

INDOOR
NEWS and VIEWS
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Ralph C. Wilson Jr. Fieldhouse, Buffalo, New York

From The Editor's Desk

You'll notice on the cover that we now have a new dating format. In keeping with the quarterly publication initiative, our issues will be denoted Spring, Summer, Fall, and Winter, unless someone has a better idea. Also, there will be a timely issue coming out for each of these quarterly periods, honest. We will try for 40 pages, since Tim and I both feel that is a nice size, but I won't hesitate to reduce that if publication time comes around.

You will also notice the Buffalo Bill's Fieldhouse on the cover. The spring and summer issues of INAV have been full of winter and spring contests, and a steady supply of plans and articles (Thank you, thank you). So in the past year we left out both the 2003 and 2004 annual Empire State Indoor Championships held in Orchard Park, NY, but include photos in this issue. This great site has a 200 by 400 foot floor and is 128 feet high. Robert Clemens is the organizer, and has said that, "This is the best kept indoor site secret going."

Since many, many of you are involved in Science Olympiad and TSA mentoring efforts, we feature several articles on SO by Ray Harlan, whose reputation and supply house need no introduction.

- Carl Bakay

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Indoor News and Views is an open forum presenting ideas, opinions, model designs and techniques for the indoor community. Unless specifically stated, INAV does not offer any opinion as to the merit of published work, nor does it endorse any products or services advertised herein.

Sample ad copy should be sent to Tim Goldstein at the above address for publishing details.

PUBLISHERS DESK:

A few housekeeping items. First, a change in the frequency of INAV. Due to the changes in my employment situation, INAV is now having to pay the full commercial rate for printing. This has increased the costs to produce this publication by about \$2000/year. The choice is either to raise the rates or to switch to a 4 times per year schedule. Because I am sure you are all tired of the rate going up, we will be switching to 4 issues/year.

Next up is subscription expirations. To keep costs and workload for the volunteer staff low, we do not mail out reminders. If you look at the mailing label next to your name you will see the month and year your subscription expires. When you are mailed your final issue before your expiration, we highlight this date in yellow. This is your only notice. If you are not sure when your subscription is up, just look at your label and be sure to renew before the date printed there so you don't miss any issues. An interesting trend in subscriptions I am noticing. Our USA subscriber base is shrinking and our non-USA subscriber list is growing. Many subscribers particularly over seas are finding the ability to subscribe or renew on the web with PayPal or a credit card to be very convenient. This seems to be driving the increase in non-USA subscribers. Now, we need to do something to start increasing our USA subscriber base. Our best idea so far is to turn to our current subscribers and ask you to please recommend INAV to anyone you know that is interested in indoor FF.

There is very interesting new web forum at www.SmallFlyingArts.com Due to the efforts of Bill Carney we now have an indoor FF section on the group. While I am a happy subscriber of the Indoor list on Yahoogroups, this new site offers a great format that lets you post pictures with the text. An even bigger benefit is that there are many people using this forum that are not currently indoor fliers, but are stopping by to check us out and see what this sport is all about. I would suggest stopping by and checking it out.

Tim

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THE RETURN OF THE KING!

THE 2004 F1D INDOOR WORLD CHAMPIONSHIPS. SLANIC. ROMANIA. OCTOBER 4TH TO THE 9TH.

For the second time in two years, I travelled back to the saltmine, this time dubbed 'Wing Commander', as the GB F1D Team Manager for Bob Bailey, Ron Green and Derek Richards. Arch indoor enthusiasts Geoffrey Lefever and Clive King ably supported the squadron and Bryan Stichbury (making a heroic second tour of duty as a timekeeper) completed the party.

Travel was largely uneventful. Tarom again provided excellent flights with no problems about taking model boxes onboard and the use of two hire cars from Hertz was convenient. This time we used the SkyGate hotel next to Bucharest airport at either end of the trip and this was a comfortable alternative to the cheap but dismal accommodation in the city center that we suffered last time. The only excitement en route to Slanic came just after Ploesti, when we missed a turning and spent several hours examining delightfully picturesque parts of rural Romania that seemed to have disappeared off the map! After fording a river we got back on the road and arrived in time for an afternoon's flying before the official practice day.

The hotel seemed more dilapidated, the water was still brown and the feral dogs just as plentiful, but after checking-in, unpacking the model boxes and our priceless electric kettles, biscuits and provisions for afternoon tea (alas, no cucumber sandwiches), we girded our loins and took the rickety lift into the stygian gloom of the mine.

Preparations for the contest were well underway, several teams were ahead of us, and friendships were quickly made or renewed before flying began. I was particularly intrigued to find out what type of props flyers would use, VP or FP and during practice several contestants tried VP props - with a variety of results. Ron green used a simple hub, longer than normal with actuator wires placed directly into the wood. This arrangement relied on the wood itself to provide the spring. Ron had several of these with wood of various densities. Bob Bailey used a more complex arrangement with the shaft above the driver arm being a secondary spring and made of thicker (0.016/0.017") wire.

I believe that most that had some flew with May '99 rubber, although Bob Bailey opted to use March '02. Ron and Derek had little trouble with May '99 this time and it may be well suited to the cool mine conditions. During final preparations before leaving, Ron was cutting from one batch of May '99 and suddenly found it de-laminating...no doubt this sounds familiar to others!

The next day, during official practice, the remaining entrants arrived and anticipation increased as everyone tried to get to grips with the unique conditions. After a brief official opening ceremony, everyone retired to the hotel to finalize cunning plans for the first two contest rounds.

There was little in the way of new technical developments. Steve Brown and Jim Richmond both brought some longer models than last time – Jim had one reputed to be 36" long, although I didn't see him use it in the contest. Apart from Jim, most of the top placing flyers used flat tailplanes and fins rather than the standard GB arrangement of tip-dihedral tails on fairly long posts. German flyers Lutz Schramm and Marian Krause had some models with curved dihedral wings and Lutz used a truly elliptical layout rather than a gentle arc. He brought 2 of these models to earlier testing sessions in the Millenium Dome and explained their complex construction to me there. The German fascination with elliptical dihedral extends all the way back to Max Hacklinger and Karl-Heinze Rieke at the first ever F1D World Championships at Cardington in 1961 and 1962. I didn't hear of anyone suffering major damage during transit and model box construction and packing remains an art. There were several beautiful and tightly packed boxes on display – Jonas Romblad from Sweden had a particularly neat example that was as finely engineered as his torque-meter and winder.

The unofficial aerobatics contest produced some splendid (if unintentional) manoeuvres, caused by high torque launches and structures that weren't stiff enough. The unanimous winner was a Polish junior flyer who executed a perfect and spectacular loop with the tailplane spars distorting into a complete circle with almost touching tips. After this excellent contortion, the tail flipped back to normal and the model climbed away while the builder bowed to much spontaneous applause.

The top times were almost identical to those last time, although there was much less of a gap to second place and the top individual flyers were much closer together. I believe that people flew harder than in 2002 and recognized that in order to achieve long times, it was necessary to ceiling-scrub. There were certainly more hang-ups than in 2002 and a certain amount of luck was needed to escape this grisly fate. Jim Richmond's longest flight seemed to me to spend about 5 minutes on the ceiling in perfect position at the intersection in the mine and there were several heroic feats of very high altitude steering - notably from Bob Bailey and Dezso Orsovai. Several others were less fortunate and in the final round, Ron Green hung on the outside of the catwalk and Derek Richards hit the wall very high up in an unsteerable position. Had either of these flights survived, GB would have been amongst the medals.

At the end of the contest, the maestro Jim Richmond had taken Gold yet again for the 8th time. Lutz Schramm was second and Dezso Orsovai third. The longest flight of the meeting went to John Kagan flying a variation of his 'Eidolon' design. His time of 36:02 was the result of a re-fly in superb air at the close of play on the first day – his first attempt was slightly longer, but the rubber had dropped off at a late stage in descent and nobody spotted this in the gloom. Team honours went to Romania, with the USA second and Hungary eventually edging out GB for Bronze by 22 seconds.

For the second time, Doug Schaefer won the junior Gold medal, although he probably failed to reach his full potential due to a brief bout of illness during the second contest day. His first two flights were both 30+ and enough to secure first place by around 7 minutes. The Silver went to the USA's Brett Sanborn and Bronze to Aurel Simpetrean from Romania. The USA juniors also took top Team honours, a great achievement, as I believe that two of them have not been flying F1D for long. Romania took the Silver and Poland the Bronze, with both teams continuing the tradition of high-level junior competition from Eastern Europe.

Surprisingly, there were 5 more senior contestants than last time (36), but one less junior (13). 10 full senior teams were present along with 4 full junior squads and this time, there was no senior representation from Switzerland or Spain, although full teams arrived from France and Italy and Sweden and Serbia & Montenegro were also represented. In the junior team contest, there were full teams again from the USA, Romania, Poland and Lithuania, but no flyers from Hungary or the Ukraine – one junior from Serbia & Montenegro balanced this.

The air was certainly not consistent, although flying at the start or end of the mornings/afternoons probably gave better conditions. There were quite a lot of visitors during the contest and lift activity may have had an effect on air stability. I'm sure the addition of two 'Portaloos' was a great relief to many! but unfortunately, the model set-up area still resembles a cattle market and is a long way from the flying area. The processing and weighing facilities are still very unsatisfactory and placed in a position that creates a human bottleneck right at the entrance to the flying area. Surely a way can be found to rethink, expand and relocate these facilities. Policing of the number of bodies in the flying area was well controlled and the human presence mostly kept to a minimum.

After several days of extremely stressful competition, Rob Romash, indoor's leading children's entertainer, magician, top flyer and USA Team Manager added a fine touch of humour as we queued for the final lift by staging a multiple high level release of tiny gliders.

Overall, the contest was undoubtedly a great success and Marius Conu in particular deserves especial thanks. All involved with organization are to be congratulated on staging another fine Championships. The banquet was a relaxing and convivial affair and for many, thoughts will now turn to the planned European Championships in Bordeaux – a completely different site with different problems. The next World Championships have already been provisionally given to Romania and the mine. So, the show rolls on! I hope to see you all soon.

Nick Aikman. 20.10.04.

(Hey, check out Nick's new site at <http://groups.msn.com/INDOORDURATIONMODELSGB>
It is about the European scene, but indoor modelers worldwide are invited. – Ed.)

FAI World Championship Indoor F1D 2004

Slanic Prahova, Romania from October 4 to 9

Flight times are given for each of the 6 rounds in 'min.sec' form. Note that * indicates the best time recorded, + marks the second best time, together these add to give the contest time given in the right hand column

Individual results

1	James Richmond	W/C	1.15	11.56	36.00*	35.19+	33.57	32.42	71.19
2	Lutz Schramm	GER	35.16*	24.48	32.20	9.28	33.50+	10.33	69.06
3	Dezso Orsovai	HUN	24.10	33.58+	32.54	33.29	33.20	34.28*	68.26
4	John Kagan	USA	32.19+	36.02*	31.18	31.50	31.19	30.48	68.21
5	Corneliu Mangalea	ROM	33.26*	32.55	31.30	32.59+	31.27	32.23	66.25
6	Aurel Popa	ROM	34.24*	1.24	32.01+	22.17	8.13	9.12	66.25
7	Fred Tellier	CAN	24.35	28.40	29.45	29.49	33.02*	30.06+	63.08
8	Tom Sova	USA	31.12*	30.10	19.33	31.06+	30.30	30.27	62.18
9	Oleksandr Kovalyov	UKR	27.06	32.20*	29.13	25.50	29.37+	2.44	61.57
10	Bob Bailey	GBR	31.07*	29.27	30.09	27.45	30.26+	29.10	61.33
11	Jonas Romblad	SWE	27.08	26.13	30.31+	11.44	28.44	30.53*	61.24
12	Ron Green	GBR	1.06	29.00	29.30	30.38*	30.28+	4.54	61.06
13	Andras Ree	HUN	29.19+	28.47	28.45	16.43	30.37*	28.06	59.56
14	Karl Schoenfelder	GER	25.16	30.55*	28.51+	10.45	22.15	25.49	59.46
15	Steve Brown	USA	29.38+	2.26	25.02	27.21	29.51*	26.17	59.29
16	Derek Richards	GBR	28.45+	25.58	21.52	24.16	30.14*	11.30	58.59
17	Thierry Marilier	FRA	30.26*	25.05	9.41	27.17	28.25+	24.42	58.51
18	Dan Amoraritei	ROM	27.42+	10.55	24.30	8.58	6.11	31.08*	58.50
19	Oleh Korniychuk	UKR	24.33	19.35	24.17	28.47+	11.51	29.40*	58.27
20	Sergiy Mosolov	UKR	20.06	20.00	22.01	28.41+	28.30	29.12*	57.53
21	Istvan Botos	HUN	24.52	22.03	21.00	22.58	28.35*	25.03+	53.38
22	Fabio Manieri	ITA	21.29	24.04	1.56	24.41+	28.28*	24.41	53.09
23	Didier Barberis	FRA	0.00	27.02*	23.11	25.58	26.03+	23.47	53.05
24	Robert Champion	FRA	25.08	21.49	24.01	24.38	26.53*	25.59+	52.52
25	Jan Dihm	POL	25.08	25.33	25.57	25.58+	26.53*	25.23	52.51
26	Jerzy Markiewicz	POL	22.43	22.49	25.32+	22.02	27.06*	19.24	52.38
27	Slobodan Midic	SCG	26.38*	24.56	23.11	22.12	16.57	25.33+	52.11
28	Edward Ciapala	POL	23.07	25.32*	0.00	22.07	23.20	23.26+	48.58
29	Peter Olshefsky	CAN	22.00	22.03+	17.43	0.57	24.41*	7.02	46.44
30	Marian Krause	GER	19.37+	26.45*	9.13	7.25	16.46	14.13	46.22
31	Yasutaka Tanaka	JPN	19.59+	0.23	25.24*	16.52	0.23	16.28	45.23
32	Giacomo De Angelini	ITA	9.52	13.44	19.30+	21.05*	0.09	0.00	40.35
33	Vojslav Stojkovic	SCG	7.03	0.06	16.03	16.25+	7.45	21.58*	38.23
34	Raymond-Jones Colin	CAN	18.40*	18.00+	16.15	13.40	16.47	17.37	36.40
35	Hideyo Enomoto	JPN	15.05	15.21+	14.38	13.31	13.30	19.53*	35.14
36	Mario Gialanella	ITA	14.00	10.03	13.02	14.24+	13.33	19.25*	33.49

Team Results

	Country	Abbrev	Total	Round-by-round places					
1	Romania	ROM	191.40	1	7	1	2	2	1
2	USA	USA	190.08	2	3	2	1	1	2
3	Hungary	HUN	182.00	4	1	5	5	4	3
4	Great Britain	GBR	181.38	8	4	3	3	3	4
5	Ukraine	UKR	178.17	5	6	7	6	6	5
6	Germany	GER	175.14	3	2	4	4	5	6
7	France	FRA	164.48	9	9	6	7	7	7
8	Poland	POL	154.27	6	5	8	8	8	8

9	Canada	CAN	146.32	7	8	9	9	9	9
10	Italy	ITA	127.33	10	10	10	10	10	10
11	Serbia and Montenegro	SCG	90.34	12	11	12	11	11	11
12	Japan	JPN	80.37	11	13	11	12	12	12
13	Sweden	SWE	61.24	13	12	13	13	13	13

FAI Junior World Championship Indoor F1D 2004

Individual results

1	Doug Schaefer	USA	31.21*	30.54+	27.34	0.00	26.53	0.10	62.15
2	Brett Sanborn	USA	20.47	10.12	22.04	28.18*	27.08+	1.16	55.26
3	Aurel Simpetrean	ROM	27.14*	23.43	24.00	24.43+	1.19	14.18	51.57
4	David Rigotti Jr	USA	23.50	22.21	23.21	26.19*	23.01	24.40+	50.59
5	Krystian Kwieciak	POL	19.01	13.10	20.07	23.33+	23.52*	13.29	47.25
6	Viorel Pop Dan	ROM	20.38	20.36	21.27+	21.08	22.15*	19.11	43.42
7	Juozapas Cybas	LTU	19.42	21.08+	16.35	16.40	21.57*	15.10	43.05
8	Vilius Steponenas	LTU	19.34	16.24	21.26*	17.55	0.00	20.55+	42.21
9	Tomasz Demidowicz	POL	7.05	15.07	11.37	25.36*	16.33+	13.42	42.09
10	Zoltan Somodi	ROM	19.03	20.26*	19.16+	18.46	12.18	13.35	39.42
11	Lukas Ivanauskas	LTU	16.12	13.55	17.00	18.55+	18.35	20.41*	39.36
12	Karol Misiarz	POL	18.50+	18.08	19.02*	17.48	15.43	16.21	37.52
13	Stefan Pavelka	SCG	8.14	0.00	1.13	8.31	11.58*	11.51+	23.49

Team Results

	Country	Abbrev	Total	Round-by-round places					
1	USA	USA	168.40	1	1	1	1	1	1
2	Romania	ROM	135.21	2	2	2	2	2	2
3	Poland	POL	127.26	4	4	4	3	3	3
4	Lithuania	LTU	125.02	3	3	3	4	4	4
5	Serbia and Montenegro	SCG	23.49	5	5	5	5	5	5

These pages courtesy of, and with permission of, Ian Kaynes, FAI webmaster.



