's and were out runner motors inside a casing.



Eze 40 with MVVS IN-OUT Motor.

My system worked quite well in the World Cup competition just before the World Champs in Landres, France, so I was hoping to perform well in the World Champs. However, in my first official flight my motor and ESC burnt out during the vertical eight. Igor had another MVVS motor and Jeti ESC that I bought from him and I practised a few flights and all was well again, or so I thought! In my



A closer look at the Eze 40 with MVVS.

second official flight exactly the same thing happened and also in the vertical eight. Igor had warned me that the MVVS motor was a bit small for this model, and all of my other flights had been in much cooler weather. As soon as the weather warmed up then these motors burned their windings and took out the ESC as well.

When I got home, I bought myself another Jeti Spin ESC and started experimenting some more. Then Igor's simple timer stopped working for some reason, so Igor sent me a new one. Then my model nosed over one day and the Jeti ESC burnt out and once again, the timer stopped working. It took two weeks for post to arrive from Igor, so he advised me to buy some of the PIC processor chips plus a programmer and he sent me the hex code to load into the chips. I am an electronics technician by trade but I had never played with these processor chips. However, it was quite easy to program them with help from Igor.

I then tried a few other Chinese ESC's with governor's in them but none of them worked as well as the Jeti Spin. The 60 amp Align helicopter ESC however worked well enough and I used that with a version of Igor's basic timers to win our 2009 Nats flying my Electron with the latest MVVS 6.5/910 conventional out runner motor in it. Now, I must tell you that one of my main sources of enjoyment in C/L comes from teaching others, especially kids. Once they get interested however, then they need equipment like models and engines. Finding good C/L stunt engines at reasonable prices has always been a challenge since R/C took centre stage in aeromodelling. After many years of training beginners, I found that a .15 glow engine size model is a good small size model. The next step is a .35/.40 size model using the plain bearing .40 engines like the OS FP series and others from Magnum and the Tower Hobbies .40. I had good .15 engines from MVVS, and their .49 for the full size stunters, and then I took the Enya agency as well, which also provided a good range of nice C/L engines, like their SS-30 and .40 plain bearing engines.



The Electron F2B model.

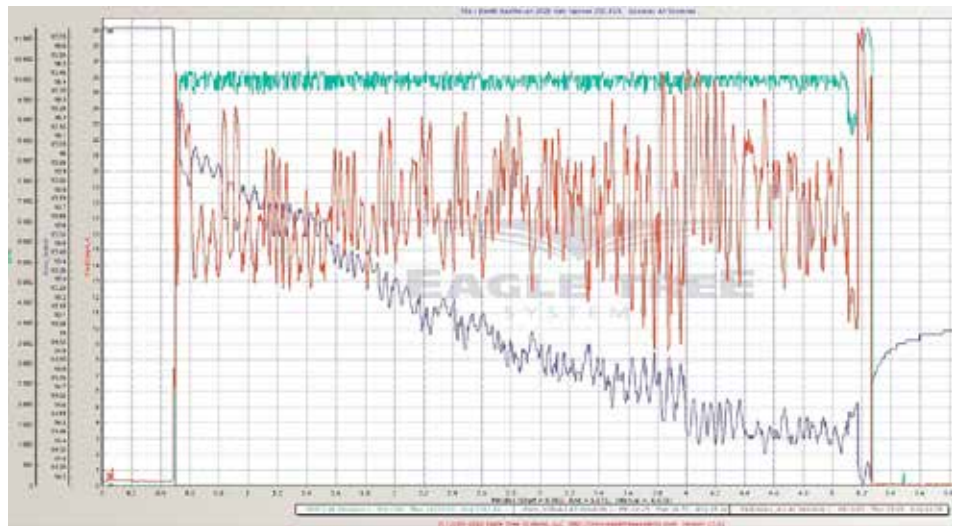
As e-power became more popular, unfortunately sales of engines dropped. MVVS stopped producing all of their glow engines and even Enya reduced production. The huge bonus of e-power was the lack of noise which opened up parks and local sports fields. The reliability of “switch on and fly” was also a huge advantage for beginners. So I then started looking at providing a good priced electric system to replace the normal sports engines that were disappearing from the manufacturers.

In mid 2009, I came up with an idea to try using the cheaper Chinese ESC's with my own external governor system. I bounced the concept off Igor and he said that it most likely would not work well and might be too slow to react if it was done externally. However, he also said that I should try it out anyway and that I would learn a lot in doing so. Being someone who usually thinks out of the box, I started to learn some PIC programming and began the project. I did know already how feedback governor systems basically work so I knew that I need to measure the rpm and then use that data in a feedback loop to keep the rpm constant. My first attempts used a hall-effect sensor to pick up the spinning magnets of the motor drum. I used the MVVS IN/OUT runner motors to do this because I could simply strap the sensor on to the outer casing of the motor with a cable tie.

Igor also encouraged me to get an Eagle Tree data recorder to record everything in flight, so that I could share data with him. After a few weeks of programming and making all kinds of prototypes, I started to get very positive results. I modified the nose on one of my well-used .40 size profile models to fit the motor and I was encouraged with good results when it sometimes felt as good (to me) as the system with the Jeti-Spin. I let a few other local pilots try this model and they were all impressed. The next step was to get rid of the hall-effect sensor because, although it worked well, it was difficult to mount on the conventional brushless motors near to the spinning drums. I eventually managed to use a single wire connected to any one of the motor wires from the ESC, by means of a low-pass filter circuit fed into one of the PIC chip inputs. This was a great improvement and I made a few pc boards by hand for others to try. I've added a photo of one of these prototype units.



KR Timer prototype.



Plot of first tests.

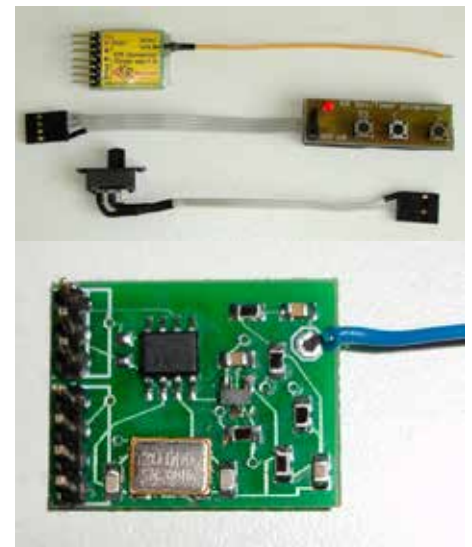
To my mind, they worked very well, so I recorded a flight on my test profile model and sent it to Igor for comment. His comment was “So why do I need to buy Jeti?” He was impressed! If you look at the data recorder chart, you can see in the green plot, you can see just how constant the rpm is held. I used my system in my Electron in October 2009 to win one of our local competitions in rough weather. The engine guys were having problems in the variable weather but my model just flew the same on each flight and I won. I was using the cheap Hobbywing ESC's without their own governor and getting excellent results. One of the features I quickly added was a program to shut down the motor if the rpm suddenly dropped like something hitting the propeller, or in a prang. I had burnt out too many ESC's before, and I know that for beginner's, burning out components can be very discouraging!

It wasn't all plain sailing however. Some days I would get very discouraged after I found issues with my system but I managed to persevere with a lot of encouragement from my fellow club members to keep going. One of my challenges was finding a simple way to program the timers for the various functions. After trying a few push buttons on my pc board, I eventually came up with the idea of using a separate 3-button programming board with a LED on it for some feedback.

In May 2010, I made the decision to lay out a decent pc board and have some boards made on the cnc machines with surface mounted parts. I had to take a panel with 60 boards on it, and I can remember that one of our club members said that this was a lot of timers for such a small sport like C/L, especially in South Africa. I must say that I was a little concerned by having to make that minimum of 60 boards, but I put a page out on my website and people started contacting me. I found a way to make them look nicer by adding a label and then covering the whole board with clear heat-shrink tubing. I sold all of them in two weeks! I started to get good

feedback on the performance and also issues that were being experienced by some pilots. I also received some good suggestions as well, so I started to modify the program to improve everything.

I sent a few timers overseas for people to try, but my breakthrough came about when Andy Borgonia in California bought a system from me and was so impressed that he mentioned it to Eric Rule from RSM Distribution who had been supplying C/L kits and accessories for some years already. Eric then wrote to me and asked me for the rights to distribute my timers in the USA. What was really nice for me was that Andy had a similar electronics background to me and offered to help Eric when small issues



KR Governor Timer v 1.

arrived. This all happened in May 2011 and I felt that my system was now sorted out well enough to offer everyone. Someone overseas told me that my prices were too low and that the competition fliers would not buy them. My reply was that there are only a handful of serious competition fliers around the world but there are thousands of sports fliers! So my target customers were in fact the sports fliers that were looking for a good alternative to the diminishing amount of good sports

glow engines. It also offered a simple and reliable way to get into flying stunt without breaking the bank!

There were some programming problems on certain makes of ESC with my version 1 timers, and with the growing popularity of my system, I was also getting requests for a retract option. I therefore decided to upgrade the system with a bigger processor to allow for the extra output. I changed the programming card and put the indicator LED onto the timer pc board. I also added the extra 3-pin connector for a retract servo, and so the KR Governor Timer version 2 was born.

Top German stunt pilot Christoph Holtermann gave me some very good feedback at this time. He said that my system flies his model very well, but in comparison to the Jeti-Spin the corners felt a bit soft as if the motor lost just a little power in the sharp corners. He stated that he wasn't sure if it was better or worse, because my system still allowed him to fly a good pattern, but it was "different". I felt that this was still positive data for my system. Then I found a way in the software to add some rpm in the hard corners, or in other words, when the system is loaded. I added feedback gain but only in one direction which was when the system is



KR Governor Timer v 2 with retracts.

loaded. Adding overall feedback gain in both directions causes bad oscillating in such systems. I tried my idea out in practice and it cured the soft corners issue and gave a nice boost to all maneuvers. I made this gain adjustable via the programming card as well so the pilots can set it to suit their own preferences.

In 2012 myself, Percy Attfield and Loren Nell, who had then emigrated to New Zealand flew my systems in the Bulgarian World Champs. Loren and I used the cheap E-Max 2826 motors with Hobbywing ESC's and standard APC 12x6-E propellers. We placed 35th and 38th respectively. I felt that this was as good or better than our previous placings with engines. Loren had previously flown tuned pipes. On one of Loren's official flights on the very bad grass circle his Thunderga-

zer model nosed over on take-off and the motor stopped immediately. He indicated to the judges that he would be ready to try again immediately and he did so. After this I sold 15 timer systems right there and then! We also had one day with really bad turbulent wind and I flew a reasonable score with no lack of power and control.

After this World Champs, I ended up with an agent in the UK and one in Brazil, which I still have today. I stated that the top competitors may not want to fly my system but quite a few have and were impressed although only a few of them have flown my systems in top level competition. This is totally understandable with Igor's incredible accelerometer system being available for high level competition.

I also did another change to the version 2 timer for use on small and profile models. The pc board is the same and I simply swung the connector pins around so that they fit over the board. I then made a small push-button on a connector socket and called it the "Compact" version. It works very well on the small 1/2A models and simplifies installation also on many profile models. I designed a very simple nose construction for profile models to suit electric systems. There



Baby Sparky.



Baby Sparky ESC closeup.



Baby Sparky Timer closeup.



KR Compact Timer & PB switch.

is no vibration (or shouldn't be!) so there is no need for such a strong nose construction like we used for engines. I typically use some 1.5 mm plywood top and bottom spaced to fit the motor as shown in the photo. Then I add 4 slots just above and below the ply strips for Velcro straps to hold the battery in place on the outside of the fuselage. These same Velcro straps also hold the ESC and timer on the inside of the fuselage.



Protron ESC closeup.



Protron Battery side closeup.

To date, I have sold around 2000 timer systems since I started, and the orders are still coming in, so I truly believe that this was a successful project. In conclusion, I would like to say thank you to the following people: Igor Burger for his continual help with my projects. Henry Kurowski for his help with the electronics and programming. Andy Borgonia for his help and support in the USA. Also in the USA to Eric Rule of RSM Distribution who was really good to work with especially when I started out. Also my thanks to Percy Attfield who has flown all of his electric models with my timer's since they first came out. I am grateful for his encouragement and good feedback. If the readers would like to contact me for any questions, then my e-mail is kreneacle@netactive.co.za.

If you want to read more about ESC, Governors and Timers have a look in Lina 2-2020.

Keith Renecele
RSA



How to build an Aeroplane!

The first requirement is to obtain permission. This requirement is vital and must be accomplished before obtaining any plans, tools or materials. How is this done? There is no single answer. You first have to sneak around that shield of suspicion, that all wives automatically bear towards their husband's activities. The old; "What is he up to now?" syndrome. Try the following ploys. Tell her that you will be home more, in fact will rarely go out. No need to point out that she will hardly ever see you, as you will be out in the shed all hours of the day and night. Hopefully, she will think that as you are home so much, those odd jobs, the garden, and the lawns will now get done.

She doesn't need to know that around at your mate's place, the lawns usually reach window sill height before being noticed as needing cutting, every tap in the house drips, and the back door is kept closed by an inclined brick. Tell her that aeroplane building widens your circle of friends, do not elaborate that these friends are mostly blokes, who disappear into your shed, to talk for hours, enthusing over strange shaped bits of metal festooned with pop rivets and 'clecos', or pieces of wood glued together seemingly at random. The few women that do arrive will join her in tea and commiseration sessions.

As you will be home so much, you won't be spending so much money on the traditional, rugby, racing and beer, she thinks that it necessarily follows that there will be more house keeping money. You need not here dilate on the exorbitant prices of aircraft quality spruce and A.N. bolts. Let her discover for herself in due time, that all hankies, most socks, trouser legs and shirt fronts will gain a patina of non-removable glue and varnish, for builders of wooden aeroplanes.

Metal aeroplane builders will tramp tiny bits of shiny aluminium from one end of the house to the other, these ubiquitous metal shreds will be entwined in socks, jerseys,

and accumulated in shirt pockets. Of course, eventually the washing machine pump will jam up with aero glue, or metal shreds, the chances of you finding time to fix the washing machine are slim, but she can bail it out with a small plastic bucket anyway. This is a laudable example of feminine kiwi ingenuity and is to be encouraged; she may discover how to replace tap washers. Hold out the promise that when you have built this wonder aeroplane you will be able to fly her to the Mother-in-Law's town any old time she wants. She really doesn't need to know that it takes years to build an aeroplane, and the old adage says, "time to spare, go by air."

Also, all holiday weekends are reserved for 'fly ins' and other absorbing aeronautical activities. From the foregoing pearls of wisdom, have you successfully accomplished step one? Next step is to decide what aeroplane to build. Will it be wood, metal, or fibreglass? How many seats, biplane, or monoplane? If a monoplane, low wing, high wing, or shoulder wing? Will it be super smooth with pointy spinner and very fast, or slower, steady and capable of taking off from, and landing in, paddocks. What about an amphibian, you could fly to the lakes for a bit of fishing. What about a helicopter? Be sure, that once you make an irrevocable decision you will discover a type that looks more attractive, and will do more, than your dream baby. Actually during this decision making process you will gain much post school education. You will become expert on currency conversion problems, U.S. dollars, Canadian dollars, Australian dollars and English Pounds to N.Z. dollars, perhaps even French francs.

Also converting speeds, volume and measurements, don't get caught out on U.S. gallons. Pity you overlooked pointing out to your little lady how aeroplane building expands knowledge. How big will this dream aeroplane be, will your existing shed, or garage, be big enough to accommodate the

building benches? Just as well you forgot to tell your little lady that while you are building your aeroplane in the garage, her car would have to exist outside. Oops, too big, you will have to build a special shed for the job. Oh well, one good thing, her car won't have to go outside after all, "It is an ill wind that blows no one any good," another proven adage. Next thing, tools. In no time at all, the staff at the local hardware store are calling you by your Christian name and the Manager never fails to throw you a big smile. They have never sold so many "G" clamps to one person before. Of course owning all these handy tools mean that you can now do those minor maintenance and repair jobs around the home, can't you? Do not miss the opportunity to point this out to your dear one.

One good thing, you can now return that little pistol drill you borrowed from your Father-in law years ago. You now own a much better one, multi speed and reversible. Anyway his old B and D had a ring of sparks flying around the commutator when it was switched on, a good thing you got rid of it before it gave real trouble. Then there are the specialist aero tools that you have to buy at U.S.A. prices. Of course you can sell those to the next aeroplane builder when you have finished. Point this out to "her indoors," but omit the fact that you will have to sell at N.Z. dollars.

Where have we got to? Wasn't the title, "How To Build An Aeroplane?" I don't really know how to tell you. You will just have to find out the hard way, like we did. Stick to it, keep working, keep dreaming, "it won't happen overnight, but it will happen." When you get back from your first flight, you will be so excited, you won't know whether to laugh or cry, and will be walking on air. Get away home, mow the lawns and fix that damned dripping tap.

Don Palmer
NZL



PAW - The Macclesfield Masterpieces!



Adrian Duncan is a 75 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 PAW engines. The full article and even more articles can be found at Adrians web site <http://adriansmodelaeroengines.com>.

It's well-known that the initials PAW stand for "Progress Aero Works". This very successful business was established during the WW2 years by one of the more iconic and perhaps under-appreciated figures in British model engine history - J. G. "Gig" Eifflander. Joachim Gunter ("Gig") Eifflander was born 1922 in Krefeld, Germany. In 1932 his father obtained a position as the manager of a silk mill located at Macclesfield which made the family move from Germany to Macclesfield.

At school, Gig proved to be an outstanding pupil and his scholastic prowess gained him early admission to Manchester University, where he studied engineering while working part-time at the well-known firm of Metropolitan Vickers in Manchester. He eventually earned an intermediate B.Sc in engineering. Having emigrated from Germany to England only seven years prior to the outbreak of war, the Eifflanders became viewed as "enemy aliens". Consequently, Gig's employment at

Metropolitan Vickers was ended by the outbreak of hostilities. Even more problematically from a family standpoint, his father also lost his position in the silk industry.

The priority for the family now became simple economic survival. Gig contributed by finding work at a local garage. He also started a "cottage industry" at home in the evenings, making hand-carved propellers, wheels and other accessories for model aircraft. Gig's success in this line of work quickly grew and expanded premises were required. He gained the use of a disused tennis pavilion, converting it by enclosing the verandah. In the former verandah space he installed a set of copy mills of his own creation which were used to produce his increasingly popular Trucut beechwood airscrews. This marked the beginning of Progress Aero Works.

The former tennis pavilion soon became a small factory. A basic metalworking machine shop was installed in the main room, although this part of the operation suffered from the ingress of beechwood sawdust from the prop-making activities. The whole Eifflander family became involved with Gig's increasingly successful venture - even his grandmother worked there, as did his parents, his wife Elizabeth, his brother Wolf and his sister. Gig made his first I/C engine in 1945 and naturally, this was a spark ignition unit, but in 1947 Gig saw his first diesel engine promptly deciding to have a go himself. His first diesel was a 2.2 cc sideport design, but he soon switched to a 2.5 cc rear induction rotary valve model. Some seven or eight of these were made for Gig's own use and that of his friends.



Gig E - 2nd place in 1950 Gold Trophy.

The Early Eifflander Designs

Gig soon became aware of the potential advantages of rotary valve induction. This led him to commence experiments with disc rear rotary valve (RRV) induction, initially grafting such a system on to his earlier sideport model which had now been bored out to 2.5 cc. The design was quickly finalised into a cleaner and more streamlined package which featured a twin ball-race shaft.

An early insight which was to greatly inform Gig's future designs was his realisation that

while a twin ball-race shaft offers considerable potential for performance enhancement, all of the potential benefits can be undone if the bearing alignment isn't perfect. It was this realization that was to lead him to adopt the single rear ball race arrangement in his initial commercial designs. In later years he used to quip that a single rear ball-race engine might well be 10% more powerful than a plain bearing equivalent, but a twin ball-race version of the same engine could be up to 3% less powerful!

Even so, Gig's earlier non-commercial competition models used twin ball races. The need for perfect alignment explains why the front housing of his original disc-valve model was a screw-in component - this facilitated the set-up for the tricky process of boring the main journal and ball-race housings in perfect alignment. An illustration of how far Gig was prepared to go in this regard is provided by the arrangement of his next design. This was another twin ball-race disc valve model having an integrally-cast backplate.



Eifflander Special - disc valve variant.

The intake was now straight in from the rear as opposed to the sideways alignment used earlier. However, the engine also featured an integrally-cast main bearing housing! Given the fact that the backplate was not removable! Given Gig's well-demonstrated commitment to practicality in his commercial designs, it's scarcely surprising that he didn't stick with this arrangement for very long! However, he did produce some 50 examples of this design, as mentioned earlier.

At some point in the mid 1950's Gig evidently came to the conclusion that a well-developed crankshaft front rotary valve (FRV) induction arrangement could work just as well as the RRV design used up to that time. Accordingly, his next development involved a switch to FRV induction. The crankcase casting now featured a vertical intake on top of the main bearing housing.





Eifflaender side-intake RRV model.

This seems to have been the final design evolution prior to the early 1957 appearance of the PAW Eifflaender Special in commercial form. The only real changes from the earlier FRV prototype were a reduction in the external diameter of the main bearing housing and the elimination of the front ball race. The First Commercial PAW Appears.

By the mid 1950's, the use of wooden propellers was fast losing ground to the new plastic "unbreakable" propellers. It was evident that if PAW was to survive, the company would have to develop a product line which went beyond the wooden propeller and reboring fields.

During 1956, Gig had developed the previously-mentioned revised 2.5 cc diesel design featuring crankshaft front rotary valve (FRV) induction. The result was the early 1957 release of the first-ever commercial PAW powerplant - the 2.5 cc "Eifflaender Special" diesel. Gig began by making a batch of 25 examples of this model and these were quickly sold out. 50 more examples came on order immediately and PAW was in the model engine manufacturing business!

Some idea of the basic excellence of the original PAW design can be gleaned from the fact that in 65 years of continuous production, the biggest single visual change has been the intake venturi being made removable instead of integrally cast! In fact, the only other major changes were the elimination of the cast iron bushing which helped to support the shafts of the earlier models and the use in some models of twin ball-races supporting the shaft.