L to R: Dave Rigotti, Tom Sova, Doug Schaefer, Bret Sanborn, Jim Richmond, Steve Brown, John Kagan

KIBBIE DOME 2004 RESULTS

Hand Launched Stick

Bruce Kimball	27:52	1
Earl Hoffman	22:16	2

Intermediate Stick

Mike Palrang	29:34	1
Earl Hoffman	25:40	2
Michael Thompson	22:52	3

F1D Junior

Tim Chang	20:07, 18:24 - 38:31	1
Anjaney Kottapalli	17:44, 18:41 - 35:85	2

F1D Open

Steve Brown	29:50, 30:15 - 59:65	1
Bruce Kimball	28:37, 30:05 - 58:42	2
Cezar Banks	26:15, 27:13 - 53:28	3

Eazy "B"

Mike Palrang	28:24	1
Bruce Kimball	25:48	2
Andrew Tagliafico	23:37	3

Penny Plane

Michael Thompson	14:24	1
Tim Chang	12:20	2
Tem Johnson	11:41	3

Limited Penny Plane

Jerry Powell	14:08	1
Cezar Banks	13:38	2
Ed Berray	13:03	3

R.O.G. Stick

Andrew Tagliafico	19:29	1
Ed Berray	16:22	2
Chris Doughty	12:24	3

Bostonian

Emil Schutzell	5:05	1
Jerry Powell	4:00	2
Dave Haught	1:45	3

Mini-Stick

Gary Hodson	12:52	1
Emil Schutzell	11:55	2
Mike Palrang	11:52	3

1.2 Eazy "B"

Jerry Powell	19:55, 20:39 - 40:34	1
A. Tagliafico	20:12, 19:36 - 39:48	2
Mike Palrang	20:01, 19:44 - 39:45	3

Hand Launched Glider

Michael Thompson	60.2, 61.4 - 121.6	1
Bruce Kimball	56.0, 55.4 - 111.4	2
Ed Berray	41.6, 41.8 - 83.4	3

Catapult glider

Tem Johnson	84.2, 83.8 - 168.0	1
Bruce Kimball	74.0, 72.0 - 146.0	2
Ed Berray	69.0, 71.1 - 140.1	3

Unlimited Catapult Glider

Tem Johnson	83.1, 84.0 - 167.1	1
Ed Berray	71.1, 73.6 - 144.7	2
Mike Thompson	70.6, 72.0 - 142.6	3

S.O. Junior

Ocea Nigito	12:55	1
Julia Patterson	4:23	2
Rebekah Altig	4:06	3

S.O. Senior

Chris Borland	7:25	1
Cezar Banks	7:17	2
Andrew Tagliafico	7:15	3

S.O. Mass Launch

Chris Borland	7:23	1
Andrew Tagliafico	6:58	2
Ed Berray	5:04	3

A-6

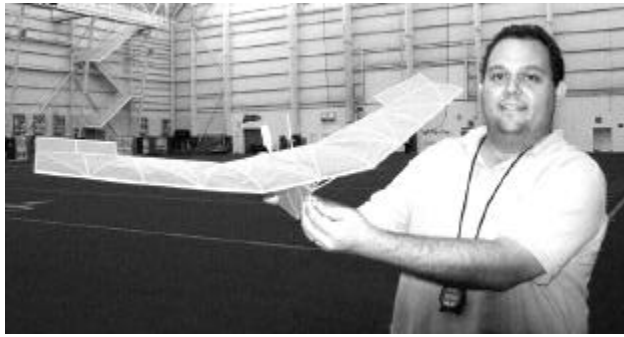
Gary Hodson	10:13	1
Emil Schutzell	9:46	2
Tem Johnson	9:19	3

Manhattan

Emil Schutzell	11:48	1
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Flying in the Buffalo Bill's Fieldhouse, Buffalo, New York

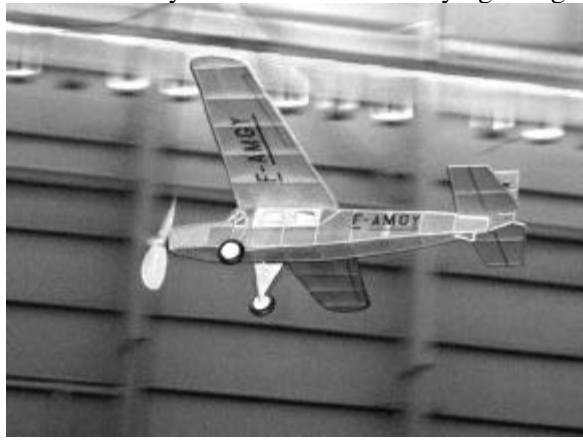
Photos by Bob Clemens, robert.clemens@worldnet.att.net



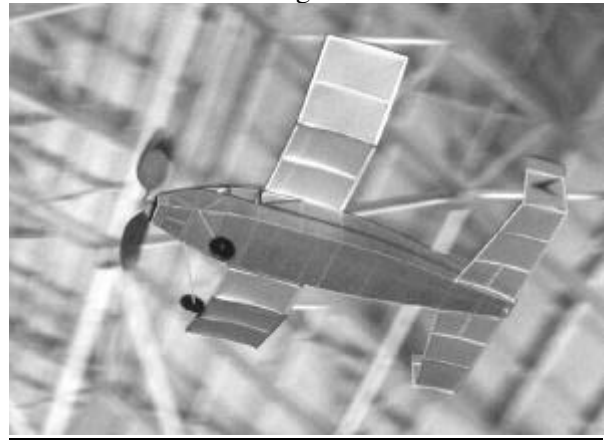
Don Slusarczyk with Electric FF Flying Wing



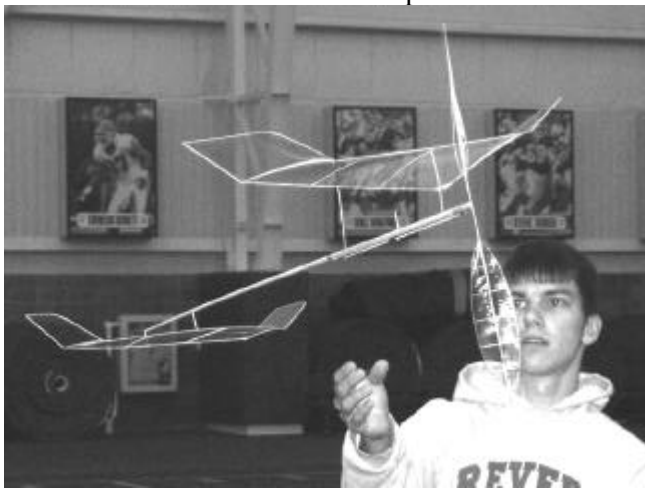
Golden Age Finalists



Farman 400 Monoplane



Don Steeb's Bostonian



Wilcox Launches his F1D



Fred Tellier Winding

Basic Glider Physics - Wash-out

By Kurt Krempetz - 8/04

Introduction

When discussing glider designs whether indoor or outdoor, Hand Launch Gliders (HLG) or Catapult Launch Gliders (CLG) the subject of wash-out is typically brought up. Washout is typically thought of as twisting, shaping/sanding or adding an up tab to the trailing edge of the tips of a wing, so wing tips at a negative angle of attack compared to the root of the wing. It is believed wash-out is desirable because its thought the tips stall first and putting the tips negative compare to the rest of the wing prevents this for happening. One can view the typically Lift Coefficient vs. Angle of Attack graph to understand why this theory is believed true. Also, it is important that both wingtips are wash-out equally otherwise a roll or aileron effect is created. Yaw makes the wash-out issues even more complicated, so to keep things simple the assumption of the wing flying level, no yaw is made.

Currently there are two methods typically used in glider design to add wash-out to a wing. One is the typical way of shaping/sanding the wingtips. The other is to cut the dihedral joint skew to the centerline of the wing.

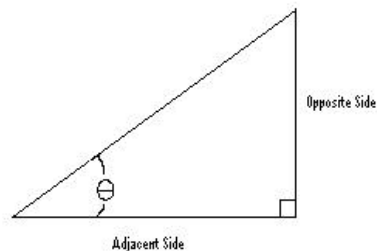
Typical Wash-out Method

For year's wash-out appeared in many glider designs. Bending or sanding the wingtips at the trailing edge up typically about 1/16", added wash-out. This was thought to improve the glide of the model along with the transition from launch velocities to glide velocities. The disadvantages of wash-out are added drag, and the possible added roll to the model. Bending tabs on any flying surface is thought to be very velocity dependent. This means the characteristics of the model will change dramatically with velocity. Since gliders go through a large range of velocities this is thought to be a concern. Also at high velocities the concern of the up tab bending or flexing is an issue. When parts of a glider flex /bend or the model is velocity dependent, the trimming of the model becomes very difficult.

To quantify the wash-out using this typical washout method it was decided that the change in angle of attack is the parameter of most interest. To calculate this change in angle of attack some trigonometry was applied.

The tangent function is defined as:

$$\tan \theta = \text{Opposite} / \text{Adjacent}$$



To calculate the wash-out in terms of angle of attack, set a reference line that passes thru the front point of the leading edge and trailing edge of the normal airfoil. Then set a line that passes thru the front point of the leading edge and trailing edge where the trailing edge has washed up. Calculate the angle between these two lines.

$$\tan \theta = \text{height washed up (H)} / \text{wing chord at this location (Wc)}$$

$$\text{Or: } \theta = \text{Arctan}(H/Wc)$$

The following dimensions are taken from Super Sweep plans. To get an average angle of attack the dimensions were taken at the midpoint between the dihedral joint and the end of the wing.

$$\text{Up tab} = \frac{1}{16}''$$

$$\text{Wing Chord at wingtip locations} = 2''$$

Therefore the change in angle of attack is:

$$\theta = \text{Arctan}(.0625/2)$$

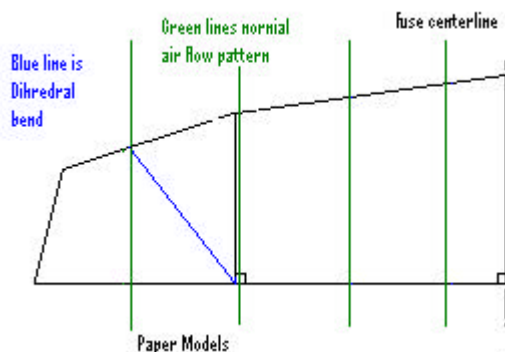
or doing the math

$$\theta = 1.79^\circ$$

Now this is an approximation since wings are typically tapered or some other interesting elliptical shape. The angle of attack typically decreases as you move to the tip of the wing; this is not a constant number using the typical washout method. Still an approximation is better than nothing and some numbers are needed so intelligent design choices can be made.

The Dihedral Wash-out Method

Recently, the last 30 years, many glider designs cut the dihedral joint (poly-dihedral designs, outer dihedral joints only) skew to the centerline of the wing. Ron Whitman's Super Sweep model had this feature, but its unknown whether he originated this idea. After spending many hours talking to some great modelers about this subject it been concluded cutting the dihedral skew to the centerline of the wing can add wash-out or wash-in. Some paper models best illustrate the concept.

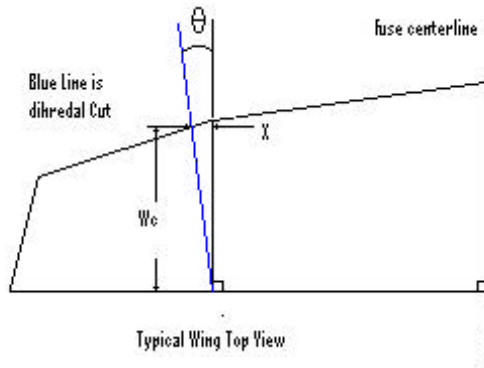


Take two pieces of paper, which is stiff enough to hold some shape. With a pen put lines on the paper, which is parallel to the centerline of the wing/fuse. This is basically the way the air flows across the wing when the wing is flying level and there is no yaw (This assumes a 2D model with no circulation around the wingtips). With one piece, bend in dihedral with the dihedral joint parallel to the centerline of the wing, the second piece put a skew angle outward (45 degrees). Now lay these pieces of paper on a flat board and measure the height from the paper to the board at both the leading and trailing at each of the pen lines.

Since the paper is lying flat on the board these measurements are 0 for both the leading and trailing edge until you get to the dihedral joint. Then note what happens. For the one with the dihedral joint that is parallel to the centerline of the wing/fuse, the height changes as you measure to the tip but the height of the trailing edge and leading edge are equal at each pen line. The angle of attack of the wingtip has not changed compared to the rest of the wing. Now measure the one with the dihedral joint pointing outward, like the Super Sweep design. After the dihedral joint the leading edge height is smaller than the trailing edge height at a specific pen line, essentially putting the tip negative compared to the rest of the wing. From this it can be concluded the wing has been wash-out.

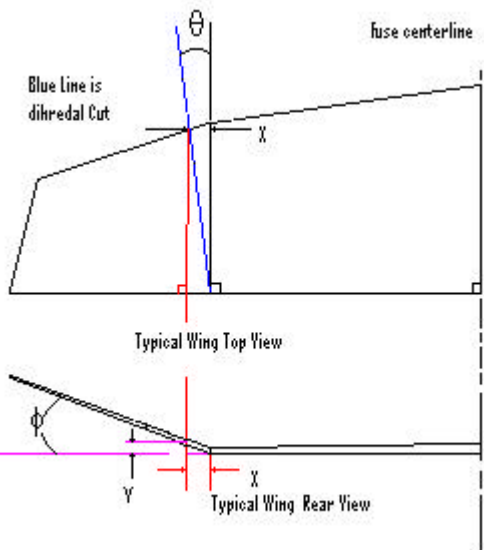
The advantages of adding wash-out by this method is it eliminates many of the disadvantages mentioned with adding wash-out the typical way. The disadvantage of wash-out using this method is that the whole tip is at the same angle of attack, where with the typically wash-out method the angle of attack decrease as you move out further on the tip.

Again to quantify the wash-out using this dihedral wash-out method it been decided that the change in angle of attack is the parameter of most interest. To calculate this change in angle of attack you need to apply some trigonometry.



Most plans do not give the angle, just the Distance off of the dihedral joint, which is parallel to the centerline of the wing (X).

$$\tan \theta = \frac{\text{Distance off of the dihedral joint (X)}}{\text{Wing Chord (Wc)}}$$



Now, $\tan \phi = Y/X$ Where ϕ is equal to the dihedral angle

Substituting in for X where $X = \tan \theta * Wc$ and solving for Y the following equations is derived:

$$Y = \tan \phi * (\tan \theta * Wc)$$



Now to calculate the angle of attack

$$\tan \psi = Y/Wc$$

Substitute in for Y; $Y = \tan \phi * (\tan \theta * Wc)$ and Solving for ψ

$$\psi = \arctan (\tan \phi * \tan \theta)$$

Again the following dimensions are taken from Super Sweep plans

$$X = 1/16''$$

$$\text{Wing Chord (Wc)} = 2.945''$$

$$\text{Dihedral angle} = 17 \text{ degrees (1.25'' high tip)}$$

The skew angle for the dihedral cut is

$$\tan \theta = .0625/2.945 = .02122$$

Therefore the change in angle of attack is:

$$\Psi = \text{Arctan}(\tan 17^\circ .02122) \quad \text{or} \quad \Psi = .37^\circ$$

Conclusions

The issue whether a good glider design should have wash-out in a wing is still not understood or settled. What is clear is there are at least two ways to create wash-out in a wing. The two methods were described both offer some advantages and disadvantages.

Plastic Films and How to Cover With Them

By Ray Harlan, Wayland, MA

Now that plastic films are permitted in the Wright Stuff events, there need no longer be the frustration over tissue coverings shrinking in dry conditions or having to cover wings in three pieces or cutting wood outlines while trying to trim excess paper. Plastic films are perfectly stable, easy to work with and can be lighter than tissue. It is very important to choose the right kind of covering because there is a wide range of choices. Some are too heavy and others are much too light and fragile. In the table below, the first three are too light. Two are no longer available, but their successor, SO film, is too fragile and has a very high dielectric constant, so it gets full of static electricity unless the humidity is above 50%. PPP film is better, but still a bit fragile for these models. The .9 and 1.4 micron films probably are the best choices; they are easy to work with and are strong, but light. The previous standard WS covering, Japanese Tissue is at least 5 times heavier than these films. The thinnest films might save you 0.2 gram over the 1.4 micron film, but are so difficult to work with that they definitely are not worth using. Besides, they are very expensive. Some heavier films can be used, but they become stiffer and harder to use. Two films that are commonly available locally, dry cleaner bags and produce bags from supermarkets, are not included in the table because they are variable in thickness, depending on the supplier. They may be perfectly usable, but need their densities measured before trying them.

Product	Thickness um	Density g/m2	Source	Colors
Y2K2	0.3	0.54	No longer available	bright yellow, blue
Y2K	0.5	0.7	No longer available	bright red, green, blue
O-S Film	0.5	0.8	Tim Goldstein	bright red, green
PPP Film	0.7	0.9	Roy White	clear
Super Ultrafilm, Polymicro	0.9	1.2	Ray Harlan, Indoor Model Supply, Micro X	streaky med. red, green blue
Ultrafilm	1.4	2.2	Ray Harlan, Indoor Model Supply, Micro X, Model Research Labs, Tim Goldstein	very dull red, green; almost clear
2um Clear Mylar	2	3.1	WES-Technik, David Lewis	clear
.012 oz Condenser Paper	?	5.3	Ray Harlan, Indoor Model Supply	translucent off-white
Gampi Paper	?	6.4 to 9.4	Campbell Model Supply, specialty art stores	opaque off-white
.020 oz Condenser Paper	?	8.8	Indoor Model Supply	translucent off-white
5um Clear Mylar	5	7.1	WES-Technik, David Lewis	clear
Esaki Tissue	?	11	FAI Model Supply, Campbell Model Supply, Micro X	solid colors
Saran Wrap	?	20	Grocery stores	clear

Attaching films is easy with a spray cement. With proper care, they can provide a lighter, more uniform adhesive for films than any brushed-on coating. Brushed-on adhesives are difficult to control and take much longer to apply. One of the best features of spray cement is that it allows repositioning of the film if a mistake is made while covering. The greatest thing about films is that you can cover the wing flat and add dihedral later.