The PAW 249 "Eifflaender Special"

The new model was a basically conventional 2.5 cc radially-ported crankshaft front rotary valve (FRV) diesel with a few interesting design features which lifted it out of the rut. Bore and stroke were 15.16 mm and 13.67 mm respectively for a displacement of 2.467 cc. These figures were to be retained throughout the long production life of the classic 2.5 cc PAW diesels. The engine weighed a commendably light 141 gr.

The Special was built up around a well-produced gravity die-cast crankcase unit which incorporated the main bearing housing and vertical intake in a single unit. A noteworthy feature was the unusual length of the beam mounting lugs. The steel cylinder liner was perfectly cylindrical externally, being secured by three screws passing through suitably-placed holes in the slip-on light alloy cooling jacket to engage with tapped holes in the upper crankcase deck. The liner was vertically located at its base by a narrow shelf machined into the installation bore in the upper crankcase.

Exhaust porting consisted of three rectangular apertures machined into the liner. The transfer porting was unusually well developed, consisting of three very large internal flutes which tapered towards the top and terminated just above the level of the exhaust ports' lower edges. The exhaust period was of the order of 140 degrees. The cast iron piston drove the one-piece steel crankshaft through a light alloy conrod of conventional British "dog bone" pattern, albeit having a far larger than usual upper ball end giving a small end bearing of adequate length with good lateral stability. Main journal diameter was a generous 9.52 mm. The internal gas passage diameter was 5.16 mm, leaving adequate wall thickness for strength.

The shaft ran in a composite bearing consisting of a ball-race at the rear and a thick cast iron sleeve forward of the ball-race. The inclusion of this sleeve allowed the provision of a very large cut-out in the sleeve which communicated with the integrally-cast vertical intake and formed the induction register. This cut-out also served as a mixture accumulation chamber to pre-charge the system for the next induction cycle.

The induction port in the actual shaft had a relatively narrow elongated race-track shape which combined with the previously-mentioned cut-out to provide very rapid opening and closing of the induction system along with a lengthy full-open period. Induction timing was a generous 175 degrees (45 deg. ABDC to 40 deg. ATDC). This was supplemented by an equally generous 60 degree sub-piston induction period.



Eifflaender Special - alternative disc valve variant.

The needle valve was angled back to the left, providing easy access with the engine mounted either upright or sidewinder. The engine was completed by a screw-in backplate at the rear. As one might expect, quality at this level didn't come cheap - the engine was introduced at a price of £6.50, pushing up towards Oliver territory and well over £2 more than most of the opposition.



PAW Eifflaender Special no 105.

The Range Expands - the PAW 149

As noted earlier, the PAW 249 Eifflaender Special was very far from being the least expensive 2.5 cc diesel of its day. We previously noted Gig Eifflaenders' desire to produce quality engines at prices which the average aeromodeller could afford. The result of his deliberations appeared in March 1959 in the shape of the 1.5 cc PAW 149 model. The £4.30 selling price of this engine was still well above average for a 1.5 cc diesel - the popular A-M 15 sold at the time for £2.98 while the excellent FROG 150R was tagged at a bargain price of £2.66. However, the P.A.W 149 was over £2 less expensive than the companion 249 Eifflaender Special which continued in production.

To all intents and purposes, the PAW 149 was simply a scaled-down and slightly restyled version of the 249 Eifflaender Special. However, the absence of a ball bearing at the rear of the shaft was symptomatic of the fact that every effort was being made to minimise costs while maintaining established PAW standards of quality. A full length cast iron bushing was used to support the unusually substantial crankshaft, which had a heroic main journal diameter of 8.73 mm.



PAW 149

The new model featured bore and stroke dimensions of 12.70 mm and 11.68 mm for a displacement of 1.48 cc. The engine weighed in at 99 gr - somewhat higher than average for a plain bearing 1.5 cc diesel, but the extra weight was put to very good use. The substantial crankshaft, the sturdy cylinder and the cast iron main bearing bushing accounted for much of the extra weight.

Induction timing was somewhat more conservative in this model than it had been for the 249 Special. The induction period was reduced to around 145 degrees (60 deg. ABDC to 25 deg. ATDC). The early closure was made possible by the fact that a generous 60 degree sub-piston induction period continued to be featured. The exhaust period of 140 degrees was retained, but the tops of the transfer flutes were raised considerably to overlap the exhaust to a large extent, thus minimizing the blow-down period.

Further development - PAW 249 Mk III

The success of the 249 Eifflaender Special and the companion 149 had enabled Gig Eifflaender to invest in some additional equipment which enhanced his production capabilities. Building upon this, he set his mind towards the development of a revised 2.5 cc model which could be sold at a lower price while retaining the positive qualities of the original design. The result was the late 1960 release of the PAW 249 Mk. III - the first and second versions of the Eifflaender Special were viewed as the 249 Mk. I and Mk. II models. Bore and stroke remained unchanged from the previous model at 15.16 mm and 13.67 mm respectively for a displacement of 2.467 cc. The engine's weight had crept up very slightly to 148 gr, still a very modest figure for a high-performance ball-race 2.5 cc diesel.



PAW 249 Mk III.

Internally, the three transfer flutes were extended upwards to overlap the exhaust ports almost completely, resulting in a minimal blow-down period. To facilitate this change, the exhaust ports were now cut using a tool which produced an opening which was narrower at the bottom than at the top, thus creating more space between the exhausts to accommodate the tapered top portions of the extended upper transfer ports. The cylinder material was also changed from silver steel to heat-treated high-tensile steel.

The induction arrangements were also modified, the crankshaft port being made slightly longer and narrower. In conjunction with a slightly narrower aperture in the cast iron main bearing sleeve, this resulted in far more conservative induction timing closely approximating that used in the PAW 149. The induction period was now 140 degrees (65 deg. ABDC) to 25 deg. ATDC). The 60 degree sub-piston induction period was maintained.



PAW 3.3 cc CT3 Diesel.

The Next Step - the PAW 19-D

With the advent of the 249 Mk. III, PAW had a very capable performer in the 2.5 cc category. This dovetailed nicely with the displacement limits established by the FAI for free flight power events as well as control line team racing. However, this was a period during which control line combat was enjoying a very high level of popularity in Britain. Moreover, the S.M.A.E. displacement limit for combat was then set at 3.5 cc. The absence of mega-powerful 3.5 cc diesels at the time meant that most competitive fliers used well-tweaked 2.5 cc competition powerplants such as Copeman-tuned Oliver Tigers and works-tuned Rivers Silver Streaks.

It didn't take Gig Eifflaender long to recognise the market niche created by this situation. He took a look at his very successful basic design which had worked so well in 1.5 cc and 2.5 cc displacements, coming to the conclusion that the 2.5 cc design could be stretched out to over 3 cc without unduly stressing the components or increasing the weight. It would also undercut the high-performance 2.5 cc opposition very significantly in terms of price - a standard unmodified Oliver Tiger Mk. III sold at the time for £6.50, while a works-tuned Rivers Silver Streak Mk. II would set you back £8.78. Accordingly, Gig went ahead and drew up the design for a new model to be called the PAW 19-D Combat Special. This was put into production in April 1961 and the selling price was set at a very competitive £5.23.

As we would expect, the new model followed the design of the PAW 249 Mk. III almost exactly. A positive selling point was the fact that the 19-D was based upon the same

crankcase casting and mounting hole configuration as the 249 model, meaning that it could be used as a straight bolt-in replacement for the smaller engine in the same model. This might lead one to assume that the additional displacement was achieved solely through a bore increase. In fact, both bore and stroke were increased to 16.25 mm and 14.99 mm respectively, making the 19-D a very slightly longer-stroke motor than the 249. Displacement of the new model was 3.186 cc, while weight had crept up to 160 gr. Most ball-race 2.5 cc diesels weighed more than this, while the displacement fell well within the S.M.A.E. class limits for control line combat.

It's perhaps worth recording the fact that Gig Eifflaender later managed to squeeze a little more displacement out of the same basic design! During the 1990's, the British vintage diesel combat event was open to plain bearing engines up to 3.5 cc displacement. The Eifflaenders came up with a built-to-order plain-bearing variant called the Combat Special CT3 (the CT standing for Combat Tuned), in which both bore and stroke were further stretched to 16.50 mm and 15.50 mm respectively for a displacement of 3.32 cc. Amazingly, the same case was still used, albeit with the removable venturi which was in use by that time, although some additional internal machining was required to accommodate the extra stroke. This variant weighed in at a still-reasonable 174 gr.



PAW 19-D Mk II

Returning to the original PAW 19-D of 1961, the crankshaft continued to be supported by the same combination of a rear ball race and a cast iron bushing. However, some internal modifications had to be made. A thicker gudgeon (wrist) pin was used along with a conrod having a wider small end bearing. The crankshaft's main journal length was very slightly extended, while the induction aperture through the cast iron bushing was widened a little to give an extended induction period of some 155 degrees (55 deg. ABDC to 30 deg. ATDC). Both exhaust and transfer ports were also enlarged to the extent made possible by the greater diameter of the new cylinder liner. In all other respects the 19-D was more or less identical to the companion 249 Mk. III model.

Further PAW Developments

The 19-D's success was such that it became the catalyst for a somewhat controversial set of rule changes. The trigger seems to have been the engine's performance at the 1962 British Nationals, where two contestants using 19-D's somehow managed to tie for 1st place in the combat event. The success of this relatively inexpensive and readily available powerplant against the far more costly and exclusive tuned Olivers and the like in which some participants had made a considerable investment didn't go down well in some quarters - people didn't take kindly to their Ferraris being beaten by a Volkswagen! This seems to have led to pressure being applied to the S.M.A.E. to draw the teeth of the larger engines through changes to the rule book for the 1963 season and beyond.

The first such change was the reduction of the maximum displacement for S.M.A.E. combat to 3.2 cc, recognising the existence of the PAW 19-D but eliminating such engines as the Rivers Silver Arrow. The remaining threat to the elite 2.5 cc establishment was the PAW 19-D. After its showing at the 1962 British Nationals, it was clearly felt that something had to be done to rein it in. This was accomplished very simply by adding a rule to the effect that engines over 2.5 cc used in the S.M.A.E. combat event had to be plain bearing designs! At one stroke of the rule-makers' pen, the PAW 19-D had been eliminated!

Of course, the rule-makers overlooked the fact that they were dealing with Gig Eifflaender! Gig's response to this bureaucratic elimination of his engine from the competition was both simple and direct - he immediately came up with a plain bearing version of the same engine! This was released in early 1963 as the PAW 19-D Mk. II, just in time for the 1963 season. To sweeten the pot, the elimination of the ball bearing allowed the selling price to be reduced to £4.43.

The 19-D Mk. II was basically the same engine as its predecessor, but without the rear ball race. To compensate for this, the crankshaft journal diameter was increased to a whopping 11.1 mm, with a corresponding increase in the induction porting dimensions. Gig claimed an output of over 0.400 BHP @ 15,500 RPM for the revised model. The introduction of the 19-D Mk. II indicated that Gig Eifflaender wasn't going to "go quietly"! The displacement issue was eventually resolved very simply by setting the maximum displacement for control line combat in Britain at 2.5 cc. Exit the 19-D, at least from "official" events!! This did admittedly have the merit of bringing British combat into line with the FAI displacement standard.