The first step is to choose the right product. Many spray cements (such as 3-M's Spray-Ment) produce a cream-colored lacy pattern that is too heavy and is not uniform. Much more suitable are 3-M's Super-77 or 75, and Grumbacher- 548 with fine, transparent sprays. The Super 77 is a high-tack adhesive that now comes with an extra fan-spray nozzle ideal for indoor models. For the lightest covering, the Super 75 is best. It has a lower but more than adequate tack, and is formulated for temporary bonds. The air loads on indoor models is so low that this adhesive is essentially permanent. Grumbacher-584 sprays uniformly, has moderate tack, but is heavier than Super-75. It has an orange tint that makes it easier to see.

When setting up to cover a model, it is very smart to spray the model frames outdoors. This is the safest and least messy way to do the job. The cement will stay tacky for a very long time, so rushing back to the building board isn't a priority. If you must spray indoors, do it only in a garage and be sure it is well ventilated. This means fresh-air circulation (i.e. open windows). Also, cover the floor where you will spray with lots of newspaper, at least ten feet square.

To help see where you are spraying, try this: shine a flashlight horizontally across the spray zone a few inches above the floor. Turn out all other lights (or spray outdoors at night) when you spray. The aerosol droplets will reflect light from the flashlight so you can see them more easily. This is a good way to estimate how much cement you are applying, and where. A black plastic background also helps you see the droplets and can be cleaned with paint thinner.

The Spray cement is applied to the convex side of the ribs (top of the wing or stabilizer) only. Use just one pass on a narrow wing, and no more than two on a wider wing (one each for the leading and trailing edges). For Super-75 and Grumbacher-548, hold the can 12 to 24 inches above the frame. For Super-77, use 24 to 36 inches. Spray about one foot per second. You will be surprised how little adhesive is required. Remember, less is lighter. Another way to get a light coating is to spray up in the air and waft the model frame through the fine droplets as the descend. Two or three passes this way will be enough. Test the stickiness with a clean finger in several places around the frame. Even if it barely clings to your skin, it is enough.

Wright Stuff frames are quite stiff and let you use one of several covering techniques. First, you can lay out the film on a smooth workbench. Don't use the dining room table because later you will cut the excess film off with a pencil soldering iron. The sprayed frame is set onto the film sticky side down. Push down on one spar, getting it to stick; then, push down on the other spar. Finally, push on the ribs. Another way to cover is to put the frame on the bench, sticky side up and have two people hold the film, one hand at each corner. Lower the film onto the frame, being careful not to stretch it tight. And still a third way is to put the film on the bench, smoothing out any big wrinkles. Build a heavy balsa frame from 1/4" square at least 2" larger than the wing in both directions. It can be glued together with superglue. Spray it and the wing frame. Place the heavy frame on the film and cut off the excess with a pencil soldering iron (see below). Place the sprayed wing frame on the bench and lower the film frame over it, touching the film along the spars and tips. If the ribs have a lot of camber, the frame may need to be squeezed chordwise to loosen the film and allow it to go over the ribs. There are many ways to cover a wing. Keep it as simple as possible and avoid stretching the film which might pull on the structure, just like that nasty tissue used to do.

Cutting off the excess film is easy with a pencil soldering iron (a 23 to 47 watt iron with a thin chisel tip is good). Not only is this much easier than trying to use razor blades, it seals the film edge and prevents rips that might propagate readily. Be sure the iron is hot. Some irons take several minutes to heat up. The iron can be rubbed against the balsa spars or tips. Move smoothly around the frame. Sometimes melted film builds up on the iron and then leaves a black glob on the frame. Clean the goo off the hot iron with coarse sandpaper once per frame.

A technique that helps to keep the big wrinkles out, makes it easier to apply the film, and makes the models fly slower without sacrificing any performance is to roll the film into a tight ball a couple of times. This produces hundreds of tiny wrinkles and gives the film a hazy appearance. It also gives it some spring so that the covering goes on smoothly. The spring is weak enough to not pull the outlines. The same frame or four-hands covering

techniques described above still apply. When you pull the film out from the ball, don't stretch it so much that those tiny wrinkles begin to disappear. Stretch it just enough to remove the big wrinkles.

Dihedral in wings can be added at this stage. Cut long scarf splices in the spars. Starting at the outside of a dihedral rib at the inside of a spar, cut diagonally outwards and towards the center of the wing to get an angled cut about 1/4" long (for 1/16" spars). Do this for all four joints. Prop the tips up the amount called for on the plans. Note that if you cut the way described, the film holds the tip spars in place. Carefully spread the joint a little and put some glue in the opening. Push the tip spar against the center spar and repeat for the other joints. This kind of joint is a bit ugly, but has a lot of gluing area and is very strong. Also, any glue shrinkage is mostly chordwise and won't change the dihedral angle. After it has dried for a couple of hours, the bottom can be sanded to clean up the uglies. The film near the dihedral ribs will loosen a little. For small dihedral angles, don't worry about it. For large angles where there is pronounced sag, wet a very small brush in spray cement (from a spot sprayed on paper) and lightly dot the film five or six places along the dihedral rib. You may want to thin the cement with some toluene (Elmer's contact cement solvent) to make brush easier. When the dots get tacky, gently nudge the loose film against it with a thin flat (but dull) tool, or balsa sliver, from below the wing. Be careful not to push too much film onto the cement strip or the dihedral rib will bow excessively. If this happens, pull the film apart and rework it. This technique requires some practice. But remember, loose film is not too detrimental to long flights.

These covering suggestions should get you well on your way to Wright Stuff modelling without the frustrations encountered with paper and other plastic covering materials. Soon you will be devising your own special techniques to further simplify the job. Good luck!

Vendors:

Tim Goldstein
www.fid.biz
www.indoorduration.com

Indoor Model Supply
Box 2020
Florence, OR 97439
541 902-8508

Micro X
P O Box 1063
Lorain, OH 44055
Microx@erienet.net

Ray Harlan
15 Happy Hollow Rd.
Wayland, MA 01778
www.indoorduration.com, under links

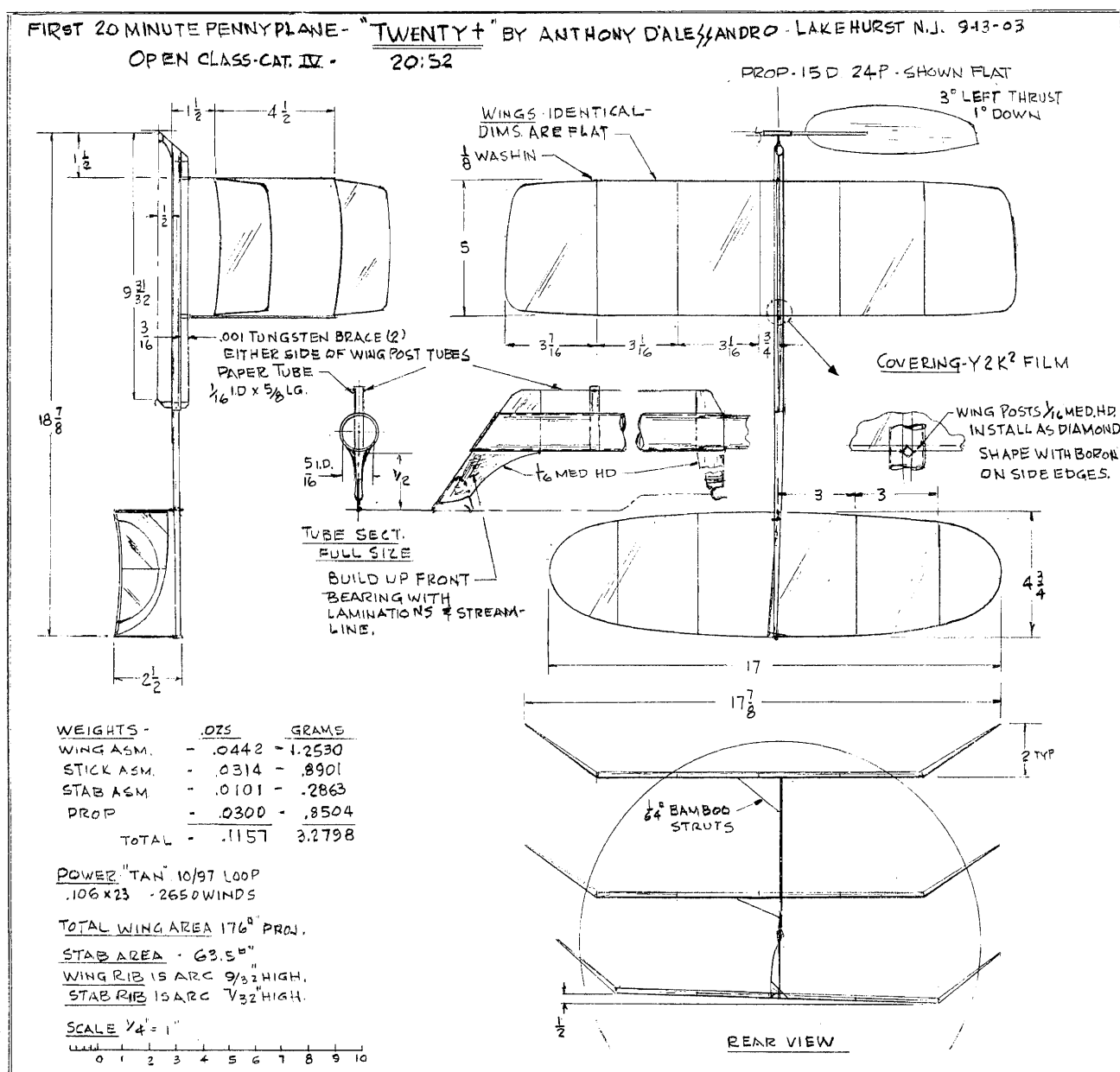
David Lewis
3435 S. Orange Ave K205
Orlando, FL 32806-8538
www.homefly.com

Campbell Model Supply
37742 Carson
Farmington Hills, MI 48331

FAI Model Supply
P O Box 366
Sayre, PA 18840-0366
570 882-9873
www.faimodelsupply.com

Model Research Labs
www.modelresearchlabs.com

WES-Technik
www.wes-technik.de



Here is the plan for Tony D'Alessandro's Twenty Plus, left out of the last issue. With apologies. – Ed.

	NFFS MODEL OF THE YEAR NOMINATIONS National Free Flight Society 2005 Symposium
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Yes, its time to nominate another brood of models for the NFFS indoor model of the year for 2005. This is the last time I am chairing the effort, so novel and unusual designs are most welcome.

Contact me at:

Aram Schlosberg, 718-479-0478, aram.sclosberg@verizon.net

UPCOMING EVENTS TO MARK ON YOUR CALENDER FOR 2005

- Jan – March Annual Hangar Rat Postal will be running again Jan. 2 to March 31st of 2005. Entry forms and rules, which are the same as last year, may be gotten from me either snail mail or email. Art Lane, artlane@skynet.ca, C.D. Hangar Rat Postal.
- Feb 26 Unidome Indoor Ralley, Cedar Falls IA, Bob Nelson, 319-233-4771, bobsr@forbin.net.
- March 13, Bong Eagles Annual Spring Indoor Contest, Memorial Hall, 72 Seventh St., Racine WI. A Cat II Site. CD Joe Adams, 306 E. Kendale Dr., Oak Creek, WI 53154, 414-762-3492, jadams8405@wi.rr.com. Or Jack Boone, 262-363-3133, jboone@elknet.net.
- April 2, 3 Midwest Indoor Championships, hosted by the Chicago Aeronuts, University of Illinois Armory, Champaign, IL. A 94 ft ceiling site. Bob Warmann, 630-834-9075.
- April 9 MMAC Annual Indoor Meet, hosted by the Minneapolis Model Aero Club, Held in the Burnsville High School Gym, a 22' site, south of the city. CD Gary Oakins, 651-429-3150.
- April 9 The Heart of America FF Association (HAFFA) Indoor Championship, Kansas City College and Bible School, 7401 Metcalf, Overland Park, KS. Contact Emil Schutzzel, 913-362-3095.
- April 10 Cleveland Free Flight Society annual Indoor Contest, Kent State Univ. Field House, Kent, OH. Contact Don Slusarczyk, 868 Eaglewood Dr., Willoughby, OH 44094, dslusarc@comcast.net.
- April 16 Peach State Indoor Championships, hosted by the Thermal Thumbers of Metro Atlanta. To be held at the North Cobb High School, 3400 Old 41 Highway, Kennesaw, GA. Check out www.thermalthumbers.com David Mills, President, 404-509-4209, davidmillsatl@comcast.net.
- April 23,24 The Willamette Modelers Club of Albany, Oregon is hosting an Indoor Record Trials and Symposium in the Albany High School Gym. 36' Ceiling. CD John Lenderman, 17086 Hall Rd., Clatskanie, OR 97016.
- May 1 The 2005 Spring Indoor Fling, hosted by the Cloudbusters Model Airplane Club, Inside Swing Golf Dome, Flint, MI. The site has a 300 x 400 ft floor and an 83 ft. ceiling. Contact George Lewis 810-329-6833, or Fred Gregg Jr. 586-264-1018.
- June 1-5 United States Indoor Championships (USIC), East Tennessee State University Minidome, Johnson City, TN. A world-class indoor football site. Abram Van Dover, CD, 757-877-2830 or Dave Thomson at 513-574-8322.
- July 23-26 Kibbie Dome Annual, University of Idaho, Moscow, ID, a world class site with 144' ceiling. Fly 8 am to 8 pm, all classes, four days. CD Andy Tadliafico 503-452-0546.
- Nov 13 Bong Eagles Annual Fall Indoor Contest, Memorial Hall, 72 Seventh St., Racine WI. Cat II site. CD Joe Adams, 306 E. Kendale Dr., Oak Creek, WI 53154, 414-762-3492, jadams8405@wi.rr.com.

Indoor Site News and Views

West Baden, IN - We have learned from Walt Van Gorder that the upper floors of the West Baden Springs hotel and atrium have been leased by Donald Trump, and are being redone into luxury suites. A gambling casino is in the works, along with a complete refurbishing of the French Lick Hotel.

Tampa, FL - We also hear from Bill Carney that the Tampa Armory is changing owners, and its future as a site is in doubt. But...

Rockledge, FL – Bill also tells us that a new member of the Florida Fliers, Ed Archer has gotten Rockledge Church of the Nazarene, 651 Barnes Blvd in Rockledge, Florida, 1.6 miles from US Highway 1. The church has a spacious meeting room with a clean ceiling. For those non-Floridians among you, that is on the eastern coast highway, right by Cocoa Beach and Cape Canaveral. They have already had a club contest this past January 29, 2005, and hope to have many more. As far as we know, the Prime Osborn Center in Jacksonville and the Tropicana Dome in St. Pete are still possibilities for bigger contests, but the church site is much needed for club flying on a more regular basis.

Santa Ana, CA - From Steve Brown, "Nothing is going on at Santa Ana. The ownership of the base was transferred to the City of Tustin several years ago. It has been in legal limbo with much "remediation" going on to mitigate 60 years of fuel leaks, etc. Now construction is starting. Bob Randolph couldn't even get a return call."

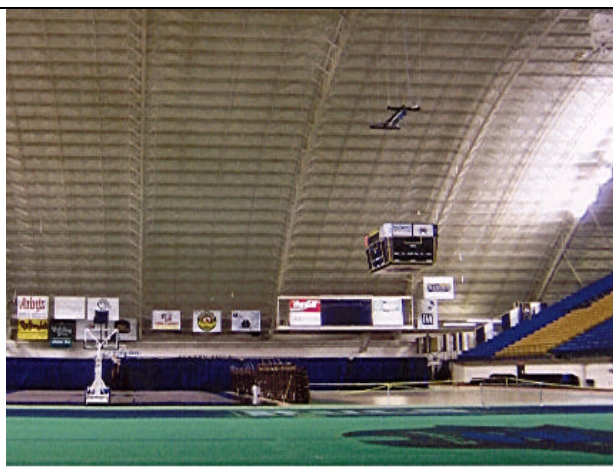
Johnson City, TN - Got some good news and some bad for the 2005 AMA/USIC Nationals. The dates are, June 1 thru June 5. The bad news? A basketball scoreboard has been installed and will interfere with a good portion of the air space near the center of the flying space. This scoreboard will now be a permanent part of the facility. It does not make the Minidome unflyable, but it does add a different approach to launching and trimming your model. ETSU has given up football with the 2003 season. Basketball is now the big money maker in sports at the school. On the good side we have brought back some events dropped for the 2004 event. A poll was run at the 2004 Indoors asking what events the contestants would like to have on the 2005 schedule. The events most popular in the poll were brought back. A-ROG, Ornithopter and Ministick Mass Launch. We also dropped two events: AMA Rubber scale and RC Electric Duration.

We will also need a new Contest Director for 2005. I feel that four years is enough and I would like to get some indoor flying in. - Abram Van Dover

Buffalo, NY – Bob Clemens tells us that if the scoreboard situation causes loss of attendance at USIC, the Buffalo Bills Fieldhouse management is receptive to hosting the Championships in New York.



Rockledge Church of the Nazarene site.