Despite the confining rule changes, a demand remained for an even more powerful rendition of the 19-D, even if it couldn't be used in combat events run to strict S.M.A.E. rules.

This ongoing demand led to the late 1964 re-introduction of the 19-D in single ball-race form, just as it had been released originally. The larger shaft of the 19-D Mk. II was retained, necessitating the development of a custom ball bearing specifically designed to match. The new model was called the PAW 19 BR. This was the first of many BR models to be offered by the company over the years. The PAW range was now well established in design terms. The only noteworthy feature of the more recent models which had yet to appear was the domed combustion chamber formed on the underside of the contra piston (commonly referred to as the squish head) in conjunction with a flat-topped piston.



PAW 249 Mk IV.

This feature finally appeared in mid 1966 in the shape of the PAW 249 Mk. IV. In addition to the flat-topped piston and squish head, this model incorporated a few other changes which pointed the way ahead. For one thing, the sub-piston induction was eliminated in order to enhance performance with a silencer fitted - an unmistakable sign of the times.

To restore power output, a revised shaft was used which had a massive main journal diameter of 11.1 mm with correspondingly enlarged gas passages. Gig Eifflaender himself characterised this model as "the sweetest-handling PAW of them all". He made the quite credible claim that the Mk. IV developed 0.340 BHP @ 15,000 RPM in standard unsilenced form.



PAW 249 TBR Schnuerle.



PAW's Union Street premises.

In design terms, the range was now finalised apart from a later switch to a removable intake venturi to facilitate the installation of an R/C throttle. Squish head variants of the 149 and 19 quickly appeared, being identified by the DS suffix, as were later renditions of the 249 model. New models in other displacement categories soon followed as well.

The More Recent Years

The PAW range went from strength to strength, proving to be by far the most durable British model diesel range of them all. Further models were added as the years went by. The majority of these engines remained true to the well-established design configuration developed by Gig Eifflaender way back in the 1950's, although there were a few experiments with Schnuerle porting. A number of models were also offered in twin ball-race (TBR) configuration. PAW eventually covered the displacement range all the way from 0.55 cc up to 10 cc.



Gig Eifflaender 1922-2005.

Gig Eifflaender retired (or semi-retired, if you believe Tony!) in 2000, passing away on December 1st, 2005 at the age of 83. One of his sons, Paul, retired in 2012, but the PAW company remains in operation today (2022) in the capable hands of his other son Tony.

/Adrian Duncan

Los Angeles Money Nats

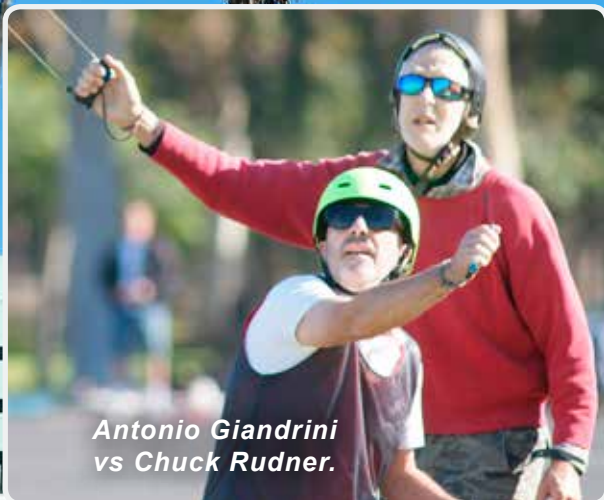
We went to the F2D competition in Los Angeles on November 12-13, 2022, a competition organized by Bill Maywald called LA Money Nats. On Friday they had a Kill Combat contest, a simplified F2D formula where the winner is the one who cuts the whole streamer first and they start with a single model for engine warm-up and the pilot must start the engine by himself and then quickly enter the circle and take off. Unfortunately we were unable to participate on Friday race because our luggage was missing delayed by a day and a half so we were only able to fly the F2D contest.

27 competitors took part in the F2D competition among the Americans there were 4 Mexican and we 2 Italian pilots. The level of American pilots has grown a lot in recent years, 99% of whom have a very high level of preparation and flying technique in no way inferior to the best European pilots. Even the materials are used in the best way, performing at the top. After 8 rounds of flying the winner was Cary Minor from Minnesota followed by his brother Andy, third place went to the Mexican Leonardo Silva. A tie for fourth place between Kansas pilot Jeff Johnson and

the Italian Antonio Giandrini, who unfortunately lost his chance to reach the final as his bladder blew in the air... an absolutely rare thing to happen. The winners were given, in addition to the commemorative cup, a substantial prize in money, \$500-400-300!! The Italians also brought the Alessandro Bossi Memorial trophy, a trophy offered by the family for the team that finishes first. Alessandro was an Italian combat pilot who died prematurely in 1986 at the age of 26.

It was decided to bring this traveling trophy up for grabs in 2021 wherever at least two Italian pilots participate in an International race. The national team that wins it three times keeps it forever. In 2021 it was won by the Spanish team and in 2022 twice by the Ukrainian team (GBR and ITA world cups in Lugo Italy). This time the Hammer Jam USA team composed by Cary and Andy Minors together with Dave Fisher won it. Congratulations to the organization which meant that the success of the event took place in the best and smooth possible way. Thanks to the judges especially those in the pink jersey (Anna, Arlene, Tammy and Muffy) who gave a feminine touch to the event.

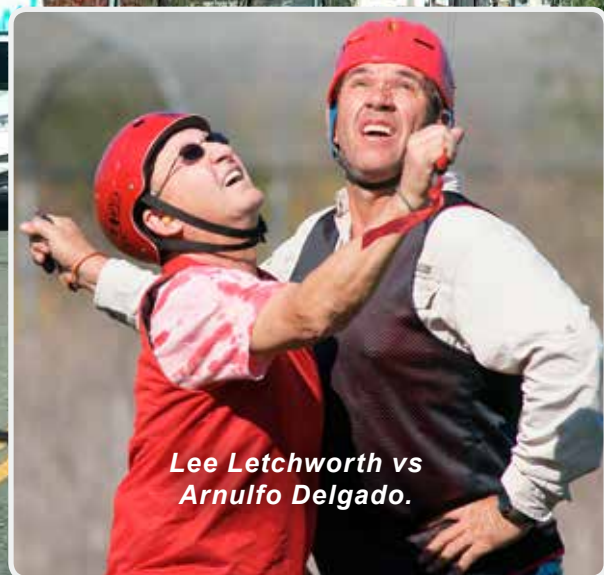
Adriano Molteni
ITA



Antonio Giandrini
vs Chuck Rudner.



Cary Minor vs
Adriano Molteni.



Lee Letchworth vs
Arnulfo Delgado.



Andy Minor launching
for brother Cary.

LA Money Nats 2022 was a breath of fresh air. Why do I say that, because we had several pilots come out and fly that we have not seen in a few years and we had some Italian friends come over to fly which allowed us to see 27 entries in F2D and 22 in Fast 2d! Mark Rudner came to fly and looked really good, knocking a little rust off and he will be back on track. Darrin Albert showed up and was flying good, he has not flown in 6 years and he was flying good too. It seemed like things were back to normal even though we all know what is going on around the world. We all have problems and stress in our every day lives but when I get to do something fun and exciting like flying combat you kind of forget about all of your worries. My brother Cary and I were on the fence about coming because of some stuff going on in our work lives and Dave Fischer was also on the fence but we talked each other into making the trip and we had a great time!

Dave Fisher did a lot of pitting for several different pilots who needed help. Cary helped out pitting and so did I but we mostly kept our three amigos team together for pitting throughout both of the tournaments.

We were lucky to have long time combat enthusiast and professional photographer Charlie Johnson on sight taking pictures and gathering data from this contest. Italy was represented by Adriano Molteni and Antonio Giandrini and let me tell you these guys are good people and good pilots! Cary Minor was trying to stay warm, each morning was nippy to say the least but about 10:00 am it was shorts and T-shirt weather until about 5 pm. The Winners of Friday (Veterans Day) Fast 2d: 1st place Dave Fischer, 2nd place Greg Hill, 3rd place Cary Minor, 4th place Arnie Delgado.... I think I was 5th but not certain about that. Greg Hill has not flown much the last several years but it was apparent he came

to play. Greg embodies the old school "fast combat guy" he used to fly for team Holfelt and was sponsored back in the day. He was flying crazy good and Dave Fischer who was also flying good lost his first match against Greg and he had to come up with a different strategy to come back and beat Greg twice to take the win! Congratulations to the Friday winners. Oh, Cary Minor sporting the American Eagle shirt in honor of our veterans; Thank you to our veterans for your service and sacrifice!

The hospitality at this contest was amazing, Anna (Bill Maywalds better half) went all in on providing coffee and pastries in the morning for the competitors and at lunch she put on a spread for sandwiches and desserts. There were some evening activities too that were extra nice. The "Hot Ladies of Combat"; Arlene always helps run these contests and we really appreciate that. Tammy Jo helped judge the entire contests as did Muffy and Anna! We really appreciate you ladies! Fast was a lot of fun and a good warm up for the F2D tournament.

So Saturday started off the F2D tournament, the organizers determined that double elimination would be the rule due to there being 27 pilots. We were warned to be ready for your match as you would not get a "oops" if you were not ready. We were able to get through three rounds on Saturday with the sun light going down as we flew the last few matches. There was one competitor running AKM's and his stuff was definitely running. Everyone else were running Fora engines and they were fast and consistent. We had lots of good matches with a few rematches on Saturday.

The Italian team was a strong team and they were making their way through the crowd. Radik Magzianov made it to the tournament,

he was flying strong but he did not have luck on his side this time. Radik is from Moldova and now lives in Miami, Florida. We had lots of fun matches and there was some very intense matches that went down to the wire. I was matched up against Antonio Giandrini close to the finals and we ended up having to fly each other three times to determine the winner. Antonio won that round giving me my first loss. There were a few rematches on Sunday but the contest ran very smoothly and quickly over all.

The results for this years 2022 LA MONEY NATS is as follows:

1st	CARY MINOR	USA
2nd	ANDY MINOR	USA
3rd	LEONARDO SILVA	MEX
4th	ANTONIO GIANDRINI	ITA
	JEFF JOHNSON	USA

Some "extra" awards were awarded as well, if you look closely both Chuck Rudner and Leo Silva have significant bandages on their middle fingers, best injury of the contest went to Leo Silva and he managed to fly very well the remainder of the tournament with his injury! The Italian's picked the pitcrew that measured up to their traveling trophy award that was started in memory of one their close friend Alessandro Bossi that passed away several years ago. This was a great tournament and most everyone had a great time with amazing hospitality, good judges and nice weather! Come join us next year, until then keep your lines tight and make combat contagious!

Andy Minor
USA



Bill Maywald with his 21st Century Monoboom model.



Leonardo Silva won "Injury of the contest". Runner up was Chuck Rudner.



The Hammer Jam Team (Cary, David, Andy) won the Alessandro Bossi Memorial Trophy.



The irreplaceable ladies Anna, Tammy Jo, Muffy and Arlene.