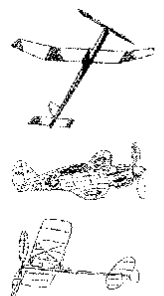


The new USIC scoreboard, 35' lowered, 55 raised

International Contest Calendar 2005

What & When	Where	Info
14th Florence Indoor Open International 23.01.2005	Florence, Italy	Classes: F1L, F1M/mod, TH, Ministick, F1N, Katapult, FunFly contest begins at 9:00 and finish at 18:30 - Contact: Club GAF, Box 18250, 50100 Firenze, Italy – phone: 0039 05522 1625 email: jacopopesiolini@hotmail.com
BMFA Scale Indoor Meeting 13.2.2005	Birmingham, England	Open Classes Flying Only, Peanut, Pistachio with Static Judging, Fun Flying, No R/C. 9 to 6. Cocks Moors Woods Leisure Centre, Kings Heath, Birmingham. Contact Charlie Newman on 01865 873020 or charlie@newman737.freemove.co.uk
Dutch National Indoor Fly in 26.02.2005	Nijmegen, Netherlands	Contest will be flown in the Jan Massinkhal (smooth ceiling, about 7.80 m. high) in Nijmegen. Classes: F1M, (F)Looper. Contact Thedo Andre at Theodo.Andre@net.HCC.nl for more info.
UniDome Indoor Rally Indoor 06-07.03.2005	Unidome, Cedar Falls, USA	Website: http://showcase.netins.net/web/sig/unidome2004.html Contact: Bob Nelson - Phone: 319-233-4771 - Email: bobsr@forbin.net
Bong Eagles Spring Indoor Rally 13.03.2005	Racine, WI, USA	for Cat II 208, 215, 220(JSO), 218(J)(SO), 507(JSO). Site: Memorial Hall. Contact: Jack Boone, PH:262-363-3133 email: jboone@elknet.net . Double Wammy Design and Delta Dart mass launch elimination No Cal and Scale mass launch.
Kottenpark Indoor 2005 (Dutch National Championships F1M) 20.03.2005	Enschede, Netherlands	Contest will be flown in either 1 or 2 sporting halls of about 9 metres high. Classes to be flown will be: F1M, (F)Looper, Bostonian, Sport-scale, Indoor-chuck, Pylon-race. Please contact Gert Brendel at indoorflight@yahoo.com for more information.
Midwest Indoor Championships 02-03.04.2005	Champaign, IL., USA	hosted by the Chicago Aeronuts Contact: Bob Warmann, phone 630-834-9075.
2005 Spring Indoor Fling 01.05.2005	Flint, MI, USA	Hosted by the Cloudbusters Model Airplane Club inside Swing Golf Dome for Cat. III 203, 206, 208, 212, 218(J)(SO) 215, 217, 219, 220, 505, 507(JSO). The site is 300'x400' with an 83' unobstructed ceiling. The floor is artificial turf. Contact: George Lewis 810-329-6833, or Fred Gregg Jr. 586-264-1018.
Concours International 25-26.06.2005	Bordeaux, France	Concours International F1D, F1L. Contact: Jean-Pierre Darrouzes, 32 Avenue du Marechal de Lattre de Tassigny, 33610 Cestas, France tel: +33 5 56 07 65 66, fax: +33 5 56 36 95 44, email: darrouzesjp@aol.com
Dorcol Cup F1D 26-28.08.2005	Beograd, Serbia and Montenegro	Entry fee €10. Contact: Vojislav Stokovic, Kralja Petra 70, 11000 Beograd, Serbia and Montenegro, tel: +381 11 189 627 or +381 64 345 9848, fax: +381 11 625 371, email: aviamodeli55@yahoo.com
European Championships F1D 04-07.10.2005	Bordeaux, France	Contact: Jean-Pierre Darrouzes - 32 Avenue du Marechal de Lattre de Tassigny, 33610 Cestas, France, email: darrouzesjp@aol.com Telephone : +33 5 56 07 65 66 Fax: +33 5 56 36 95 44
Coupe du Vin Rouge 30.10.2005	Dillingen, Germany	offener Saalflug-Wettbewerb, Sporthalle West, Dillingen Contact: Alfred Klinck, Kurt-Schumacher-Allee 235, 66740 Saarlouis
Saalflug Schorndorf 20.11.2005	Schorndorf, Germany	F1M, F1M-L, Mini-Stick, Saalflug Schorndorf, Contact: BeSchwende@aol.com , www.modelflug-schorndorf.de

Thanks to Gert Brendel in the Netherlands



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<http://www.F1D.biz>

John Diebolt Wins Oppegard Trophy for 2004

To Michael Smith, Curator AMA Museum, Muncie, IN
Hi Michael: John O'Leary here.

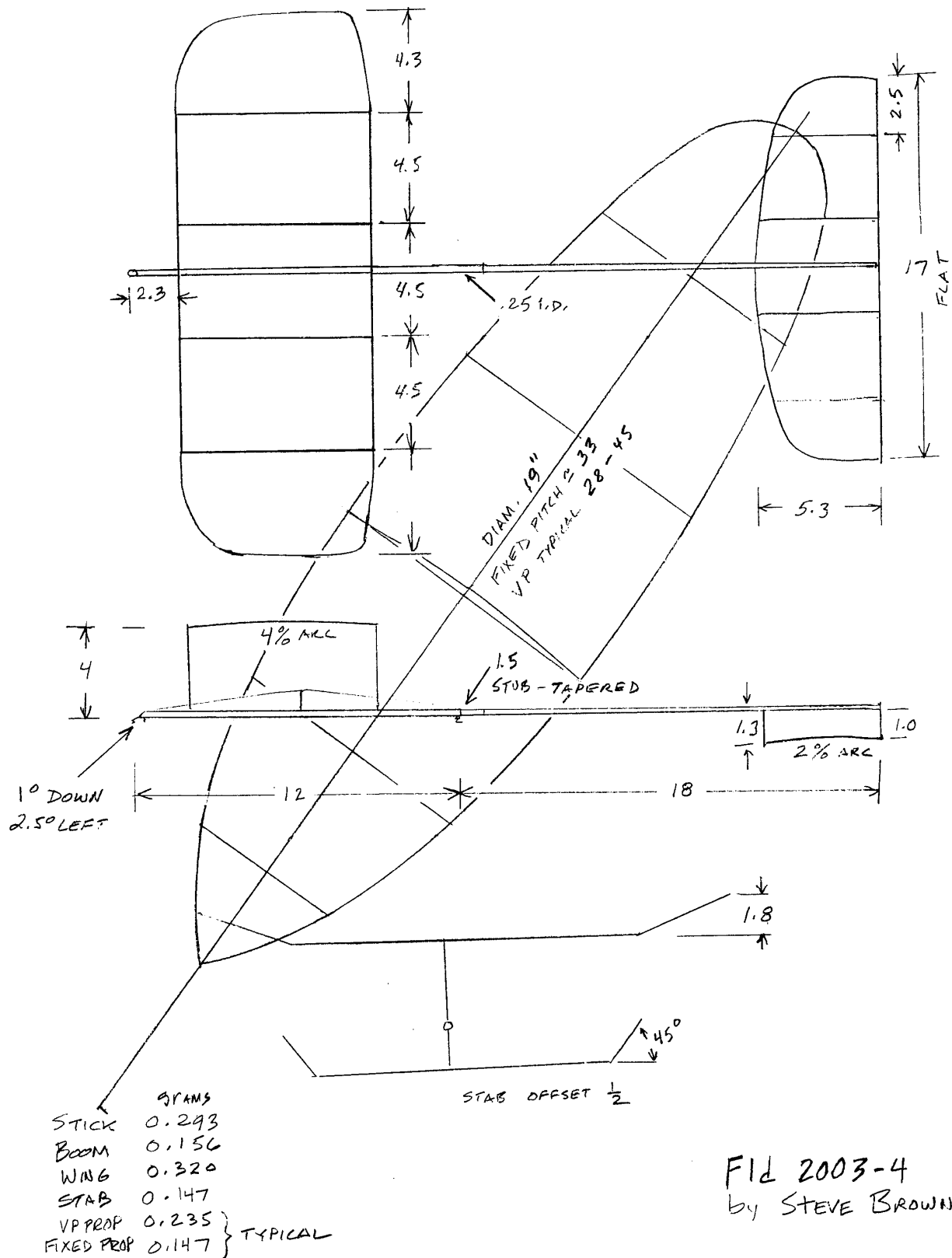
I'm the former editor of the Minneapolis Model Aero Club newsletter and was one of two club members (Gary Oakins, the other) who initiated the effort to have an AMA perpetual trophy, honoring Bob Oppegard's contribution, in the museum collection. The Minneapolis MAC is very pleased that this event took place during the AMA Outdoor Free Flight Nats with Abram Van Dover, CD, Gary Oakins and yourself attending. The trophy acknowledges the high time winner of the Pennyplane event at each AMA Indoor Nats. According to the Indoor News and Views, the 2004 winner was John Diebolt, AMA #5286, with a time of 17:34. Could you follow through and send a congratulatory letter to John and have the brass plate inscribed with his name, date and time. If you could get back to me with John Diebolt's address, phone number and email address, I'd appreciate the opportunity to send him a congrats note on behalf of the club.

John O'Leary, AMA #86735

Photos show Abram Van Dover, CD of the 2004 Indoor Nationals, bottom, and Michael Smith, Curator, AMA Museum, top.



“F1D 2004 – 4 “
First place 2004 Kibbiedome Winner by Steve Brown, San Dimas, CA



F1D 2003-4
 by STEVE BROWN

How to Make a Flight Log

By Ray Harlan, Wayland, MA

rbharlan@comcast.net

Even when first trimming your model to fly, it is useful to create a flight log. It will help you sort out which variables are influencing the model's performance and by how much. Keeping good notes will help you fly the model consistently after it is trimmed. Rubber can be very fickle and seem not to behave the same way on consecutive flights. However, usually it is some difference in the way it is wound or torque levels that is the culprit. A torque meter is one of the most useful tools to get consistent flights. You can make one (ask me for a copy of the article Build a Simple Torque Meter) or purchase it from one of the mail-order companies (www.indoorduration.com and links on that site).

Let's take a look at the nine parameters in the table below. Although you only need six to have a qualified flight log, there are more parameters that should be recorded if you want to learn how to get the most from your model. Motor length always is measured when the motor is new and has never been wound. After a motor is wound the first time, it has some permanent stretch that will increase slightly as it is wound more times. Since the motor weighs 2 grams, or something close to that, and the density of rubber is nearly constant, the only parameter we need to define whether the motor is skinny or fat is the length. If you get your best times on a 14" motor, you will know that a 13" motor will run out of turns too soon or get the model too high and that a 15" motor will not get your model high enough to fly a long time and will come down with a lot of turns left. Being able to adjust the width of a motor, so the length can be changed and the weight held constant, requires the use of a rubber stripper to cut custom widths. There may be a model airplane enthusiast in your area who has one.

When you wind a motor, you should get it close to breaking in order to make it do the most work for you. That is not to say that you launch the model with it fully wound. Rubber exhibits a hysteresis effect; you don't get out what you put in! By winding it all the way up, the unwinding torque curve will be flatter and will have a higher average torque than if the motor is only wound to the launch torque. By recording the max torque and turns, you will know what levels did not break the motor, so you may be able to repeat them for the next windup. After you have gotten the model to fly well, it is worthwhile to wind some motors to breaking so that you know the limits. Rubber is capricious; it may break at surprisingly low torque levels. Always check the motor for little tears in it. (Especially around the knot. – Ed) If you see any fraying, discard it.

The next two parameters, launch turns and torque, go hand-in-hand to define the energy in the motor at the start of a flight. For a particular motor, they are the variables that control how high the model will climb. Since we fly mostly in low ceilings that have nasty girders, they are critical to learn in order to keep the model safe. The maximum torque that a motor can be wound to is 5 or 6 times higher than the average torque. This means that the rubber is very nonlinear in its torque characteristics. This isn't a terrible thing for us, however. It is easy to see how raising or lowering these two parameters affects peak height. You can think of it this way: at some torque, the model will just fly steady and level. If the torque is increased, it will climb until the motor has unwound to the point of level flight torque. Further unwinding will lower the torque and the model will begin to descend.

Finding the right launch torque should be done in steps. If the model climbs halfway up with 1200 turns, add only 100 turns to the next flight. Notice that the torque goes up much more than the 8% you increased the turns. This time, the model might go three quarters of the way up. Succeeding flights should have turns increased by smaller increments until the model just touches the girders once or twice (or maybe not at all if they catch models easily).

It is important to know how to wind a motor to get the most out of it. To get the most turns, it needs to be lubricated and stretched. Use a lube like ArmorAll or Formula 2001, found in auto parts stores. After some of the liquid has evaporated, they get nice and greasy to keep the rubber from chafing on itself. Stretch the motor about 6 feet and put half of the turns in at that distance. Then continue winding and moving closer to the other

end of the motor until it is about 12" long when fully wound. Of course you don't know what max turns are, so it is clear you need to wind the motor several times and ultimately break it so you can find out how much it takes.

Once you have gotten the model to reach the ceiling, it is time to fine tune the motor used. Every time it lands, put the winder back on the rear of the motor and count how many turns are left. This is a good clue in choosing the right motor. If the rubber has only a few turns, or it ran out of turns in the air, the motor is too short and you need more turns. If it comes down from the ceiling with 700 or more turns, the motor is too long. Ideally, the average torque should be near that needed for level flight. Finding average torque is complex and not really needed. Instead, just experiment with different length motors until you find the one that gets the best time. In a low ceiling (20 – 30 ft.), 250 to 500 turns at landing may be about right.

As a motor is used for more flights, it will take some more turns to get to the max torque. Most of this energy is seen at the end of rundown and is not useful. The important thing is to wind to the same peak torque each time. After each flight, inspect the rubber for nicks or fraying. Discard any that are damaged.

You can measure the height of your flying site with a balloon on a string. Let the balloon touch the girders and use a tape measure to find the length of the string and balloon after it is pulled down parallel to the floor. Proportioning this height (1/2, 3/4, 7/8 etc.) gets you the peak height entry in the log.

Measure off 20 feet on the floor and mark both ends with tape. Start with a heel at the first mark and walk naturally to the second mark, counting steps as you go. Divide 20 by the number of steps to get your step length. When your model is flying, stand under it as it flies by and start walking to the other side of the circle in which it is flying. Count the steps and multiply by the length of your step to get the circle diameter. Models should fly in small circles (10 -15 ft) in small sites and larger circles (20 - 30 ft) in larger sites. If the circle is small and the model is banking a lot, it needs to be retrimmed, perhaps adding left wing washin (twist trailing edge down), removing some left rudder and left thrust. In a site with a peaked roof, a small circle lets the model climb higher and if it does hit a girder and the circle moves, it has less chance of getting into trouble.

It should be clear by now that the parameters listed in the flight log are very useful for improving flights as you build up experience with your model. There are lots more things that could be recorded, but these are the most important ones. Lots of practice will make you a better flier, able to find the best settings in a new flying site at a regional or state meet much faster than someone who just finished a model the night before.

	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5
Motor length (new)					
Max turns					
Max torque					
Launch turns					
Launch torque					
Turns at landing					
Flight time					
Peak height					
Circle diameter					

(Ray's original article had four of these tables on one page. We only show one to save space. –Ed.)

It's not easy for everyone to find the latest Sci Oly rules every darn year, so we save you the trouble.

WRIGHT STUFF 2005 B RULES

DESCRIPTION: The objective of this event is to construct and fly a rubber-powered monoplane model airplane to its maximum flight time. Prior to the tournament, participants will construct and test up to two airplanes. The event should occur inside and the room dimensions (approximate length, width and ceiling height) should be made available to teams in advance of the competition. Directors and supervisors are urged to minimize the effects of environmental factors such as air currents (e.g., doors, fans, etc.)

NUMBER OF PARTICIPANTS: 1 or 2

TIME: 8 minutes

IMPOUND: No

1) CONSTRUCTION SPECIFICATIONS:

- a) A rubber-motor-powered, propeller-driven airplane may be constructed from published plan(s), commercial kit and/or a student's design as long as the following specifications are satisfied:
- b) Airplanes will be constructed only from wood, paper, plastic film covering and glue except for the propeller assembly and motor hooks. The major components (wing assembly, tail assembly, propeller assembly and motor stick) may be attached to each other using thread, music wire, malleable wire, paper or plastic tubes, and/or rubber bands. Plastic or rubber o-rings, may be used to attach the motor to the airplane and propeller drive. Any dense material may be used for ballast.
- c) Total mass of the airplane without rubber motor to be 7.0 grams or more.
- d) Maximum horizontally projected wingspan of 40.0 cm, maximum wing cord (straight-line distance from leading edge of wing to trailing edge, parallel to the fuselage) of 10.0 cm, and maximum horizontally projected stabilizer span of 28 cm.
- e) The propeller assembly may include a propeller, shaft, hanger, and/or thrust bearing. Bushings may be placed in the propeller or thrust bearing to reduce wobble or friction. The assembly can be built by the competitor(s) or purchased pre-assembled. It must use a single two-bladed commercially made plastic propeller with a maximum diameter of 18.5 cm. Longer propellers may be trimmed to meet this specification. Trimming/shaving/twisting is also permitted to balance and/or reduce the mass of propeller or to change its pitch.
- f) A rubber motor not to exceed a mass of 2.0 grams (including any attachments like o-rings) will power the airplanes and will be massed separately from the airplane. Motors may be lubricated before and/or after check-in. All qualified motors will be impounded after check-in and will be available to the teams only for official flights.
- g) The airplane must be marked in such a way as to be easily identified by the event director.
- h) **THE COMPETITION:**
- i) At the event supervisor's discretion, test flights may occur throughout the contest but will yield to any official flight. No test flights will occur in the last half-hour of the event. Multiple airplanes may test fly at once. A self-checking inspection station may be made available to students for checking their airplanes. The use of any type of winder is permitted.
- j) Each team must present a flight log of recorded data for at least 6 parameters for at least ten test flights prior to the competition. The three required parameters to be recorded are: 1) motor size before windup (mass, length, width), 2) number of turns on the motor at launch, 3) flight time. The team may choose the 3 additional data parameters beyond those required, for example, turns remaining after landing, estimated/recorded peak flight height, estimated flight path diameter, the torque at launch, etc.
- k) Teams will be given 8 minutes to launch 2 official flights. Event time starts when the first airplane is launched. Any flight beginning within the 8-minute period will be permitted to fly to completion. Participants will be permitted to make adjustments to the airplane; however, time for such adjustments will be part of the 8-minute flight period.
- l) Timing for each flight begins when the airplane leaves the student's hand and will stop when any part of the airplane touches the floor. If the model comes to rest on something other than the floor, another watch will be started. If the model comes free within ten seconds, timing continues. If not, timing ceases and ten seconds are deducted from the time for the official score. The timing official will measure and record the time aloft to the nearest tenth of a second for each flight. Steering the model by contacting it is prohibited. During the flight of one team's airplane, other official flights may be permitted by the event Supervisor. This can be done if the first airplane has started its descent pattern. In the unlikely event of a collision, a team may elect to re-fly. The decision to re-fly may be made after the model lands. The eight-minute period does not apply to such flights.
- m) Only competitors will be permitted in the competition/testing areas. Competitors shall communicate only with officials and Wright Stuff teammate upon entering the testing or flying area until their official flight is completed. The event Director shall have a separate area away from the competitors' area designated for parents, coaches, and other spectators. Any team having communications other than that described above will be disqualified.
- n) Resource links may be found at <http://www.soinc.org>

SCORING: The winner is the team with the longest time aloft for either flight. Ties will be broken by the longest second flight. Teams without a flight log will be scored below those with logs.