Oktoberklippet

16–17 okt 2022

Årets andra mail-tävling bjöd på tätspanning i toppen mellan 1.5-dieslar där både Ingemar och Lennart slog rekordet från i våras. Efter dessa två i toppen var det ovanligt många på höga 90 med små marginaler emellan piloterna. Dessa marginaler gör att varje detalj i flygningen spelar roll för slutresultatet och kanske ska man inför vintern göra upp en lista på alla detaljer man kan slipa på inför nästa säsong. Vi ser fortsatt en mångfald i de klasser som flygs och med många olika motortyper då det denna gång flögs med 15 olika motorer i 7 olika klasser. Ju fler som sorterar ut sina prylar och får ordning på allt desto jämnare blir det i toppen även om inte alla kommer att slå rekord. I E-W blev våra franska vänner ensamma att flyga då vädret i Schweiz inte medgav flygning. Webra Rekord Cup hade bara två deltagare där Stefan under hela säsongen lyckats ligga tiondelar framgå sina motståndare. Ett trevligt inslag för oss som flög på Brättelund var att Leo Voss från Holland kom på besök. Hans son studerar i Göteborg så det kan kanske bli fler besök vid framtida W-tävlingar.

■
Ingemar Larsson



Jose Cotterel FRA



Leo Voss NED



Martin Larsson



Daniel Janan FRA



Stefan Olsson hjälper Leo Voss.



1 – Ingemar Larsson
– 104,0 %



2 – Lennart Nord
101,0 %



3 – Johan Rasmussen
99,4 %

RESULTAT Weatherman Vintage Speed OKTOBERKLIPPET – 16-17 oktober 2022

Placering, Namn, Klubb, Nation	Klass	Tid	Hastighet	%	Motor
1. Ingemar Larsson, Vänersborgs MFK SWE	1.5D	20,1	144,1	104,0	THK
2. Lennart Nord, Västerås FK Modell SWE	1.5D	20,7	139,9	101,0	Fora
3. Johan Rasmussen, Vallentuna MFK SWE	6.6G	17,6	164,5	99,4	K&B
4. Jens Geschwendtner, MFK Comet DEN	3.5G	18,3	158,2	98,9	Picco
4. Niels-Erik Hansen, MFK Comet DEN	2.5G	17,5	165,5	98,9	Cyclon
6. Harry Kolberg, Skedsmo MFK NOR	3DA	25,9	111,8	96,5	DA Drabant
7. Thomas Olsson, Trollhättans MFK SWE	1.5D	21,7	133,4	96,3	THK
8. Per Stjärnesund, Västerås FK Modell SWE	1.5G	20,2	143,3	96,0	Parra
9. Martin Larsson, MFK Sländan SWE	2.5D	20,2	143,3	88,1	Fora
10. Stefan Olsson, Uddevalla RFK SWE	1.5G	22,3	129,8	87,0	Parra
11. Milenko Kvirgic, Karlskoga MFK SWE	2.5D	23,1	125,4	77,1	Fora
12. Erik Huss, MFK Jordfräsarna SWE	2.5D	24,6	117,7	72,4	Hawk
13. Sverker Evans, Nyköpings MK SWE	2.5D	26,5	109,3	67,2	MVVS
14. Jose Cotterel, AMCVS FRA	1G	17,3	83,7	57,2	Cox Tee Dee
15. Daniel Janan, ACSE FRA	2.5G	0	0	0	Super Tigre
15. B-O Samuelsson, Västerås FK M SWE	2.5G	0	0	0	Parra
15. Leo Voss, NLC NED	1G	0	0	0	Fora

E-Weatherman

Daniel Janan, ACSE FRA	0E	13,2	109,7	95,5	T-Motor
Jose Cotterel, AMCVS FRA	0E	14,3	101,2	88,1	E-Max

Webra Rekord Cup

1. Stefan Olsson, Uddevalla RFK SWE	30,7	94,3
2. Harry Kolberg, Skedsmo MFK NOR	31,5	91,9



Sverker Evans



Erik Huss



Daniel Rota SUI

Novemberkåsan

5-6 nov 2022

I årets tredje mail-tävling fortsatte 1,5-dieslarna att dominera fast denna gång fick Lennart till en bra flygning vilket både gav ett rekord med 1/10 sekund samt vinst i tävlingen. Ingemar lyckades inte svara på detta och flög istället på 1/10 över rekordet. Tätt så det förslår. Våra danska vänner hade tänkt flyga men till slut kom för många saker i vägen, bl a Jens 75-årsdag (Grattis!!) så det blev ingen flygning i vårt grannland. Men Harry Kolberg försökte återigen pressa sin DA Drabant ner mot rekordet utan att lyckas denna gång. Men man kan tro att Drabant-rekordet snart kommer att slås. Sverker Evans hade som mål att återta sitt rekord i klass 2,5V (Viking) som han nyligen förlorade till Luis Petersen. Men det höll inte hela vägen fram fast 97,8% är inte fy skam det heller. Våra flygare i E-W hade plockat fram allt de har och flög i flera klasser där Daniel Rota lyckades bäst och pressade rekordet i två av klasserna. I Webra Rekord Cup hade Ingemar nu plockat fram sin modell så att det blev tre tävlande. Harry hade nu ställt in motorn bättre varför han och Stefan delade segern med lika tid. Detta var årets sista mail-tävling så nu är det bara att låsa in sig i byggkammaren och åstadkomma underverk inför nästa säsong. När detta skrives har det snöat hela dagen och är totalt vitt ute vilket inte lockar till flygning med skidor på modellen utan istället mys i sin "man cave". Vi ses på värkanten!

1 – Lennart Nord
– 100,5 %2 – Ingemar Larsson
– 99,5 %3 – Per Stjärnesund
– 99,0 %

Ingemar Larsson

RESULTAT Weatherman Vintage Speed NOVEMBERKÅSAN – 5-6 november 2022

Placering	Namn	Klubb	Nation	Klass	Tid	Hastighet	%	Motor
1.	Lennart Nord	Västerås FK Modell	SWE	1.5D	20,0	144,8	100,5	Fora
2.	Ingemar Larsson	Vänersborgs MFK	SWE	1.5D	20,2	143,3	99,5	THK
3.	Per Stjärnesund	Västerås FK Modell	SWE	1.5G	19,6	147,7	99,0	Parra
4.	Sverker Evans	Nyköpings MK	SWE	2.5V	37,1	78,0	97,8	Viking
5.	Harry Kolberg	Skedsmo MFK	NOR	3DA	26,2	110,5	95,4	DA Drabant
6.	Stefan Olsson	Uddevalla RFK	SWE	1.5G	20,8	139,2	93,3	Parra
7.	Thomas Olsson	Trollhättans MFK	SWE	1.5D	21,6	134,1	93,1	THK
8.	Martin Larsson	MFK Sländan	SWE	2.5D	21,4	135,3	83,2	Fora
9.	Leo Voss	NLC	NED	1.5D	25,8	112,2	77,9	TYR
10.	Erik Huss	MFK Jordfräsarna	SWE	2.5D	24,5	118,2	72,7	Hawk
11.	Milenko Kvirgic	Karlskoga MFK	SWE	2.5D	25,3	114,5	70,4	Fora
12.	Jose Cotterel	AMCVS	FRA	1G	15,6	92,8	63,5	Cox Tee Dee
13.	Daniel Janan	ACSE	FRA	2.5D	0	0	0	Super Tigre

E-Weatherman

Daniel Rota	GAM	SUI	2.5E	18,7	154,8	102,7	Scorp. HK2520
Daniel Rota	GAM	SUI	1E	12,5	115,8	100,8	Turn. C2206
Daniel Janan	ACSE	FRA	1E	12,9	112,2	97,7	T-Motor
Daniel Janan	ACSE	FRA	3.5E	19,9	145,5	97,5	Leomotion
Jose Cotterel	AMCVS	FRA	1E	13,8	104,9	91,3	E-Max

Webra Record Cup

1. Stefan Olsson, Uddevalla RFK	SWE	31,4 s	92,2 km/h
1. Harry Kolberg, Skedsmo MFK	NOR	31,4 s	92,2 km/h
3. Ingemar Larsson, Vänersborgs MFK	SWE	31,7 s	91,3 km/h



Leo Voss med sin modell och sina supportrar/medhjälpare
'Bert Gijbertsen, Rob Olijve och Jacco de Ridder.

Dansk Mesterskab 2022

Dette års DM var mindre end normalt på grund af at combat folkene havde en "vigtig" udenlands sammenfaldende konkurrence.

Lørdagens afvikling var ret begrænset. 2 deltagere i icc. Minispeed som tidligere var en klasse med mange deltagere. Ingen fuldførte, så efter lidt lodtrækning, vandt Jens Geschwendtner uden tid.

F2A 2,5 speed havde 3 deltager. Niels Lyhne var den eneste der kunne registrere en tid og blev fortjent vinder igen, igen, igen. Ole Bjerager prøvede ihærdigt at få modellen i luften til en tid. En landing reducerede ham til træningsmodellen. Ingen tid men, en masse omgange ude af standen.

Stunt havde kun 2 deltagere og der blev kun fløjet 2 runder før Dan havde sikret sig sejren.

Combat havde 5 deltagere. Bjarne og Steen var klart de bedste. Så DM skulle afgøres i en finale, som Steen vandt og kunne modtage folkets hyldest.

I Weatherman med 6 deltagere startede

Niels-Erik med en stabil 100% flyvning med en 2,5 glød. Bjørn har lidt problemer med at få sin S/T op på mærkerne. 96% for ham. Jens fik endeligt styr på sin 3,5 glød og fik 104% på rekorden. Luis havde en løs propel på sin Viking model lig = o i første flyvning. Hans 2 resterende flyvninger blev aflyst af tyn og lorden.

Som sædvanligt et fint arrangement af Herning klubben. God mad og stemning.

Luis Petersen

F2A

Placering, Navn	Klub	Best
1 Niels Lyhne-Hansen	Herning	285,7
2 Ole Bjerager	Pingvinen	0
3 Jens Geschwendtner	Comet	0

F2B

Placering, Navn	Klub	Sum
1 Dan Hune	Herning	3353,9
2 Calle Fanøe	Herning	2865,0

Lag-DM

1 Herning	22 p
2 Comet	16 p
3 Pingvinen	4 p
4 Aviator	3 p

F2D

Placering, Navn, Klub	1	2	3	4	5	6
1 Steen Lysgaard Herning	V1	V4	T7	V8	V9	
2 Bjarne Schou Herning	V3	V5	V6	V7	T8	T9
3 Tobias B Nielsen (jr) Herning	V2	T4	T6			
4-5 Liv M Nielsen(jr) Aviator	T1	T5				
4-5 Kent Thorup Aviator	T2	T3				

Weatherman Vintage Speed

Placering, Navn, Klub	Klass	Tid	Hast. %
1 Jens Geschwendtner Comet	3.5G	18,1	160,0 104,4
2 Niels-Erik Hansen Comet	2.5G	17,3	167,3 100,0
3 Bjørn Hansen Comet	6.6G	18,3	158,2 96,1
4 Jesper B. Rasmussen Pingvinen	1.5D	24,2	119,6 86,3
5 Niels Lyhne-Hansen Herning	3.5G	26,6	109,1 71,1
6 Luis Petersen Comet	1.5G	0	0 0

København- mesterskab 2022

Efter at der er blevet afholdt KM i linestyring siden 1964 på Amager Fælled, blev det i år afholdt 23/10 i Borup i perfekt vejr. 15-16 grader og næsten ingen vind.