THIS EVENT IS SPONSORED BY MIDWEST PRODUCTS CO.

WRIGHT STUFF 2005 C RULES

DESCRIPTION:

The objective of this event is to construct and fly a rubber-powered model airplane to its maximum flight time. Prior to the tournament, participants will construct and test up to two airplanes. Biplanes are permitted. The event should occur inside and the room dimensions (approximate length, width and ceiling height) should be made available to teams in advance of the competition. Directors and supervisors are urged to minimize the effects of environmental factors such as air currents (e.g., doors, fans, etc.).

NUMBER OF PARTICIPANTS: UP TO 2

TIME: 8 minutes

IMPOUND: No

1) CONSTRUCTION SPECIFICATIONS:

- a) A rubber-motor-powered, propeller-driven airplane may be constructed from published plan(s), commercial kit and/or a student's design as long as the following specifications are satisfied:
- b) Airplanes will be constructed only from wood, paper, plastic film covering and glue except for the propeller assembly, ribbon assembly and motor hooks. The major components (wing assembly, tail assembly, propeller assembly and motor stick) may be attached to each other using thread, music wire, malleable wire, paper or plastic tubes, and/or rubber bands. Plastic or rubber o-rings may be used to attach the motor to the airplane and propeller drive. Any dense material may be used for ballast.
- c) Total mass of the airplane throughout the flight, excluding the rubber motor, must be 8.0 grams or more.
- d) Maximum horizontally projected wing span of 48.0 cm, maximum wing chord (straight line distance from leading edge of wing to trailing edge, parallel to the fuselage) of 12.0 cm, and maximum horizontally projected stabilizer span of 35.0 cm
- e) The propeller assembly may include a propeller, a shaft, a hanger, and/or a thrust bearing. Bushings may be placed in the propeller or thrust bearing to reduce wobble or friction. The assembly can be built by the competitor(s) or purchased pre-assembled. It must use a single two-bladed commercially made plastic propeller with a maximum diameter of 24.0 cm. Longer propellers may be trimmed to meet this specification. Trimming/shaving/twisting is also permitted to balance and/or reduce the mass of propeller or to change its pitch.
- f) A rubber motor not to exceed a mass of 2.0 grams (including any attachments like o-rings) will power the airplanes and will be massed separately from the airplane. Motors may be lubricated before and/or after check-in. All qualified motors will be impounded after check-in and will be available to the teams only for official flights.
- g) The airplane must be marked in such a way as to be easily identified by the event supervisor.

2) THE COMPETITION:

- a) At the event supervisor's discretion, test flights may occur throughout the contest but will yield to any official flight. No test flights will occur in the last half-hour of the event. Multiple airplanes may test fly at once. A self-checking inspection station may be made available to students for checking their airplanes. The use of any type of winder is permitted.
- b) Each team must present a flight log of recorded data for at least 6 parameters for at least ten test flights prior to the competition. The three required parameters to be recorded are: 1) motor size before windup (mass, length, width), 2) number of turns on the motor at launch, 3) flight time. The team may choose the 3 additional data parameters beyond those required, for example, turns remaining after landing, estimated/recorded peak flight height, estimated flight path diameter, the torque at launch, etc.
- c) Teams will be given 8 minutes to launch 2 official flights. Event time starts when the first airplane is launched. Any flight beginning within the 8-minute period will be permitted to fly to completion. Participants will be permitted to make adjustments to the airplane; however, time for such adjustments will be part of the 8 minute flight period.
- d) Timing for each flight starts when the airplane leaves the student's hand and will stop when any part of the airplane touches the floor. If the model comes to rest on something other than the floor, another watch will be started. If the model comes free within ten seconds, timing continues. If not, timing ceases and ten seconds are deducted from the time for the official score. The timing official will measure and record the time aloft to the nearest tenth of a second for each flight. Steering the model by contacting it is prohibited. During the flight of one team's airplane, other official flights may be permitted by the event Supervisor. This can be done if the first airplane has started its descent. In the unlikely event of a collision, a team may elect a re-flight. The decision to re-fly may be made after the model lands. The eight-minute period does not apply to such flight.
- e) Only competitors will be allowed in the testing/flying areas. Competitors shall communicate only with officials and their Wright Stuff teammate upon entering the testing/flying areas until after their official flights have been completed. The event director shall have a separate area away from the competitors' area designated for coaches, parents, and other spectators. Any team having any type of communication other than that described above shall be disqualified.
- f) Bonus: At the State level, a 15 seconds bonus may be earned by having the airplane release a ribbon during the flight anytime after the first 15 seconds and before the airplane lands. At the National level, a 20 second bonus will be awarded if the ribbon is released from 30-45 seconds into the flight. The ribbon size must be at least 1.0 cm wide X 10.0 cm long and readily seen. The ribbon and any parts to be released will not be included in the mass of the airplane nor in the mass of the motor.
- g) Resource links may be found at <http://www.soinc.org>

SCORING: The winner is the team with the longest time aloft for either flight. Ties will be broken by the longest time of the other flight. Teams without a flight log will be scored below those with logs. THIS EVENT IS SPONSORED BY MIDWEST PRODUCTS CO.

Indoor Postal Contest Results Form

2005 International Postal Contest
%Andrew Tagliafico
10039 SW Quail Post Rd.
Portland, OR 97219
USA

Club Name_____

Date of Contest____/____/____ Site Name_____

Ceiling Height_____Feet

Circle One:

Ministick

A-6

Contestant Name	Address	Time in Seconds	Timer Initials

2005 INTERNATIONAL INDOOR POSTAL CONTEST

For Ministick and A-6 Events

Andrew Tagliafico and Bob Stalick are pleased to announce our sponsorship of the 2005 International Indoor Postal Contest again. This year we are sponsoring two events: Ministick and A6. The competition will begin on January 1, 2005 and conclude on April 30, 2005. As in the past, contestants may fly as many times as they wish in as many sites as they wish during this 4 month period. Only the highest score will be counted in each event. All scores are to be mailed to Andrew Tagliafico at the address below, and all scores must be received no later than May 15, 2004. Scores received after May 15 will be disregarded.

Scores will be published twice during the competition and sent to all who have registered scores. The first publication is expected to be around March 1, 2005. The second and final publication of scores will be after all flights have been registered and is expected to be around June 1, 2005. All participants will receive a final report. Trophies will be awarded to third place in each event.

All scores must be posted on the official score sheet, which is attached. Please use only this form or photocopies of it and send only to Andrew Tagliafico.

****Note:** This is the last year that we will be sponsoring this International Indoor Postal Contest. If any individual or club wishes to assume sponsorship for 2006, please contact Andrew Tagliafico ASAP. **

Ministick

The contest is open to indoor models that comply with the AMA Ministick rules. All contest flights are to be timed by someone other than the flier. The best single flight time wins., after the flight time has been corrected for different ceiling heights. Ceiling height to be measured as per FAI rules, but with a five meter diameter circle. The corrections factor is 627 divided by $(167 + 46 \times \text{the square root of the ceiling height in feet})$. The time in seconds will be multiplied by this number to give the corrected time.

Mini-Stick Model Rules

1. The Ministick model shall be a monoplane covered with any commercially available material sold in sheet form. Microfilm is not allowed.
2. The maximum projected wingspan shall be seven (7") inches.
3. The maximum wing chord shall be two and one-half ($2 \frac{1}{2}$ ") inches.
4. The maximum length from front of nose bearing to front of rear motor hook shall be five (5") inches.
5. The maximum length from front of nose bearing to rearmost part of model shall be ten (10") inches.
6. The projected area of the stabilizer shall not exceed 50 percent of the projected area of the wing.
7. The maximum diameter of the propeller shall be seven (7") inches. The propeller shall be constructed of wood. Wire shafts are permitted. Hubs that allow blade replacement and/or manual pitch adjustment are allowed. Mechanisms that cause variable pitch and/or variable diameter of propellers while in flight shall not be allowed (Natural flexing and flaring of wooden blades is allowed).
8. The minimum overall weight of the model (without motor) shall be 0.015 ounce.
9. Construction is to be primarily wood, with adhesives used only for joining Tissue and/or thread is permitted for wrapping bearings, hooks and for making sockets, if desired. Boron, carbon fiber, Kevlar and fine wire bracing are not permitted.
10. Mechanisms that restrict the torque available to the propeller are not allowed.

Send Results to: Andrew Tagliafico

10039 SW Quail Post Road
Portland, OR 97219 USA

A-6

The contest is open to indoor models that comply with the A-6 rules. All contest flights to be timed by someone other than the flier. Best single flight time wins after the flight time has been corrected for the 70 foot factor. Ceiling height will be determined by the AMA/FAI measurement method. Flight times will be normalized against times from the highest site entered according to the following formula:

The normalized flight time = $\frac{2}{3} (\text{highest ceiling height} - \text{local ceiling height}) + (\text{local time})$. *Highest ceiling height will be established at 70 feet until an entry from a higher site is received.

The official normalized times will *not* be available until the competition is completed.

A-6-Model Rules

1. 30 sq. in. max wing area
2. 1/32" max prop shaft diameter
3. A 6" max prop diameter. The blades are to be flat, no camber. Blades may be made from 1/32" thick (1 mm) balsa or unlightened plastic but not foam.
4. 6" max motor stick length as measured from the prop thrust bearing to the rear hook Tail boom length is unlimited.
5. All strip wood construction is to be a minimum of 1 / 16" x 1 / 16" (1.5mm x 1.5mm where only metric sizes are available). Strip wood may not be modified to any shape other than a square.
6. All sheet wood construction, prop blades, wing and stab ribs are to be a minimum of 1/32" (1 mm) thick. Prop ade edges may not be rounded.
7. All wing and stab ribs will be 1/32" x 1 / 16" (1.5mm x 1.0 mm) minimum cross section.
8. Covering materials are limited to: Japanese tissue, Gampi paper or condenser paper.
9. Only wood, wire, adhesives and allowed covering materials can be used for construction with the exception of the prop shaft support and bearing which maybe wire, aluminum or plastic. No special indoor material maybe used.
10. Rubber power only.
11. The use of metric size wood is restricted to those who normally cannot get other size wood.
12. The model must weight a minimum of 1.2 grams.

Editors are often pack rats when it comes to rosters and membership lists, and yours truly is one of the worst. I am always surprised at how few of you on the INAV rolls belong to the National Free Flight Society, and are getting Walt Rozelle's great 32 page Digest every month. We were selling NFFS Directories at Johnson City, you see, and their 2004 roster is a window into the larger US free flight community. Walter showed up at the Tampa armory this spring and got the indoor bug, and our own John Kagan and Jim Buxton have been sending indoor photos and articles to the Digest on a regular basis. For example, the July/August 2004 issue devoted 9 ½ pages plus the cover toUSIC.

The same issue had the following by Jim Buxton, and since too many of us (myself included) have only a vague idea of who our leadership is, or what they are up to on our behalf, we reprint it here.

NFFS Indoor Committee Sets Goals, Seeks Community Input

By Jim Buxton, Hilliard, Ohio

I want to take this opportunity to introduce myself to NFFS members. It is an honor to serve as chairman of the newly established Indoor Committee, which is part of the NFFS Competitions Committee. Goal of this committee is to promote indoor free flight, and funnel our thoughts and projections to the NFFS Board of Directors. Members of the Indoor Committee are:

Jim Buxton (Hilliard, OH); John Kagan (Strongsville, OH); Larry Coslick (St. Louis, MO); Tony Italiano (Brookfield, WI); Jim Lewis (Macon, GA); Gary Baughman (Marietta, GA); and Don Slusarczyk (Willoughby, OH). I am thankful to have such a strong and dedicated group of people surrounding me. We are all committed to improving the current situations the indoor community is facing.

The committee's first step was to hold a meeting on the eve of the US Indoor Championships. The meeting was attended by members of the committee, Rex Hinson (president of NFFS), and anyone who happened to pass by. A few of the items that were covered during this meeting were:

(1) Keys to insuring the future success ofUSIC. Look for an article in an upcoming Digest by a guy who should know, Tony Italiano.

(2) An indoor U.S. high-point program for the indoor community. The idea stemmed from the great success of the America's Cup and National Cup outdoor programs. The idea is to increase participation at local and regional levels by establishing a national point system. Jim Lewis will be helping to collect all of the ideas and get a plan implemented by the 2005 contest year. Send your thoughts and suggestions to Jim Lewis, 76 Jennings LN., Macon, GA, 31210.

(3) More publicity for the indoor community. I will be soliciting more indoor material to appear in Digest. Attention to indoor matters on the NFFS Web site will be expanding as well. One aspect of this will include a complete indoor contest listing*. Please contact me regarding any indoor contests that are planned, and I will be compiling the information to be placed on the site. Our goal is to have dates, contact info, site descriptions and contest flyers for every indoor contest of the season, accessible on the Web. Contact Jim Buxton, 3956 Wallington Dr., Hilliard, OH, 43026.

(4) John Kagan will be assembling a thorough and accurate list of all known active indoor venues. This is a formidable task, so please help John by informing him of any indoor activity in your area. He wants to know when, where, how often, and what the building looks like. John will also be working on researching new sites for our use. Contact John at 20100 Killian's Grove, Strongsville, OH 44149.

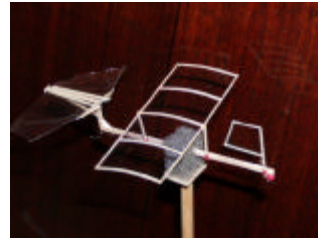
This is just the beginning. We have much work to do and need the help of the entire indoor community. The members of this committee are here to collect the ideas and help bring them to life. Please contact any committee member and share your ideas. The committee needs input from the membership to improve publicity and participation, the biggest problems facing indoor today. We need the help of the entire membership, and new members to preserve indoor flying for future generations.

*Go to <http://freeflight.org> for the NFFS site, then click on Competitions at the top, then Indoor Contest Calender, then after browsing that, click on the line that says, "Here is an Extensive Listing of Upcoming Events by Location by Jim Buxton." The last will be almost exactly what we run in each issue of Indoor News and Views. – Ed.

UNITED STATES INDOOR CHAMPIONSHIPS				2005 SCHEDULE			
	7:30	2:30	2:31	6:00	6:01/6:30	6:31	10:00
WEDNESDAY	IHLG	P-24 LAUNCH*	INTERMEDIATE STICK		R		INTERMEDIATE STICK
1 JUNE 2005	STD CATAPULT	AT 2:15	35 CM*		E		35 CM*
	UNLIM CATAPULT		F1D		T		F1D
	RTP SPEED*				R		
	STRAIGHT LINE SPEED*				V		
	RACE TO THE ROOF*				L		
////////////////////////////////////							
	7:30	1:00	1:01	4:00	4:01/4:30	4:31	10:00
THURSDAY	FAC PEANUT*			F1D			F1D
2 JUNE 2005	BOSTONIAN		HAND LAUNCH STICK		R		HAND LAUNCH STICK
	HI WING MONO*		A ROG (ROG STICK)*		E		A ROG (ROG STICK)*
	MODERN CIVIL PRODUCTION*				T		
	WW 1 MASS LAUNCH*	11:30			R		
	BOSTONIAN MASS LAUNCH*	12:30			V		
	UNLIMITED RUBBER SPEED*				L		
////////////////////////////////////							
	7:30	12:00	12:01	4:00	4:01/4:30	4:31	10:00
FRIDAY	AMA PEANUT		MINISTICK		R		MINISTICK
3 JUNE 2005	DIME SCALE*		EZ-B		E		EZ-B
	SCIENCE OLYMPIAD*		F1L*		T		F1L*
	FAC SCALE*				R		MINISTICK MASS LAUNCH
	GOLDEN AGE*				V		
					L	AT 4:31	
////////////////////////////////////							
	7:30	12:00	12:01	3:00	3:01/3:30	3:31	10:00
SATURDAY	COCONUT SCALE*		PENNYPLANE		R		PENNYPLANE
4 JUNE 2005	NO CAL SCALE*		MANHATTAN		E		MANHATTAN
	SCIENCE OLYMPIAD*				T		HELICOPTER
	WW II MASS LAUNCH*	12:00			R		ORNITHOPTER
	COCONUT MASS LAUNCH*	11:30			V		A-6*
////////////////////////////////////							
	7:30	11:30	11:31/12:00	3:00	3:01		6:00
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		L				*= NON-AMA EVENTS	
						HAVE A GREAT WEEK !!!	
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BUMBLEBEE ORNITHOPTER CONSTRUCTION ARTICLE

By Chris Doughty <indoorff@yahoo.com>



INTRO

This ornithopter is an original design, and built properly, should be a nice little flyer. I designed it for the TRUMP (Tiny RUBber Models Postal) competition to compete in the 3" span class. This class posed some challenges with torque; these little models tended to roll violently when wound up. The first solution to this problem that I found was to eliminate the propeller all together and have flapping wings. This certainly solved the problem, and the model put in some competitive times, and it was actually leading over the conventional fixed wings for a time.