Vores gamle bane på Fælleden er blevet opsagt af København Kommune, så nu flyver vi linestyring i Borup med ny asfaltbane, klubhus og en nærliggende politi hundeklub!

Desværre var den nye asfaltbane uden græs og så leret, at man blev et par centimeter højere ved at gå ind til centrum.

Af samme grund var GY og F2F KM 2022 aflyst. Det vil blive afviklet næste år, når der er græs på banen.

Så vi fløj fra den gamle plastikmåtte i Weatherman. Men vores nye flise centrum er rigtig godt at flyve fra.

Luis Petersen



Der blev også fløjet Diesel combat. Ole Bjerager vandt over Jesper Buth.



Luis Petersen Viking 2,5 36,23sek. 104% og ny rekord. Niels-Erik Hansen Cyklon 2,5 G 17,03 sek. 101% og ny rekord. Jens Geschwendtner Picco 3,5G 18,1 sek. 100% tangering af rekorden. Jesper Buth. Parra 1,5D 22,9 sek. 88% af rekorden.



Niels-Erik med sin model.

Västerås Open

I ett strålande fint Västerås-väder så avgjordes sista speed-tävlingen för säsongen. Med Per Stjärnesund armskadad och inte i startfältet fanns stora möjligheter för andra att knipa den åtråvärda förstaplatsen i Speed Open. Med 5 super-taggade piloter i depån redo att flyga snabbast (4 st 2,5 cc och 1 st 5 cc) var det en helt öppen affär. I Speed Open räknas placeringen som procent av det gällande tävlingsrekordet i den motorstorlek man flyger, precis som i Weatherman Vintage Speed. Detta gör att man kan flyga med olika motorstorlekar men ändå tävla mot varandra.

Innan start bestämdes att vi skulle flyga 3 omgångar (man kan flyga 4) och Bengt-Olof Samuelsson som nyss var hemkommen från VM i Polen var väl lite favorit men han öppnade lite försiktigt med 243,2 km/h. Nästa att flyga var Ola Murelius, som inte tränat så mycket i sommar, fick en körning på 230,4 km/h och de andra tre fick ingen tid. I omgång 2 ökade Bengt-Olof till 258,0 km/h och fick dessutom Ulf Nygren till en tid på 193,4 km/h medan Mart Sakalov och Ove

Kjellberg nollade igen. Ola Murelius gav upp för dagen då han tyckte att första omgångens resultat räckte för honom. Bengt-Olof ökade igen till i omgång 3 och fick nu 259,2 km/h, även Ulf ökade till 206,8 km/h och uppnådde därför målet för dagen vilket var att flyga över 200 km/h. Mart och Ove hade ingen bra dag för det blev nollor även i denna omgången. Kanske lite mer träning till nästa år kan vara till hjälp?

Weatherman Vintage Speed såg 6 piloter komma till start och när röken lagt sig visade det sig att årets stjärnskott Johan Rasmussen vunnit och därtill satt nytt rekord i klass 6.6G med 100,5 %. Han var den ende som kom över 100 % då tvåan Per S övergivit sin 1.5-motor för att testa en Zorro 2.5 och med den "bara" kom upp i 98,2 %. Men trean Sverker Evans flåsade honom i nacken med 95 % medan övriga tre låg lite längre bak.

/Per Stjärnesund



Johan Rasmussen vann Weatherman.



Mart, B-O och Uffe flög F2A.

Weatherman Vintage Speed 2022-09-11

Placering	Namn	Klubb	Klass	Tid	Hast	%	Motor
1	Johan Rasmussen	Vallentuna MFK	6.6G	17,5	165,5	100,5	KB 40
2	Per Stjärnesund	Västerås FK modell	2.5G	17,6	164,5	98,2	Zorro
3	Sverker Evans	Nyköpings MK	2.5V	40,0	72,4	95,0	Viking
4	Kaj Johansson	Västerås FK modell	1.5D	23,9	121,2	87,4	Taifun
5	B-O Samuelsson	Västerås FK modell	2.5G	20,1	144,1	83,5	Nelson
6	Milenko Kvrpic	Karlskoga MFK	2.5D	23,7	122,2	57,1	Fora

Speed Open 2022-09-11

Placering	Namn	Klubb	Klass	Tid	Hast	%	Motor
1	B-O Samuelsson	Västerås FK modell	F2A	13,89	259,2	86,6	Profi
2	Ola Murelius	Västerås FK modell	F2A	15,62	230,4	76,9	Profi
3	Ulf Nygren	Team Tornado	F2A	17,4	206,8	69,1	KMD
4	Ove Kjellberg	Solna MSK	5cc	0	0	0	OK
5	Mart Sakalov	Västerås FK modell	F2A	0	0	0	Profi

Preliminär tävlingskalender 2023

Datum	Tävling	Klasser	Plats	Arrangör	Kontaktman
Fre 7/4	Häxvrålet	Weatherman, Classic Stunt	Inlag, Kungsbacka	KMFK	Michael Palm, 0730-77 48 63
Lör 22/4	Snobben Cup 1	F2B, Semistunt, Weatherman	Mygglanda, Nymölla	Snobben	Anders Hellsén, 0738-47 83 12
Sön 7/5	Linflygets Dag	Speed Open, Weatherman	Johannisberg, Västerås	VFK	Per Stjärnesund, 0738-04 23 41
Tor-Lör 18-20/5	World Cup F2B	F2B, Semistunt, W, Classic	Åbytorp, Karlskoga	KMFK	Niklas Löfroth, 0702-09 69 65
Lör 10/6	Oldtimerträff	Weatherman	Inlag, Kungsbacka	KMFK	Michael Palm, 0730-77 48 63
Lör 17/6	Kga-racet	Alla Speed- och Team-klasser	Åbytorp, Karlskoga	KMFK	Niklas Karlsson, 0703-73 89 97
Sön 2/7	Kga-combaten	Slow Combat, Combat 1.5	Åbytorp, Karlskoga	KMFK	Niklas Karlsson, 0703-73 89 97
Lör 29/7	Snobben Cup 2	F2B, Semistunt, Weatherman	Mygglanda, Nymölla	Snobben	Anders Hellsén, 0738-47 83 12
Lör-Sön 26-27/8	SM	F2A, F2B, F2C, F2D	Johannisberg, Västerås	Grenstyrelsen	Ingemar Larsson, 0703-40 44 05
Lör 9/9	Västkusträffen	F2B, Weatherman Inlag,	Kungsbacka	KMFK	Michael Palm, 0730-77 48 63
Sön 10/9	Västerås Open	Speed Open, Weatherman	Johannisberg, Västerås	VFK	Per Stjärnesund, 0738-04 23 41
Lör-Sön 23-24/9	Vbg-pokalen/RM	Slow Combat, Combat 1.5, W-man	Brättelund, Vänersborg	VMFK	Ingemar Larsson, 0703-40 44 05
L-S 30/9-1/10	Snobben Cup 3	F2B, Semistunt, W, Ringmaster	Mygglanda, Nymölla	Snobben	Anders Hellsén, 0738-47 83 12

Andra kända datum:

5-7/5	Världscup i Svitavy Tjeckien (CZE)	F2D
20-21/5	Swiss Champs i Schwalbennest Schweiz (SUI)	F2A, F2B, F2C
27-29/5	Världscup i Herning Danmark (DEN)	Alla klasser
23-25/6	Världscup (Jura Cup) i Cirié Italien (SUI)	F2B
29/6-2/7	Dubbelvärldscup i Wierzawice Polen (LTU+POL)	F2A + F2C
1-2/7	Världscup i Barcelona Spanien (ESP)	F2D
13-16/7	Dubbelvärldscup i Landres Frankrike (NED+FRA)	F2A+F2B+F2C
23-24/7	Världscup i Pepinster Belgien (BEL)	F2A, F2B, F2C
4-5/8	Världscup i Wloclawek Polen (POL)	F2A, F2B, F2C, F2D
6-12/8	EM i Wloclawek Polen	F2A, F2B, F2C, F2D
26-27/8	Världscup i Radfeld Österrrike (AUT)	F2B
7-10/9	Dubbelvärldscup i Lugo Italien (GBR+ITA)	F2A, F2B, F2C, F2D
24-26/11	Int V&V på Gran Canaria Spanien	Eurocombat, Old Time Stunt

Norska tävlingar/träffar (F2B och W)

Åpningstevne	22-23 april	Kristiansand
Sommerstevne	10 juni	Hvam
NM	12 augusti	Hvam
Årsavslutning	16 september	Hvam

Finska tävlingar (F2B)

FM 1	10 juni	Nummela
FM 2	15 juli	Kuopio
FM 3	12 augusti	Nummela
Ruska Classic	30 september	Kuopio

Results

F2B World Champs Wloclawek Poland 2022

Place	Name	Country	Qualify	Final
1	BURGER	SVK	2257,63	1124,54
2	KRAVCIK	CZE	2230,40	1124,29
3	HERNANDEZ	USA	2237,92	1111,90
4	SOLOMIANIKOV	UKR	2201,69	1111,19
5	XU Jun	CHN	2200,66	1108,10
6	BORZECKI	POL	2173,90	1107,58
7	MIESIAK	POL	2163,26	1092,40
8	DOLOBAC Jun	SVK	2174,10	1091,30
9	WADLE	GER	2164,70	1090,10
10	SCHREK	SVK	2149,43	1090,02
11	RAKOWSKI Jun	POL	2132,26	1085,81
12	HOLTERMANN	GER	2160,30	1079,97
13	CHAPOULAUD	FRA	2146,03	1077,27
14	BAJAIKINE	CAN	2137,33	1076,44
15	LIBER	BEL	2114,50	1066,42
16	MAGGI	ITA	2112,92	
17	HOWELL	AUS	2108,93	
18	RADOS	CZE	2100,02	
19	MALILA	SUI	2095,79	
20	GAUTHIER	FRA	2091,36	
21	KUBIK	POL	2083,56	
22	GASPAR Jun	SVK	2078,23	
23	VASILIAUSKAS	LTU	2076,06	
24	DALY	USA	2069,30	
25	PIGOUT	FRA	2068,93	
26	RUSH	USA	2066,46	
27	DALY Jun	USA	2056,66	
28	CHINGIS Jun	MGL	2046,56	
29	MOROSANU	ROU	2035,59	
30	KAPUSCINSKY	CZE	2024,93	
31	LOFROTH	SWE	2024,69	
32	SALEM	ISR	2023,12	
33	FIUSSELLO	ITA	2021,96	
34	ZENERE	ITA	2012,63	
35	MORBITZER	GER	2012,39	
36	NARANBAATAR	MGL	1940,56	
37	HELLSEN	SWE	1934,36	
38	BATTAM	AUS	1897,92	
39	ANKER	NED	1895,56	
40	BERNOTAS	LTU	1882,49	
41	EIZENBERG	ISR	1872,00	
42	VASKYS	LTU	1864,83	
43	FIUSSELLO Wom	ITA	1832,46	
44	MUNKHMANDAKH	MGL	1810,99	
45	PALM	SWE	1793,36	
46	NOMIN Jun Wom	MGL	1770,32	
47	RAKOWSKA Jun Wom	POL	1768,06	
48	HUNE	DEN	1744,92	
49	RUSSBACH	SUI	1740,96	
50	BAYARBAT	MGL	1678,19	
51	PALM Jun	SWE	1665,86	

F2A World Champs Wloclawek Poland 2022

Place	Name	Country	Best
1	VALISHEV, Alexander	USA	308,8
2	VALISHEV, Ivan Jun	USA	306,5
3	GROSSI, Luca	ITA	305,0
4	ELEKES, Imre	HUN	304,0
5	CSOMA, Gyorgy	HUN	300,3
6	BIELYKOV, Valerii	UKR	299,3
7	HUGHES, William	USA	299,0
8	ESSELAAR, Han	NED	298,8
9	SZVACSEK, Ferenc	HUN	298,4
10	STJARNESUND, Per	SWE	297,3
11	OSOVYK, Oleksandr	UKR	296,2
12	LYHNE-HANSEN, Niels	DEN	295,8
13	SOBALA, Tomasz	POL	295,2
14	HEMPEL, Patrick	USA	294,8
15	GORDIYENKO, Oleksandr	UKR	294,2
16	ROSTISLAVOV, Anthony	FRA	294,1
17	AUBE, Jean Marc	FRA	293,6
18	WALANIA, Kacper Jun	POL	293,0
19	MIS, Artur	POL	291,5
20	VALO, Jari	FIN	291,0
21	HOLECZEK, Robert	POL	287,8
22	PASTUREL, Remi	FRA	284,7
23	SAMUELSSON, B-O	SWE	255,3
24	GONZALEZ V-A, Miguel A	ESP	255,2
25	ZAHARIA, Sebastian Radu	ROU	249,1
26	POBYIPECH, Makar Jun	UKR	233,6
27	BJERAGER, Ole	DEN	232,3
28	SATEK, Samuel Jun	SVK	214,7
29	SATEK, Simon Jun	SVK	154,0
30	METKEMEIJER, Rob	NED	0

F2D World Champs Wloclawek Poland 2022

Place	Name	Country
1	FORSS, Jussi	FIN
2	RASTENIS, Audrius	WCh
3	DEMENTIEV, Igor	MDA
4	MATEO, Manuel	ESP
	MATEO, Raul	ESP
	SHIELDS, Andrew	GBR
7	BERTELSEN, André	DEN
	DEMENTIEVA, Natalia	DEN
	GRAVES, Russell	USA
	TOMAN, Dalibor	CZE
	VAZQUEZ, P-Z, Benjamin	ESP
12	CHORNY, Ivan Jun	UKR
	CHORNY, Stanislav	UKR
	KONIGSHOFER, Rudolf	AUT
	MAGZIANOV, Radik	USA
	REDIUK, Illia	UKR
16	KOCHUNTS, Vitaly	LAT
	KUCKAILIS, Gintaras	LTU
	RIMSA, Tomas Jun	LTU
	SEGARRA, Z-A, Xavier Jun	ESP
	SCHOU, Bjarne	DEN
	UMRYHIN, Andriy	UKR
	USALA, Antonio	BEL
	VASILEV, Mihael Jun	BUL
	WISEMAN, David	GBR
25	BUTNARI, Iurie Jun	MDA
	FORSS, Timo	FIN
	HORST, André	GER
	JALUNINS, Boris	LAT
	KOCUNCS, Eriks Jun	LAT
	LEINO, Laura	FIN
	MAYWALD, William	USA
	NIELSEN, Tobias Jun	DEN
	SCHWARZ, Johann	GER
	SNOZA, Tomas	CZE
	UNRUH, Rafael	GER
36	BUTNARI, Igor	MDA
	CANTATORE, Antonello	ITA
	DONCHEV, Lyubomir,	BUL
	GIJSBERTSEN, Bart Jun	NED
	GIJSBERTSEN, Bert	NED
	KUCERA, Pavel	CZE
	PLATKAUSKAS, Robertas	LTU
	PRICE, Gordon	GBR
	REDIUK, Liudmyla	UKR
	RIMSA, Vytautas	LTU
	THORUP, Kent	DEN
	VALKONEN, Kimmo	FIN
	VARDANYAN, Armen	ARM
	VARDANYAN, Sergey Jun	ARM
	VOSS, Leo	NED
	ZHELEV, Dimo, Z.	BUL



World Cup Herning

27th - 29th of May 2023



Friday: Arrival. Free training.
Saturday: Contest.
Sunday: Contest.
Monday: Diesel-combat.

World Cup: F2A-F2B-F2D.
Weatherman Vintage Speed, Minispeed, Beginner's Stunt, G/Y Racing, F2F, F2C.

Pre-registered pilots and info at
herningmodelflyveklub.dk



www.control-line.eu



Indonesian Nats in F2D was won by Erick Limanhadi with Benny Limanhadi on 2nd place and Ian Cahya Ismail on 3rd place.



Vid SM i Västerås hade Ove Andersson med sig sin nu färdigbyggda P51 Mustang och visade upp för oss andra. Trots att det bara är en semiskala-modell är likheten med en Mustang mycket slående. På sidan 13 i Lina 1-2020 finns en artikel om bygget för Er som vill veta mer.

F2C GBR World Cup Lugo 2022

Place, Name	Country	Best Q	Best S	Final
1 MAKARENKO/OSADCHII	UKR	3' 13,9	3' 13,3	6' 28,2
2 IGOSHYN/CHAYKA	UKR	3' 14,3	3' 14,6	119 laps
3 FEDAN/LESIUUK	POL	3' 15,4	3' 14,7	116 laps
4 GAUTHIER/VILLEBOEUF	FRA	3' 14,6	3' 18,7	
5 ORVOS/METKEMEYER	NED	3' 16,1	3' 19,1	
6 PIOTROWSKI/DZIKOWSKY	POL	3' 23,3	3' 20,3	
7 ZUKAUSKAS/SABLINSKAS	LIT	3' 21,0	3' 20,8	
8 ORLOVAS/CIBULSKAS	LIT	3' 25,0	3' 24,0	
9 SIMONS/GESCHWEDTNER	DEN	3' 16,4	69 laps	
10 VIRGILI/COCCHI	ITA	3' 27,4		
11 GOLISZ/LOSI	POL/ITA	3' 28,9		
12 PANCHENKO/CHAIIKA Jun	UKR	3' 29,6		
13 ANKER/OLJIVE	NED	3' 41,6		
14 MARASINI/SIGHINOLFI	ITA	3' 52,1		
15 De RIDDER/KRUIJFF	NED	4' 00,5		
16 GOLISZ/ZYLKA	POL	90 laps		

F2C ITA World Cup Lugo 2022

Place, Name	Country	Best Q	Best S	Final
1 SURUGUE/SURUGUE	FRA	3' 13,7	3' 15,5	6' 33,0
2 OUGEN/SURUGUE	FRA	3' 20,4	3' 14,3	6' 40,3
3 IGOSHYN/CHAYKA	UKR	3' 12,2	3' 14,7	DSQ
4 SIMONS/GESCHWEDTNER	DEN	3' 21,6	3' 20,0	
5 FEDAN/LESIUUK	POL	3' 22,3	3' 21,9	
6 PIOTROWSKI/DZIKOWSKY	POL	3' 17,9	3' 22,3	
7 GOLISZ/PERRET	POL/FRA	3' 21,7	3' 23,1	
8 ORVOS/METKEMEYER	NED	3' 17,0	3' 24,8	
9 ORLOVAS/CIBULSKAS	LIT	3' 26,1	36 laps	
10 MAKARENKO/OSADCHII	UKR	3' 15,6	DSQ	
11 GAUTHIER/VILLEBOEUF	FRA	3' 19,3	DNF	
12 ROSSI/VERRI	ITA	3' 23,0		
13 MOHAI/STRANIKA	HUN/AUT	3' 23,3		
14 VIRGILI/COCCHI	ITA	3' 27,3		
15 PEREZ/ALDECOA	ESP	3' 27,5		
16 GROSSI/LOSI	ITA	3' 27,6		
17 ALONSO/IGLESIAS	ITA	3' 29,5		
18 GOLISZ/ZYLKA	POL	3' 30,0		
19 ZUKAUSKAS/SABLINSKAS	LTU	3' 32,0		
20 ANKER/OLJIVE	NED	3' 35,8		
21 PANCHENKO/CHAIIKA	UKR	3' 37,8		
22 MARASINI/SIGHINOLFI	ITA	3' 38,0		
23 ANASTASI/LANZONI	ITA	3' 53,8		
24 De RIDDER/KRUIJFF	NED	70 laps		

F2C World Champs Wloclawek Poland 2022

Place, Name	Country	Best Q	Best S	Final
1 MAKARENKO/OSADCHII	UKR	3.11.9	3.12.7	6.30.8
2 SURUGUE/SURUGUE	FRA	3.10.0	3.09.9	6.39.6
3 SU/WEE	SIN	3.17.5	3.13.9	7.13.7
4 BONDARENKO/LERNER	UKR	3.12.6	3.15.8	
5 IGOSHYN/CHAYKA	UKR	3.13.3	3.16.4	
6 GAUTHIER/VILLEBOEUF	FRA	3.17.5	3.19.6	
7 GOLISZ/ZYLKA	POL	3.20.0	3.26.2	
8 ORLOVAS/CIBULSKAS	LTU	3.20.9	3.27.1	
9 SIMONS/GESCHWEDTNER	DEN	3.16.2	4.00.8	
10 OUGEN/SURUGUE	FRA	3.13.9	25 laps	
11 ORVOS/METKEMEYER	NED	3.21.6		
12 PIOTROWSKI/DZIKOWSKI	POL	3.21.8		
13 BRZEZINSKI/SZATECKI	POL	3.27.4		
14 PALEZHEV/HASAN Jun	BUL	3.28.3		
15 ROSSI/VERRI	ITA	3.29.7		
16 VIRGILI/COCCHI	ITA	3.35.3		
17 GLUSZEK/SOKOLOWSKI Jun	POL	3.41.1		
18 PANCHENKO/CHAIIKA Jun	UKR	3.41.3		
19 DE RIDDER/KRUIJFF	NED	3.43.6		
20 STOLL/LESIUUK Wom	POL	3.52.8		
21 ILIEV/MIHAYLOV Jun	BUL	4.07.4		
22 ZUKAUSKAS/SABLINSKAS	LTU	78 laps		
23 IVANOVA/IVANOVA Wom	BUL	74 laps		

F2B Italian Nats 2022

Place, Name	1	2	3	2 best
1 VALLIERA, Marco	1150.37	1163.13	1180.00	2343.13
2 MAGGI, Alberto	1052.03	1080.37	1069.10	2149.47
3 FELICI, Giacomo	966.10	1015.23	994.47	2009.70
4 FIUSSELLO, Mauro	981.20	979.43	1000.03	1981.23
5 ZENERE, Giorgio	981.10	984.10	988.30	1972.40
6 FURLAN, Vittorio	928.83	950.10	980.77	1930.87
7 MORANDIN, Roberto	927.03	931.50	988.83	1920.33
8 FIUSSELLO, Silvia	908.27	919.33	904.90	1827.60
9 FURLAN, Dionisio	892.93	923.80	896.17	1819.97