I have had flight times greater than 30 seconds in a larger area, but the Bumblebee is perfectly at home to buzz around your living room. Great care and precision is needed to build this intricate little flyer, but built right, it will reward you with remarkable flights, and is sure to catch other people's attention.

Due to the complexity of building and assembling this little beast, I will be going through the construction step by step so people of all skill levels should be able to follow what is going on. The wire bending is very complex, so I will do my best to describe how to do it. If you have an Internet connection, visit ((will have link later)) and follow the links to the Bumblebee page. Here you will find more 3D drawings, in addition to the ones in this article, that I created of the wire parts for the ornithopter as well as some assembly drawings. I will also make the files available in the ".blend" format they were created in, so you can view them in actual 3D on your computer.

All construction is done with ambroid glue, thinned 50/50 with acetone, unless otherwise noted. A couple changes from the original design have been made and are noted so you can choose which way to build it. All wood parts can be built right over the plans in this article.

NOTES

General assembly tips: use as little glue as possible – glue=weight, and the ornithopter needs to be very light. My finished plane (without the rubber band) weighed under 0.5g. Make sure all joints are precise – the flappers flap between 40-50 times per second or more, so any failure can prove to be catastrophic. The drawing is full sized so you can build right over it if you want. It is broken down into the key components to make building easier. ALL DIMENSIONS THAT FOLLOW ARE IN INCHES, UNLESS OTHERWISE NOTED.

BUILDING INSTRUCTIONS

[1] Use 0.095 x 0.064 wood for the fuselage. Make sure the joints are very tight and perfect, as you do not want this area to fail. The vertical lines on the motorstick indicate the location of tissue tubes that will be added later. The flapper mount, at the rear top of the plane is 0.063 sqr and the diagonal brace supporting it is 0.031 sqr.

[2] The flappers can be built next. Use 0.043 x 0.043 wood to build them. On the plans, there are two variations on the flappers, the original and the new. The original used a 0.004 boron fiber as the main spar, while the new one just uses wood. Both work well, but the best times I have had were with the boron. The plans include both versions, so if you are accustomed to working with boron, by all means build the original version, as it is higher performance and much more durable in the event of a brush with a wall. If you build the wood form, you may wish to give the spar a slight taper towards the tip, however, this is not required.

[3] The canard can be built next. use the 0.028 x 0.032 wood for the main spars, and use sheet wood sliced for the ribs. Make the posts out of the .031 square wood.

[4] Build the rudder next. For the outline, use 0.026 x 0.020 wood, and for the post, use 0.031 x 0.031. The boom can be made from 0.031 x 0.028 balsa, cut to length as per the drawing.

There you go. You have now finished building up all the structures/flying surfaces for the model. So much for the easy part!

[5] Wing wire bending - use 0.005 piano wire for all wing wires. Due to the complex 3d shapes the wires must be bent into, please see the 3D drawings provided. Start by bending the wire shown in Fig. 1 below. This mounts on the underside of your wing and is where the conrods attach. Now bend wires shown in Fig. 2 and 3, and that will be all that needs to be done for the wing. The wire in Fig. 2 mounts on the bottom of the wing and serves to hold the flapper to the fuselage, allowing it to pivot up and down. The wire in Fig. 3 also does this, but at the rear section of the wing.

Mount all 3 of these wires now. See Fig. 5 for locations.

Try to be as precise as possible without driving yourself crazy. The closer you are to the indicated dimensions, the more predictable your plane will fly. I cannot guarantee what kind of flight characteristics will develop if your wire lengths are far off.

[6] Bend the crank next. See Fig. 4. Bend the crank out of the 0.009 wire. It is important in the crank to make the bends as crisp and as close to 90 degrees as possible.

[7] Making the conrods. This is a relatively easy step. Use 0.005 wire for them. The holes are 0.86 apart. A good way to do this is to make a jig using a piece of hard balsa or basswood that is .25 sqr. Get two scraps of .009 wire and poke them into the wood at 0.86 apart, leaving about 0.125 sticking out of the top. Wick some thin CA around the base of the wire so they will not pull out. Use this jig to wrap .005 wire around the two pins making a conrod with a hole in each end that are 0.86 apart. See plans for a diagram of the jig and conrods.

[8] Now make a wire pigtail bearing out of the 0.009 wire to hold the crank in. Glue the pigtail bearing to the side of the fuselage at the end, use the fuselage side view as a guide.

[9] Bend a rubber hook out of .009 wire for the front of the ornithopter as per the outline on the drawing. This is a simple 2d procedure, and not critical. Mount onto fuselage, as per the side view.

There you go, you have now finished all the annoying wire bending!

[10] Now we need to make the small rectangular bits of aluminum that the flapper wires will pivot in to provide the up/down motion of the wings. Take an aluminum can, and cut out a section of it. Flatten it, and sand it as thin as you dare with a fine grit sandpaper. Now cut two rectangles out of it that are 0.06 x 0.21. Take a scrap of .009 wire and gently twist and push it into the aluminum to make a hole in it. Make another hole 0.15 distance apart from the first. See the plans for the layout of the aluminum and holes. Now glue the aluminum to the wing mount, at the back top of the fuselage, one on each end. Orient the rectangle of aluminum so as the top side is the longest side. Use ambroid for this. See the Fig. 5 for more detail.

[11] Covering can be done next. The original model was covered with ultrafilm on the flappers, but I have also used condensor paper with good results. The adhesive I used for attaching the ultrafilm was simply sugar and water, if you decide to go that route. I recommend pre-shrinking the condenser paper first, so as not to warp the wings with changes in humidity. The original model had a microfilm covered canard and vertical stabilizer, but this proved to be fragile, and unnecessary. The model needed some nose ballast, so condenser paper can be used on both these flying surfaces with no net gain in weight. See the drawing for the pattern of the flapper fabric. There are two versions of flapper on the drawing. Try them both and see which one works best for you. The more angular one of the two requires a membrane stiffener to be glued to the covering on the underside. This is

.018 x .028 wood. Do not glue this stiffener to anything except the fabric itself. The more rounded version of the flapper requires more slack in the fabric. The template reflects this, and if cut out properly, and glued to the spars, it should give you the correct amount of slack. Use a thinned down white glue to attach the covering to the wood structure.

[12] At last, the part you have been waiting for, time for the final assembly. Mount the flappers as shown in Fig. 5, with Teflon washers where shown in the plan. To keep them sliding off, build up the end of the wire with ambroid big enough so it cannot slide back through the hole. Make tissue tubes using a scrap of the canard posts as a mandrel. You should have square tubes, so it fits tight with the canard posts. Do maybe about 5 wraps of the tissue, applying glue to it as your wrapping. When the desired number of wraps are reached, let glue dry. Then soften again with some acetone, and slide off mandrel. Glue the tubes (2 for canard, and one round one for the rudder) to the locations on shown on the fuselage drawing and the boom. Put the crank into the pigtail bearing you made and mounted to the fuselage, with a teflon washer between the bearing end and the crank to reduce friction. Now connect up the conrods as shown in Fig. 5. Again, to keep them from sliding back off, build up the end of the wire with ambroid just large enough that the conrods cannot slide off backwards. Mount the canard and the rudder in the tissue sockets now and glue the boom at the location shown on the drawings.

ALTERNATIVE: I have recently found that flight performance MAY be improved by putting both the conrods on the same location on the crank, the location closest to the rest of the plane. This makes the wings go up and down more or less together, and seems to help eliminate the side to side rocking motion that will cause a decrease in lift and thrust.

FLYING YOUR ORNITHOPTER

The Bumblebee is not an easy plane to get flying, so here are a few tips to get you started in trimming for flight.

The rubber for the motor should be stripped as thin as possible, right to the limit of what your rubber stripper is capable of. If you don't wreck a few trying to strip them, it is probably too thick.

It is very important to make sure there is absolutely no binding anywhere in the flapper mechanism. Without the rubber band, and the wings in the up position, they should be able to fall back to the down position freely, just by gravity alone. If they don't, something is binding somewhere and needs to be fixed.

Small amounts of clay can be added to the nose if necessary to bring the center of gravity to the correct location. This location depends on the flying characteristics of your model. Basically, you want it on the verge of stalling once the power starts to drop off.

You may find the plane has a tendency to turn one way quite sharply, and you need a huge rudder input to correct this. This probably means you fabric on your wings is not quite the same tension, and one is developing more thrust than the other. If this is the case, you may wish to recover the wings, being careful to try to keep the tensions equal on both wing fabrics.

If your ornithopter is still flying terribly, like diving into the ground, try winding the rubber the opposite way. You may not think this makes a difference, but it does! It is probably the single most noticeable adjustment you can make, and it will either cause the ornithopter to dive violently, or make it fly nice. I have found with mine that it likes to be wound the opposite way you would wind a normal propeller driven airplane.

If your plane still does not fly, the best advice i can give is just keep experimenting. Check all the critical wire lengths, or try re-covering the flappers with fabric that is a different tension. It takes quite a while to get it trimmed for a nice flight, but it will fly! If you have any questions while building, feel free to email me. I hope you enjoy building and flying this little plane.

DIAGRAMS

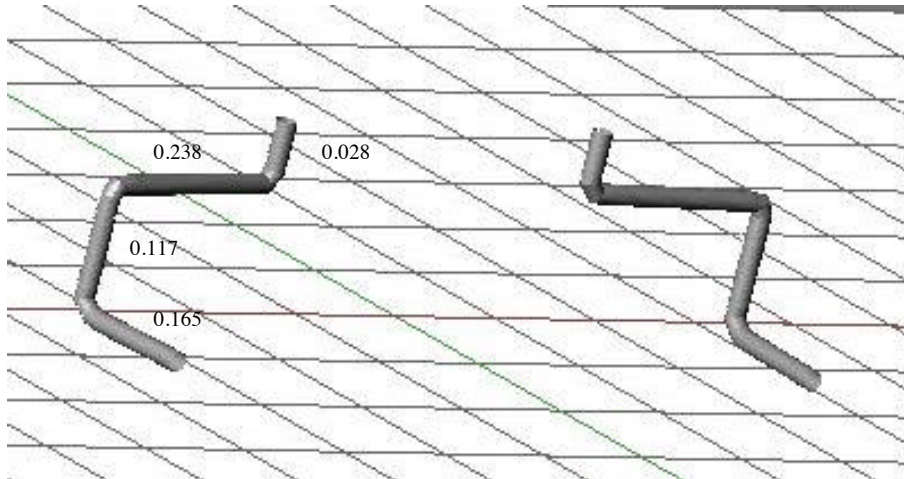


Figure 1

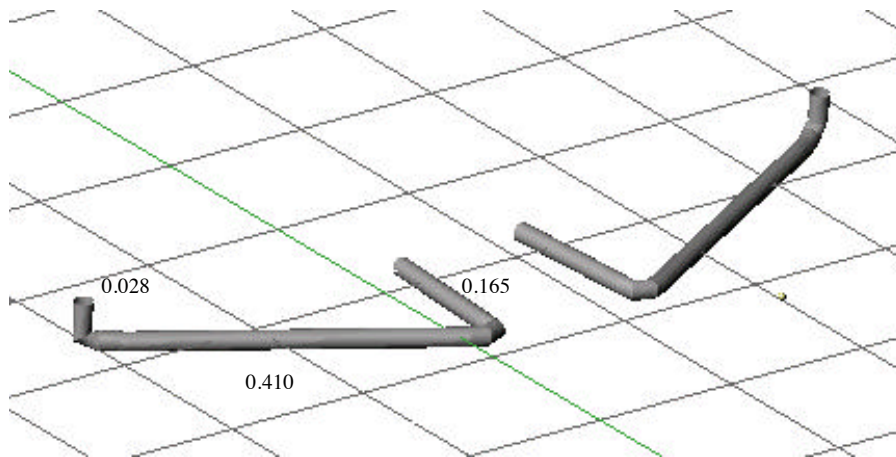


Figure 2

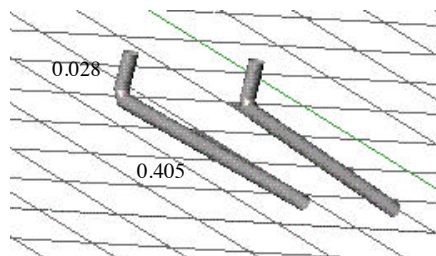


Figure 3

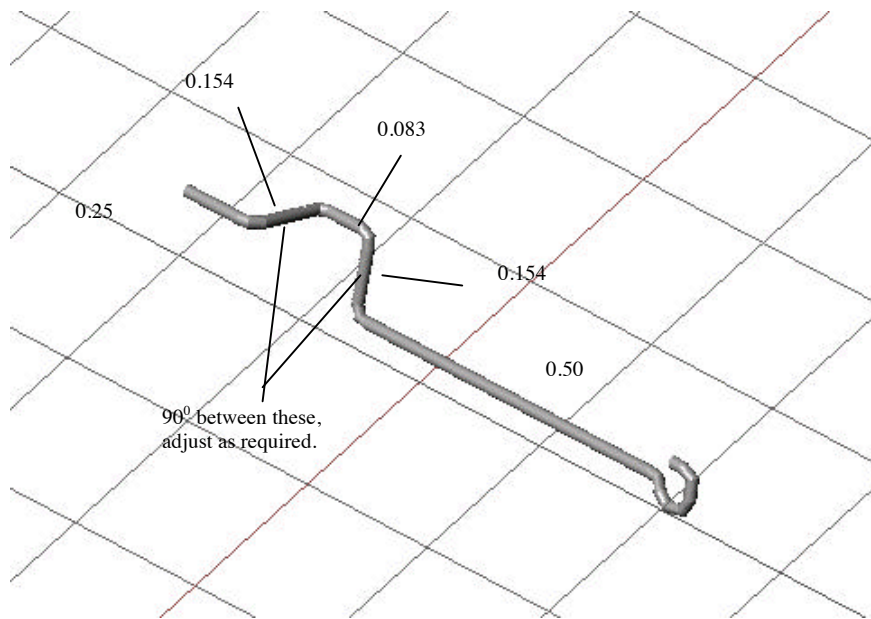


Figure 4

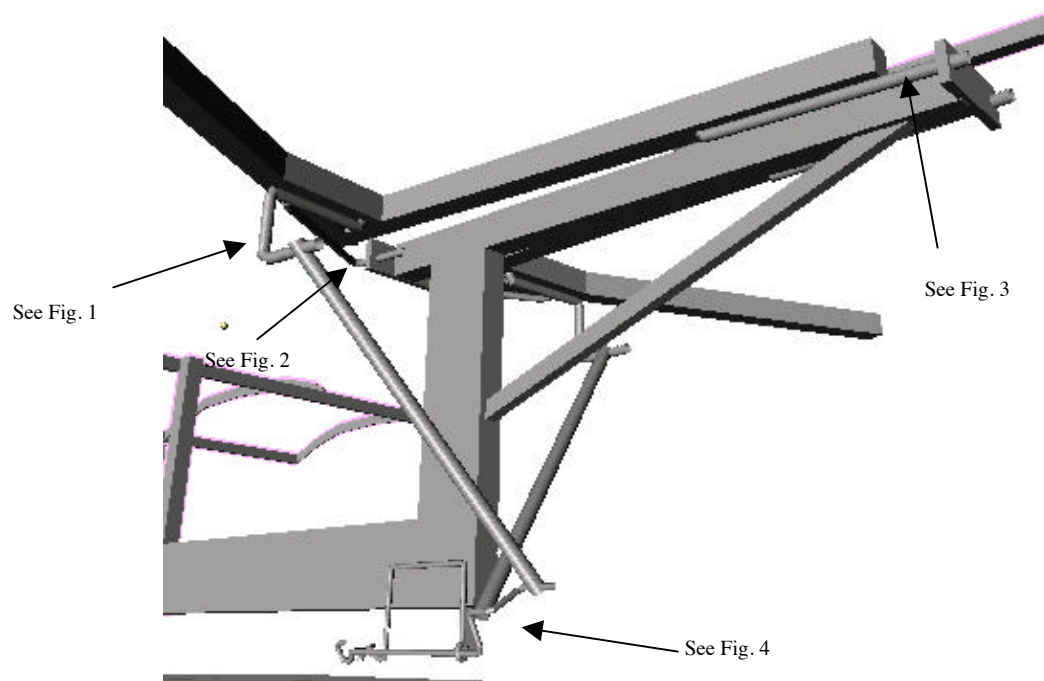
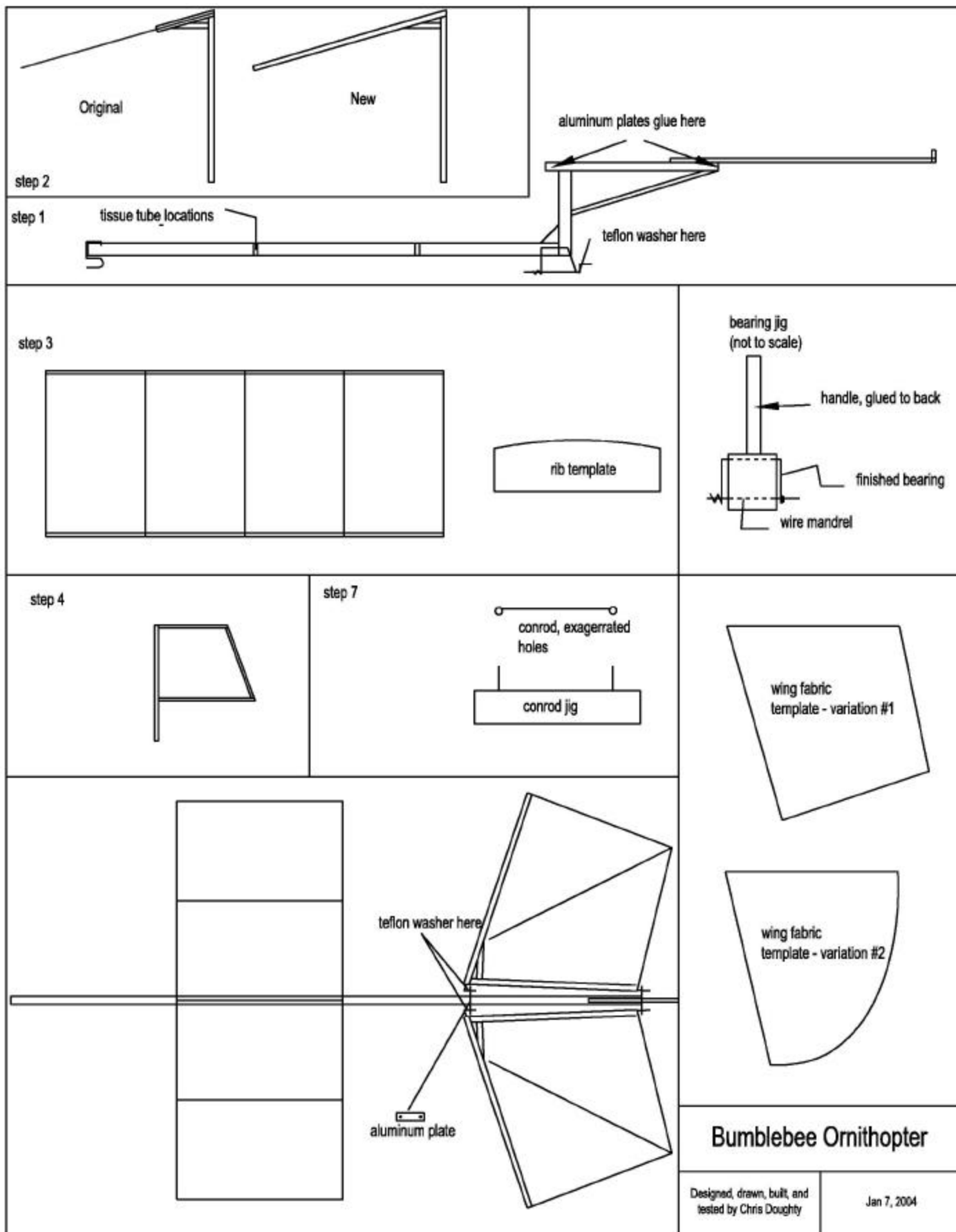
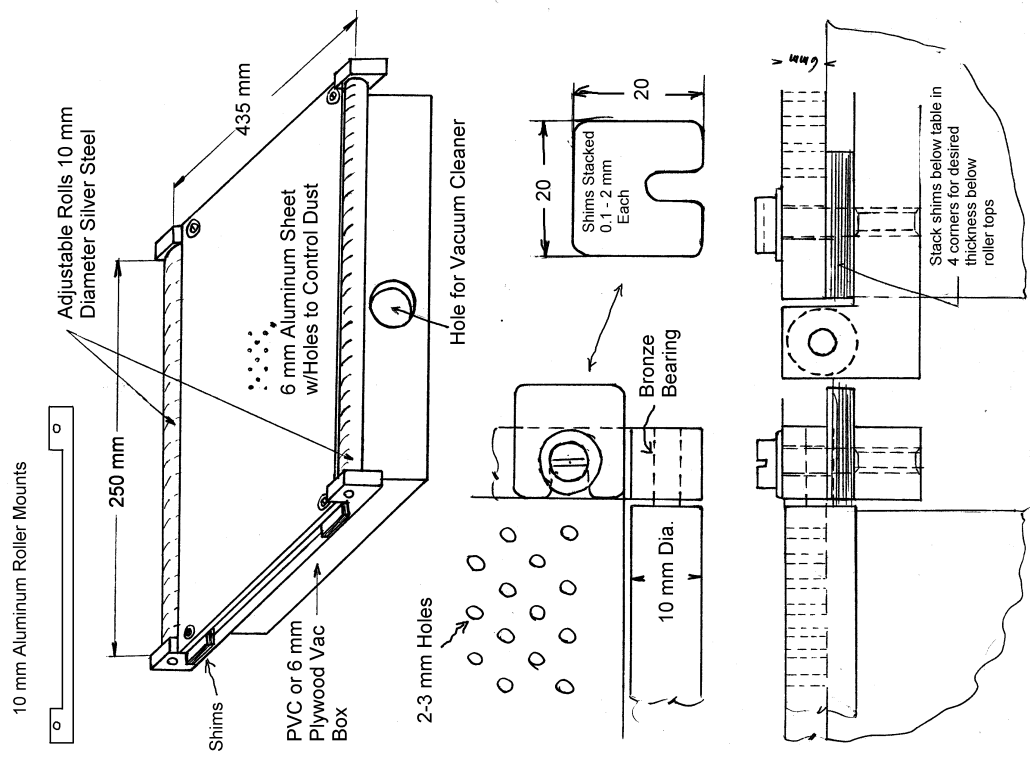


Fig. 5 -- Rear view of Bumblebee



Sanding Apparatus for Thin Balsa Sheets, Bruno Waechter, W. Ger., from INAV #71



F1D thoughts By Andras Ree

By now we have completed four contest seasons with the new F1D rules including two World championships and one European. So, it is possible to have a look on the facts, how the rules are working, how the expectations are fulfilled. Quite a long time ago Tim Goldstein asked me to write such a paper being more or less the originator and supporter of the new rule set and the one who managed the rule change. I apologize publicly it took so long time because of my very busy life, but this way I could take the advantage to have more experience with the rules.

Let me start with the words of Laurie Barr, that we had and still have *...not just F1D but more or less a general "indoor" crisis, existing on national champs level also, or even down. Just the money talks, practically no one wants to "sponsor" us by not asking for high rental fees from a 100 percent non-profit "civil" activity. We are not a circus in any respect for the public, we can not put advertisements on our "aircrafts", we are not interesting for the media (or just for three minutes).*

That was (and still is) only one aspect besides others, that led to the idea to change the F1D rules. At that time Hungary was the reigning world champion team, I was close second, so we took this position to propose the changes after several test flights and consultations, also international ones. We did not want to call for a vote, just collected the different arguments. Having the necessary international experience I became the front person of this activity and I made the final wording of the proposal, but the new F1D parameters were formulated from several ideas from different persons. The span value was based on the data collected by Rich Doig from airline regulations (23"x16"x9" max. cabin luggage size), to fit the boxes to the overhead lockers, the limited stab span (and other contributions) from Bernard Hunt to avoid the tandems, the rubber weight value came from my test flights, also the wing chord limit to avoid extreme wings and loosing the advantage of the higher minimum weight. At the same time France also made a rather similar proposal.

After the rule changes I have got and seen many different opinions, cold and warm as well, probably more cold than warm. After a while (about two seasons and after) the ratio has changed to the opposite, I have seen also enthusiastic opinions, and even I have got apologizing message as well. Of course cold ones are still exist.

At the time when the rule changes were argued a lot, there was one unique message from the indoor fraternity saying: *...The expert is expert, the rules are irrelevant and the same for everybody, therefore don't argue, work and fly instead...* The sender of the message to the indoor list was Jim Richmond. His indoor career fully confirms his message. Since this message he has got both world champion titles, also made a Cat III world record. Before, since his first title (Rome 1968) he was world champion with all the F1D rule sets (65 cm 1 time; 65 cm and 1 g model 5 times), all together he has got *eight* individual titles by now and made several world records.

Applying the new rules the expectations were:

1. Easier to build to weight;
2. Use plastic cover besides microfilm without weight penalty;
3. Less need for extra quality wood;
4. Have more durable models;
5. Easier to travel with much smaller boxes and less damage;
6. Keep the unique flying style and beauty of the F1D models;
7. Have lower performance;
8. Less need to use VP in higher sites;
9. Better use of the available lower sites;
10. Have more newcomer and even "oldcomer";
11. Have more organizers.

I believe the first six expectations have been fulfilled. **Build to weight** is easier now, the **plastic cover** became widely used, the **wood selection** is not as much critical as before.

As just recently Steve Brown expressed the **durability** of the models is much better. By my mind it is true for the flight, steering, collisions and transportation as well. This durability is caused by the stronger constructions and the plastic cover (by using the higher minimum weight). The plastic covered unbraced wings are great and made it possible to use really small boxes. **Traveling** with the small boxes with no damages is just perfect compared with the previous wardrobe like boxes.

We could keep **the flying style and beauty** of our models, because the main influencing parameter, the surface loading was intentionally adjusted to be in the same range as before. The visitors are still shocked when they see our models flying. The plastic covering shows a bit less beauty, but when precisely done it is also nice. This way we still can say after about twenty years with Jorgen Korsgaard (the founder of the European indoor newsletter) *...indoor is beautiful...*

The **performance** has been reduced, but after four season, it is clear, that not as much as expected. In the first year the reduction looked OK (times below 30 min.), but later in the high sites like the salt mine, different hangers and other places the times were raised to well over 30 minutes. In addition to that, in the new (but already lost) best ever site, the Cargo Lifter hanger, the high times were over the unbelievable 40 minutes. Probably these 40+ times are close to the overall potential of the present F1D models when using the best rubber batches, because the Cargo Lifter proved to be "infinitely" high, where not one of the models touched the roof. The performance in this site was of a unique, unexpected level, because of not having to back off before launch (using the initial burst as well) and the unbraced models have less drag, so this way the best models could gain more height. The overall performance reduction in Cat IV is about 8-9 minutes.

By now, there is no **need to use VP props** only in the Cargo Lifter and the salt mine. It looks true for the first site forever, but for the mine I am not 100 percent sure when looking at the flaring prop of Jim Richmond, several ceiling scrubbing models and the 33+ VP flight of Fred Tellier. Practically, in all recently used lower sites the VP (and the VD for Jim Richmond) is at an advantage over the fixed pitch props. (The firstly proposed 0.5 g rubber would have been better in this respect.) Of course, because of the limited available energy and the lower overall prop efficiency the times are well below the Cargo Lifter times. (With the old rules we used more rubber with the VP props.)

All in all, because of the fast changes in the model design and flying style (to fit to the new conditions) the performance reduction was overestimated, and the necessity for using the VP (in higher sites) was underestimated.

There are some changes in the **usage of lower sites**, because there is more reduction in the performances. In Cat III sites the reduction is about 10-11 minutes and in Cat II sites about 13-14 minutes. In these sites less models

can fly simultaneously (in some cases not more than only 2), so the shorter times give better organizational conditions.

The expected *more newcomer and "oldcomer"* are here, we also have more participating countries – the increase is fine, but still not enough. Just recently Alan Cohen pointed out ...*the new rules, by design, attracted many new flyers and brought back some experienced ones...* Maybe the best example is the very successful American junior team. By my knowledge, none of them were flying old rule F1Ds, none of them are family members, relatives or neighbors of any experienced indoor flyer. But, there was the SO program and the several mentors behind the success, so the solution is more complex and goes back to the long time existing problem that more efforts are needed to help the newcomers, mainly the young ones. I do not remember for the exact origin of the question to be put in front of us in our modeling workshop: *Have you helped a junior today?*

One of the most critical problems is to *have more organizers*. Recently UK was back (2003 European Champs) plus France (2005 E/Ch) and Serbia & Montenegro (bid for 2007 E/Ch) are new as organizers, but the need is still valid first of all for world champs. Of course this problem is closely connected to the usable sites. Usable in this respect means that the site is suitable for our purpose, getting a proper time window for a champ besides the other programs of the site is possible and the financial conditions are acceptable. Unfortunately in the past few years we have lost regularly used sites because of different reasons, and some others became not accessible just because of financial reasons. In addition to this we have lost the, only recently gained, unique and best ever indoor site, the Cargo Lifter hanger as well. Just for example we have lost the highest suitable site in Hungary, the traditional site of our nationals since 50 years, the site of the 1966 world champs in Debrecen. Since last year the owner, the University of Debrecen, does not accept less than the market price of renting for our non profit civil activity (see the words of Laurie at the beginning of this paper) even if the site would be empty otherwise. Here we are now, in this part of the world as well. But, and again, this situation is not because of the new F1D rules.

Applying the new rules some expressed concerns were:

1. Bigger effect of the rubber quality;
2. Rubber measuring problems;
3. Level the playground;
4. Harder to steer the new models.

As some others before, now Alan expressed the concern of the bigger *effect of rubber quality*, but it was like that always. It really counts only at the highest level, because it is much more important to fit the well trimmed the model, prop, rubber and VP (if used) to each other and all together to the given conditions. This can be done perfectly only by the best indoor personalities with a lot of efforts. Rather different models can fly very well at the same conditions. I will never forget when in Rome (1968) the two mostly different models (Richmond and Kalina) placed first and second. Recently the 5/99 and other good batches are also used in the second half of the world champs listings, and the contrary, the nowadays rather successful Lutz Schramm has no 5/99.

On the other hand the lack of access to top rubbers may become a real problem in a while, but not because of the new rules. It will affect not only newcomers but others as well. It is the same for the F1B class just they will be out of the good batches earlier. A recent dispute on the indoor list raised this problem up, started by Slobodan Midic, proposing to fly at champs only the rubber distributed by the organizer, but the present situation was well explained by Mark Bennett, Alan Cohen and Tim Goldstein. I fully agree with them looking at my example. I was rather competitive before the rule changes even in high sites (what we do not have at home) because of the work I have done and the experience I have collected through the decades. With the new rules I perform well in the lower home sites, but not yet at the previous level in high sites. It is simply because of the not enough effort. It was not intentional of course, just because of the lack of time, so I am in a delay. Some years ago I have seen a saying written on the wall of a gym: *No pain – no gain*. I had not enough pain yet...

Rubber measuring problems were also predicted, but the practice proved, we do not have real problems. Suitable digital scales are available at a reasonable price, and the practice to check the rubber weight only after the flight, and no check below an announced basic flight time and from the third round if there was no improvement, works fine.

That is just a joke of the life that by my knowledge I was the first and only one at the international level by now who has got zero for an official flight because of rubber over weight. At the 2003 E/Ch in London close to the end of the third round I ran out of my prepared rubbers and got one from my teammate. He has checked the rubber before on his Tanita scale and I had no time to check the rubber on the official scale as I always do. I

wound very fast and launched the model just 10 seconds before the end signal. The flight was good, would push me to the second place, the team third, but the rubber on the official scale was slightly over the limit.

How it happened? Next morning when cutting rubber we have got the answer. As everybody knows the rubber is getting static electric charge at cutting. Therefore we use a balsa podium on the scale to keep the rubber away from the plastic house of the Tanita scale and before measuring the weight we pull the rubber strip through in a carbon brush to reduce the charge. This time we could not measure the weight, the repeated measurements were distributed in about a 10 percent range. It never happened before. To solve the problem the scale, the brush and the rubber strips were earthed by the tap in the bathroom, the plastic covered surface of the table was cleaned by a wet towel and there was no more problem. The official scale was earthed... It was a rather expensive experience.

Level the playground was another concern, but it did not happen, the two world and one European champs prove this. The results are a bit closer and new competitors were on the podium. Both are good, but still Jim is the world champion. The talent, skill and experience do not allow the playground to be leveled. It was also clearly expressed by LeRoy Cordes: *As a competitor in other events I know that no matter what you do to the rules the cream will always rise to the top.* I may also refer to Carlo Godel: *Whiners will whine and winners will win. And the winners are the ones who put the most into their winning ...*

I can not really consider the **harder to steer** remark of Steve Brown, because in our lower home sites we are only using long sticks. Dezso Orsovai made perfect steering at big heights just recently in the salt mine. I can steer now with less risk than before, but I have to declare I am not a big steerer by balloon.

Intentionally I did not react to any rough messages or remarks I read at the time of the rule changes. I think the reasons of these remarks were mainly the lack of information, experience and misunderstanding. Let me believe these reasons more or less have ceased by now.

Recently there are different things bothering our hobby/sport. The limited availability of good rubber and the reduced number of usable sites were discussed before. The airliners have been reduced a bit the allowed cabin baggage sizes to 22"x16"x8" or 22"x14"x9", but we are still not too much over with the length. We have lost the source of Y2K2 film, but the bit thicker film looks available for longer time. These are generating some new problems, but these are again not connected to the rule changes and hopefully will not destroy the class.

Summary

Looking at all the aspects I still believe, the positive side of the rule change is rather stronger than the negative. Maybe it is better to say that some expected goals were not reached at the level I (we) expected. I still want to believe in the future of F1D, we can at least slow down the declining of the class, and I hope not to reach the vision that Steve Brown expressed some years ago in his paper.

It is our responsibility to do what we can within the more and more hard conditions. We have to work for our indoor community; need to put more work into our future, first of all into the young ones. We have to say thank you to those who are already doing this, like the INAV and IFI staff, the SO instructors and so on.

I also have to mention one rather general experience coming from my 20 years of CIAM activity. The main obstacles to have changes are the majority of the current top fliers in any class even if the class is going to be ceased. Bernie Hunt underlined a simple fact around the rule change period that we never would be able to reach an agreement in possible changes therefore somebody had to take the risk to move without the warranty but with the hope to have success.