F2B GBR World Cup Lugo 2022

Place, Name	Country	2 best
1 GAUTHIER, Alexandre	FRA	2053.40
2 SOLOMIANIKOV, Sergii	UKR	2040.77
3 GAUTHIER, Philippe	FRA	1971.13
4 PIGOUT, Jacky	FRA	1929.60
5 BENES, Pavel	CZE	1905.90
6 LIBER, David	BEL	1858.90
7 MEISL, Kamil	CZE	1846.20
8 MORANDIN, Roberto	ITA	1818.20
9 SAUNIER, Thierry	FRA	1802.27
10 GAUTHIER, Baptiste	FRA	1721.40
11 ANKER, Bram	NED	1693.27
12 KAPPLER, Ulrich	GER	1604.76

F2B ITA World Cup Lugo 2022

Place, Name	Country	2 best
1 VALLIERA, Marco	ITA	2343.13
2 GAUTHIER, Alexandre	FRA	2241.57
3 SOLOMIANIKOV, Sergii	UKR	2222.37
4 MAGGI, Alberto	ITA	2149.47
5 MALILA, Lauri	SUI	2119.77
6 LIBER, David	BEL	2105.87
7 PIGOUT, Jacky	FRA	2071.37
8 BENES, Pavel	CZE	2053.90
9 GAUTHIER, Philippe	FRA	2050.23
10 FELICI, Giacomo	ITA	2009.70
11 FIUSSELLO, Mauro	ITA	1981.23
12 ZENERE, Giorgio	ITA	1972.40
13 DZIUBA, Pawel	POL	1931.67
14 FURLAN, Vittorio	ITA	1930.87
15 MORANDIN, Roberto	ITA	1920.33
16 GAUTHIER, Baptiste	FRA	1915.40
17 SAUNIER, Thierry	FRA	1895.40
18 FIUSSELLO, Silvia	ITA	1827.60
19 FURLAN, Dionisio	ITA	1819.97
20 GERMANN, Peter	SUI	1772.67
21 ANKER, Bram	NED	1757.67
22 RUSSBACH, Claude	SUI	1665.13
23 KAPPLER, Ulrich	GER	1654.83
24 MEISL, Kamil	CZE	0

F2C Warsaw World Cup Wloclawek Poland 2022

Place, Name	Country	Best Q	Best S	Final
1 ORVOS/METKEMEYER	NED	03:18,0	03:17,3	06:40,1
2 ZUKAUSKAS/SABLINSKAS	LTU	03:23,6	03:20,6	06:43,8
3 IGOSHYN/CHAYKA	UKR	03:14,8	03:16,6	83 laps
4 FEDAN/LESIUUK	POL	03:15,9	03:22,3	
5 MAKARENKO/OSADCHII	UKR	03:12,3	03:23,5	
6 ORLOVAS/CIBULSKAS	LTU	03:22,9	03:27,2	
7 OUGEN/SURUGUE	FRA	03:18,3	03:29,1	
8 PANCHENKO/CHAIIKA	UKR	03:32,0	03:35,9	
9 TOMCZYK/BECCALA	POL	03:23,7	03:41,0	
10 SU/WEE	SIN	03:25,1	03:47,0	
11 BARRAGAN/BARRAGAN	ESP	03:13,1	85 laps	
12 BAGLYOS/ROZBIEWSKI	HUN/POL	03:42,1		
13 MOHAI/STRANIKA	HUN/AUT	03:43,5		
14 GAUTHIER/VILLEBOEUF	FRA	03:46,6		
15 GOLEBIOWSKI/MAJEWSKI	POL	03:50,2		
16 GRYCMAN/ZIPZER	POL	04:05,4		
17 de RIDDER/KRUIJFF	NED	04:05,4		

F2A Warsaw World Cup Wloclawek Poland 2022

Place, Name	Country	Best
1 VALISHEV, Alexander	USA	305,4
2 BIELYKOV, Valerii	UKR	300,5
3 OSOVYK, Oleksandr	UKR	298,3
4 VALISHEV, Ivan Jun	USA	297,5
5 HUGHES, William	USA	297,4
6 STJARNESUND, Per	SWE	297,4
7 ROSTISLAVOV, Anthony	FRA	295,9
8 MIS, Artur	POL	294,7
9 GORDIYENKO, Oleksandr	UKR	293,9
10 SOBALA, Tomasz	POL	286,3
11 WALANIA, Kacper Jun	POL	286,1
12 AUBE, Jean Marc	FRA	285,9
13 PASTUREL, Remi	FRA	284,1
14 POBYIPECH, Makar Jun	UKR	279,2
15 SAMUELSSON, B-O	SWE	272,6
16 HEMPEL, Patrick	USA	271,3
17 POBYIPECH, Oleg	UKR	243,9
18 VALO, Jari	FIN	0
19 PASTYRIK, Pavel	CZE	0

F2D Warsaw WC Wloclawek Poland 2022

Place, Name	Country
1 REDIUUK, Illia	UKR
2 WISEMAN, David	GBR
3 RASTENIS, Audrius	LTU
4 PLATKAUSKAS, Robertas	LTU
5 TOMAN, Dalibor	CZE
6 SPATENKA, Radek	CZE
7 DEMENTIEV, Igor	MDA
7 SHIELDS, Andrew	GBR
7 VARFOLOMEJEV, Dmitri	EST
7 BUYANOV, Vladimir	GER
11 WELTER, Alexander	GER
11 SCHWARZ, Johann	GER
13 PRICE, Gordon	GBR
13 BUNKER, Alan	GBR
13 BUTNARI, Iurie, Jun	MDA
13 PINKERTON, James	GBR
13 UNRUH, Raphael	GER
13 KRAL, Milan	CZE
13 TUKUBAIEV, Igor	UKR

F2D GBR World Cup Lugo 2022

Place, Name	Country
1 Rediuuk, Illia	UKR
2 Chorny, Ivan JUN	UKR
3 Chorny, Stanislav	UKR
4 Bertelsen, Andre	DEN
Dementieva, Natalia	DEN
Tsukov, Sergei	EST
7 Friis-Nielsen, Morten	DEN
Ishchenko, Oleg	UKR
Molteni, Adriano	ITA
Vardanyan, Sergey JUN	ARM
Varfolomejev, Dmitri	EST
Anastasi, Maurizio	ITA
Giandrini, Antonio	ITA
Lysgaard, Steen	DEN
Platkauskas, Robertas	LTU
Thorup, Kent	DEN
Uzkhi, Sergey	UKR
18 Champain, Benoit	FRA
Horst, Andre	GER
Rastenis, Audrius	LTU
Riera, Xavier	FRA
Umryhin, Andriy	UKR
Unruh, Rafael	ARM
Vardanyan, Armen	GER
Villeboeuf, Thomas	FRA
26 Buyanov, Vladimir	GER
Cantatore, Antonello	ITA
Dutov, Alexandr	MDA
Maywald, William	USA
Moser, Maxim	GER
Osorhean, Andrei	ROU
Sbernadori, Giacomo	ITA
Umryhin, Malvii JUN	UKR
Welter, Alexander	GER
Zilberman, Volodymyr	GER

F2D ITA World Cup Lugo 2022

Place, Name	Country
1 Rediuuk, Illia	UKR
2 Chorny, Ivan JUN	UKR
3 Rastenis, Audrius	LTU
4 Chorny, Stanislav	UKR
Friis-Nielsen, Morten	DEN
Unruh, Rafael	GER
Bertelsen, Andre	DEN
Dementieva, Natalia	DEN
Giandrini, Antonio	ITA
Schou, Bjarne	DEN
Varfolomejev, Dmitri	EST
12 Buyanov, Vladimir	GER
Champain, Benoit	FRA
Lysgaard, Steen	DEN
Thorup, Kent	DEN
Tsukov, Sergei	EST
17 Anastasi, Maurizio	ITA
Platkauskas, Robertas	LTU
Podari, Ionut	ROU
Riera, Xavier	FRA
Vardanyan, Armen	ARM
Villeboeuf, Thomas	FRA
23 Dutov, Alexandr	MDA
Maywald, William	USA
Molteni, Adriano	ITA
Osorhean, Andrei	ROU
Sbernadori, Giacomo	ITA
Uzkhi, Sergey	UKR
Vardanyan, Sergey JUN	ARM
Wallner, Andreas	GER
Weiter, Alexander	GER
Zilberman, Volodymyr	GER

F2G GBR World Cup Lugo 2022

Place, Name	Country	Best
1 Daniel Rota	SUI	308,2
2 Guy Ducas	SUI	291,9

F2A ITA World Cup Lugo 2022

Place, Name	Country	Best
1 GROSSI, Luca	ITA	304,9
2 HALMAN, Peter	GBR	303,8
3 EISNER, Paul	GBR	302,8
4 HUGHES, William	USA	295,9
5 LYHNE-HANSEN, Niels	DEN	288,6
6 MAGGI, Alberto	ITA	218,4
7 PERRET, Matthieu	FRA	0

F2G ITA World Cup Lugo 2022

Place, nName	Country	Best
1 Ducas, Guy	SUI	300,0
2 Rota, Daniel	SUI	294,3
3 Perret, Matthieu	FRA	274,6
4 Stanojevich, Zane	SUI	260,2

F2A GBR World Cup Lugo 2022

Place, Name	Country	Best
1 HALMAN, Peter	GBR	303,1
2 EISNER, Paul	GBR	301,3
3 HUGHES, William	USA	300,2
4 LYHNE-HANSEN, Niels	DEN	290,6
7 PERRET, Matthieu	FRA	0

F2F ITA World Cup Lugo 2022

Place, Name	Country	Best	Final
1 MOHAI/STRANIKA	HUN/AUT	4.00,6	7.53,6
2 GOLISZ/STA-VICH	POL/SUI	3.51,0	8.04,6
3 RIDDER/KRUIJFF	NED	3.55,3	8.08,6
4 ORVOS/M-MEYER	NED	4.01,7	

F2B Warsaw World Cup Wloclawek Poland 2022

Place, Name	Country	2 best
1 HERNANDEZ, Orestes	USA	2188,33
2 BURGER, Igor	SVK	2185,22
3 KRAVCIK, Zbynek	CZE	2116,96
4 SOLOMIANIKOV, Sergii	UKR	2107,52
5 WADLE, Frank	GER	2089,39
6 SCHREK, Alexander	SVK	2077,73
7 BAJAIKINE, Konstantin	CAN	2059,26
8 CHAPOULAUD, Nicolas	FRA	2033,83
9 DALY, Joseph	USA	2023,86
10 GAUTHIER, Philippe	FRA	2002,96
11 LIBER, David	BEL	1995,06
12 RADOS, Roman	CZE	1992,76
13 DOLOBAC, Patrik Jun	SVK	1987,73
14 HOLTERMAN, Christoph	GER	1986,43
15 RUSH, Howard	USA	1980,63
16 NIEŚCIORUK, Marek	POL	1979,36
17 TOMZIK, Robert	POL	1973,29
18 PIGOUT, Jacky	FRA	1960,23
19 VASILIAUSKAS, A-tas	LTU	1952,93
20 MOROSANU, T Dorin	ROU	1943,53
21 LOFROTH, Niklas	SWE	1918,36
22 GASPARD, Jakob Jun	SVK	1910,03
23 MORBITZER, Dietmar	GER	1847,89
24 DALY, Steven Jun	USA	1828,66
25 HELLSÉN, Anders		

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