Some addition to plastic covering

For me it is still easier to cover by microfilm (having good microfilm made by Orsovai and a bit more than 50 years of experience) but by now I have learned it. We keep the surfaces on the jig for covering and we are using a water based, clear and cheap paper glue diluted very much by distilled water and some butanol: 9 cm³ distilled water + 1 cm³ butanol contains 5 drops of glue. First the glue is added to the water, the butanol just afterwards otherwise the fluid becomes milky. It is sticky enough, dries slow enough to leave time for arranging the film, and using water the connection can be solved if needed.

INDOOR

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RARIFIED ATMOSPHERE – THE SIXTY MINUTE CLUB

Steve Brown and John Kagan

Thanks to Fred Tellier

From The Editor's Desk

This issue we have the results and writeups for nine contests so far this season. First was the Midwest Champs in Champaign at the beginning of April, then the Willamette (pronounced wil-LA-met) two-day meet in Albany Oregon two weeks later, then the U.S. Indoor Championships at Johnson City in June, the Lakehurst July Fourth bash, and finally Kibbie Dome at Moscow, Idaho. From the European scene, we also have the Bordeaux indoor contest, the British team selection finals and the F1D European Championships thanks to Geoffrey Lefever and Nick Aikman.

We here at INAV have never paid too much attention to those who would claim indoor modeling is dying. As anyone could see by the club contest listings in previous issues, our sport is certainly doing well at the club level. But on the national scene, it has also been a very good year so far. There were 86 entrants at USIC, and everyone had a good time despite the new scoreboard hanging down in the middle. Lakehurst had good air and a good showing of 30 plus for the Fourth, where John Kagan broke one hour officially for the first time. As for Kibbie Dome, there were 76 entrants, over double last year's figures, and perhaps the best ever, with a strong international presence in the glider Battle of Seattle, the SO team competition, and the Junior and Senior F1D Trials. Credit goes to Abram Van Dover and his crew at Johnson City, Rob Romash flying in from Colorado and John Kagan from Ohio to run the Lakehurst events, and Andrew Tagliafico overcoming hoards of volleyball girls and moms on Saturday, to put on a great event at Moscow, which we will remember for a long time to come.

- Carl Bakay

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Indoor News and Views is an open forum presenting ideas, opinions, model designs and techniques for the indoor community. Unless specifically stated, INAV does not offer any opinion as to the merit of published work, nor does it endorse any products or services advertised herein.

From the Publisher

Another issue is finally making its way out. INAV is ready to move forward thanks to the efforts of Tony Pavel and Bill Gowen, but we are still in need of someone to take over the publisher's role. Tony has been putting in a lot of effort not only in taking over the membership duties, but also in helping to round up and coordinate material for future issues. Bill has done a major task for this issue by stepping in and basically serving as the editor while Carl was displaced by the hurricanes that have devastated his home. Thanks to both of them for their efforts. If anyone is interested in volunteering to help with INAV please raise your hand and let us know.

There is a new online group dedicated to the building of gliders and rubber powered indoor free flight planes. It is on Yahoo! Groups and is called Indoor_Construction. You can reach it at http://groups.yahoo.com/group/Indoor_Construction This group is a response to a falling out that occurred on another popular indoor related group when some of the members decided that it should no longer be a haven from the ever present electric and RC activity that is threatening our traditional sport. Mark Bennett took the initiative to start this new venue and is handling the thankless task of serving as the moderator. Through his extensive efforts the group already has the support of many of the top fliers in the world. It looks as if it will become a great electronic companion for those of us that want to see indoor continue in its traditional guise as a separate and distinct pursuit from R/C.

This sport has continued to exist due to the tremendous effort of many people. One that has had a profound impact on my getting involved in it is Don Slusarczyk. I want to offer my most sincere thanks to him for all the effort he put in over the last 7 or so years to bring the worldwide indoor community together. I hope that Mark Bennett's new effort can fill the void that has been created as Don steps back and spends some more time with his family.

Finally, indoor has lost a legend with the passing of Bud Tenny. Bud was the creator of INAV and faithfully served the indoor community for 40+ years. Many have said that INAV is the glue that holds indoor together, and without Bud it would have never happened. Bud also wrote the indoor articles in the AMA Model Aviation magazine for over 25 years, and it was one of these that hooked me into the sport. I am sure he touched many others in this sport, and I know that he will be missed.

Tim

 The logo for the NFFS Symposium features a stylized white bird in flight on a blue background, followed by the letters 'nffs' in a bold, black, lowercase font. Below this, the word 'Symposium' is written in a smaller, black, sans-serif font.	NFFS 2006 Symposium CALL FOR PAPERS
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Gentlemen:

The 2006 NFFS Symposium is now accepting papers. Would you be kind enough to put a notice in your respective publications? All types of articles are welcome. They can be technical, documentary, summaries of special building techniques, or anything of interest relating to indoor or outdoor free flight model competition. The deadline for drafts is Dec. 31, 2005. Thank you for your consideration.

I can be contacted at:

Harry Grogan, Editor, NFFS Sympo 2006
4176 Reynard Court
Oviedo, FL 32765
(407)365-1682

John Kagan Sets a Record One-Hour Flight at Lakehurst in Hand Launch Stick

July 4, 2005



My road to an hour flight began about a year ago. I loved watching the huge hand-launched stick models of Jim Grant, Jim Richmond, Steve Brown, etc. and had to have one for myself.

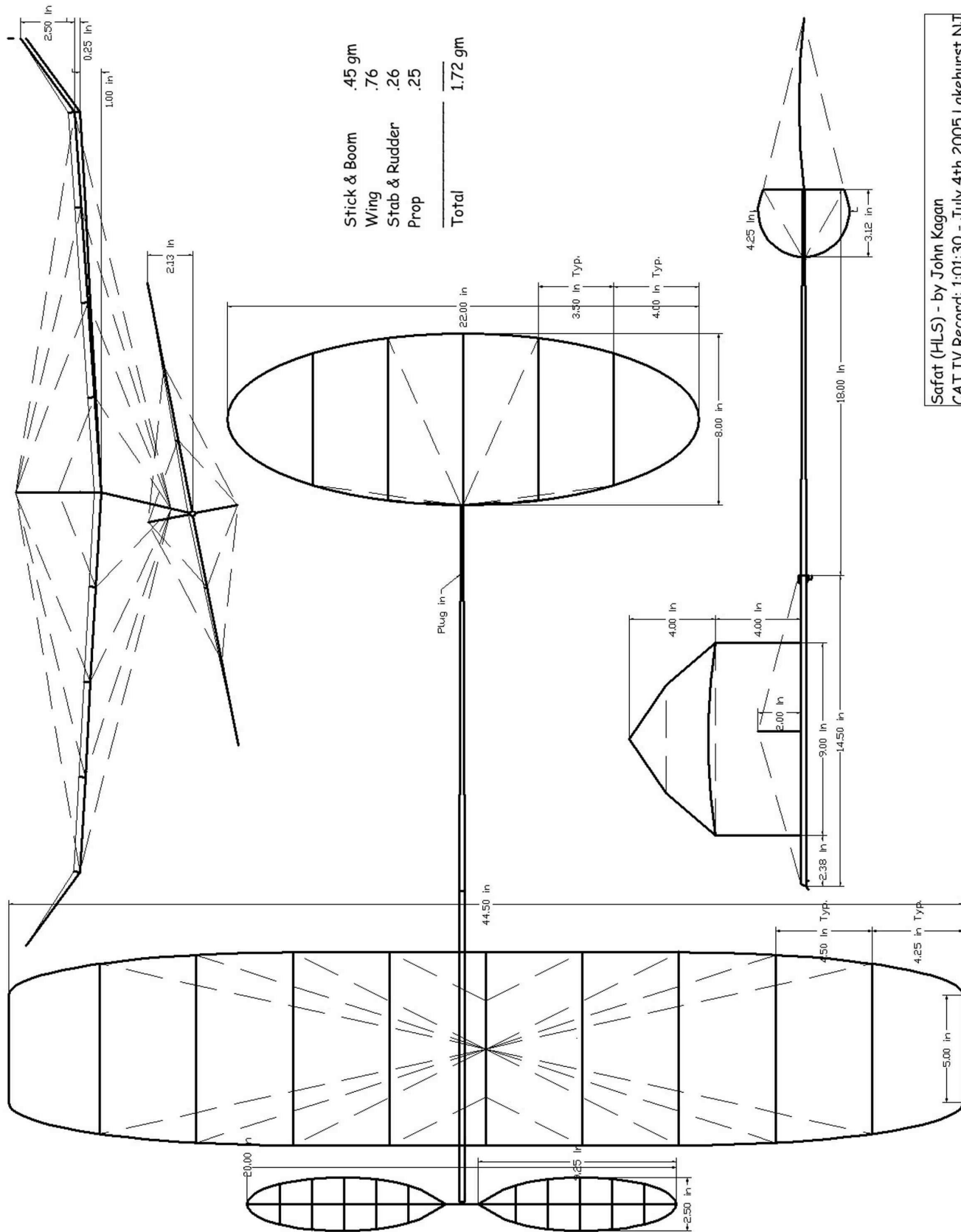
Safat (named after a mythical bird that never lands) was built from old, rejected F1D parts. The wing is from an old rules F1D with an extra center section, bringing the span up to 44". The stab is about the only part built specifically for this model. I decided to cover it with plastic film because I wanted my first HLS to be durable. With the plastic covering the all-up weight is a relatively hefty 1.72 grams. The plastic saved the wing many times over, including one flight where the model touched the girders at Lakehurst, tail slid, collapsed, and came down in a ball. I caught the model and the wing unfolded and popped back into place. A few spots of glue where spars broke and it was right back in the air.

I brought Safat along to the 2005 4th of July contest at Lakehurst mainly because I had to keep my F1D's together for the team selection finals less than a month away, and I needed something else to play with. Using an old 20" prop, I began with a few $\frac{1}{4}$ motor flights that were a consistent 14:15. I decided to put up a full motor flight to verify the results. The model came in with an expected 57:06, but I gained some valuable information: It only climbed about $\frac{3}{4}$ of the way up and it landed with 400 turns. There were some easy tweaks available, but the day was winding down so I packed up for the evening.

The next day I turned the high pitch down a bit and the $\frac{1}{4}$ motor flights increased to just around 14:45. - time to try another full motor flight! The model got higher, but still a comfortable 15' or so from the ceiling. It was around 3:00pm so the air was still moving around a bit and several steers were required to keep the model off the walls. The flight looked promising, but came up just short at 58:45. There were still 300 turns left, though.

Upon examination, the 22" x .071" 5/99 motor had a cut that was almost all the way through. Something beefier was needed anyway, so I cut the next motor at .074" and increased the length to 23". 3200 turns went in on the first wind and I decided to go with it. The high pitch was increased slightly because I didn't want the extra energy to take the model into the girders, and Safat was on its way. It was around 5:00pm and the air was much calmer – another beautiful Lakehurst evening. The model climbed to about the same altitude, still a comfortable distance from the ceiling, but was much higher at the 30 and 45 minute marks. Only about three steers were needed – one about halfway through, one a bit later, and a final one during the landing – totaling around 36 seconds.

This time Safat crossed the 1 hour mark about 15' up and settled in around 62:07. Subtracting the prop stop time gave 61:30 – a new record! The motor was about 2.1gm and the model was 1.72, so that should be a 1.22 rubber to model ratio. I used a 20" prop (pretty small), 3200 turns, 50 rpm average. The air was nice and calm. I don't think there were major thermals since the flights were pretty consistent and predictable across two days, but calm air counts for a lot. Max Zaluska and Matt Chalker were the official timers, but there were several others of us with watches on it. It was a novel experience to see all those zeros when it flipped over an hour!



2005 Midwestern States Championships Results

University of Illinois Armory, Saturday, April 2nd

The number in parenthesis indicates number of entries

H.L.G. (6)

1. Kurt Krempetz	97.2
2. Bill Gowen	65.5
3. Kenny Krempetz	39.1
4. Kenneth Krempetz	31.5

Std. Cat. Glider (9)

1. Bob Warmann	127.7
2. Chuck Markos	123.1
3. Kenny Krempetz	118.5
4. Kurt Krempetz	118.2
5. Kenneth Krempetz	116.5
6. Sid Harden	84.0
7. Earl Brockmeier	81.0

Unltd. Cat. Glider (8)

1. Kurt Krempetz	145.4
2. Kenneth Krempetz	128.8
3. Chuck Markos	117.9
4. Kenny Krempetz	115.2
5. Bill Gowen	96.7
6. Bob Warmann	72.6

Bostonian (5)

1. Bob Warmann	357
2. Bob Moulton	302

A6 (10)

1. Tom Sova	8:03
2. Bill Leppard	7:32
3. Nick Ray	4:30
4. Earl Brockmeier	3:55
5. Bob Moulton	2:33

NoCal (6)

1. Larry Loucka	6:24
2. Bill Leppard	3:23
3. Ed Konefes	2:30

Pennyplane (11)

1. Tom Sova	14:09
2. Bill Gowen	13:30
3. Jim Richmond	13:24
4. Fred Tellier	13:15
5. Larry Loucka	12:10
6. Bill Leppard	11:30

Ltd. Pennyplane (13)

1. Tom Sova	12:38
2. Bill Leppard (11:57)	12:24
3. Fred Tellier (11:12)	12:24
4. John Kagan	12:16
5. Bill Gowen	11:18
6. Delmar Johnson	9:33
7. Sid Harden	8:59
8. Chuck Markos	5:47

Ministick (13)

1. Bill Leppard	10:44
2. Tom Sova	8:36
3. Nick Ray	8:35
4. Jim Richmond	7:57
5. Kurt Krempetz	7:30
6. Larry Loucka	5:48

Wright Stuff(C)

1. Doug Schaefer	7:02
2. Matt Deleon	6:33
3. Eric Kato	5:18
4. Steven Gutzmer	4:13
5. Alex Gorodetsky	4:11

Wright Stuff "B"

1. Justin Young	5:15
2. Sean Green	5:14
3. Ruth Sanders	4:57

4. Alex Prodanovic	4:37
5. John Graven	4:31
6. Greg Wilk	4:21
7. Jessica Young	3:51

2005 Midwestern States Championships Results

Sunday, April 3rd

F1L (11)

1. Larry Loucka	33:47
2. Doug Schaefer	33:42
3. Bill Leppard	32:29
4. Geof Bower	29:52
5. Bill Gowen	29:51
6. John Kagen	28:57
7. Chuck Markos	28:16
8. Earl Brockmeier	26:38

Easy Bee (9)

1. Fred Tellier (19:13)	22:28
2. Jim Richmond (17:03)	22:28
3. Bill Leppard	20:18
4. Doug Schaefer	19:08
5. Bill Gowen	16:24
6. Tom Sova	16:14

F1D (5)

1. Fred Tellier	23:05
2. Justin Young	21:28
3. Tom Sova	19:28
4. Nick Ray	13:24
5. Geof Bower	0:15

ROG (3)

1. Larry Loucka	17:14
2. Tom Sova	16:09

Intermediate Stick (4)

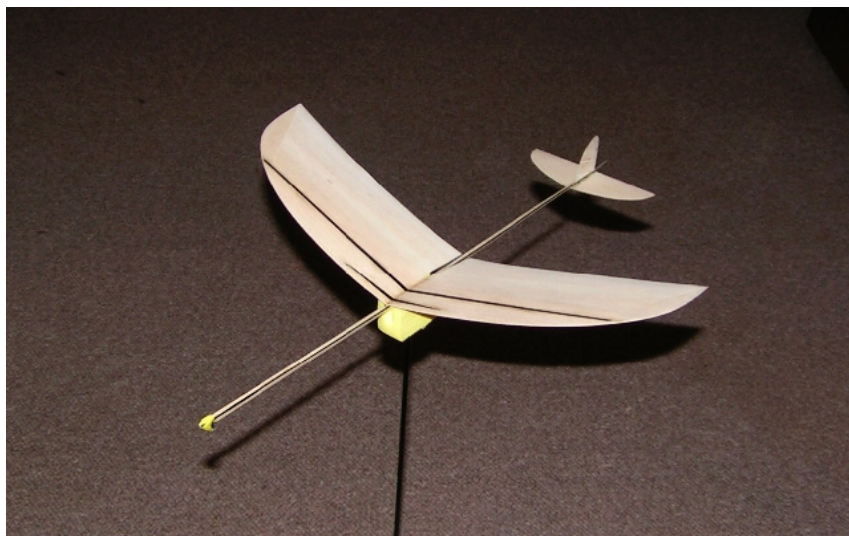
1. Bill Leppard	13:07
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Stanton Hi Point Trophy (14)

1. Tom Sova	19 pts.
2. Bill Leppard	18 pts.
3. Kurt Krempetz	13 pts.

Two Catagory III Records Applied for in F1L:

1. Senior, Doug Schaefer	17:59
2. Open, Larry Loucka	17:21



WIF?*

Standard Class Cat I Catapult Glider

* (Will It Float?)

WILLAMETTE MODELERS TWO DAY INDOOR MEET

ALBANY, OREGON APRIL 23, 24, 2005

It seemed that this contest followed the usual format of a wet and windy time. As we drove down to Albany from our home in the northwest part of the state, it rained most of the way, and nearing the city, it poured quite a bit. There were a few people already at the site, and waiting to get in. After the building was open, and the flyers started to file in, it became apparent that we didn't have as many flyers as usual. By the time we had set up the score sheets and the entry forms, we began to ask ourselves, "where is everybody." There are always a few stragglers, but even then it was obvious that we were going to have a very light turnout for this competition. We had our normal stalwarts like Chris Borland from Sacramento, but really missed our friend, Jerry Powell, from Yreka, California, who had passed away just recently. Jerry had been to the contest in February, and said he had a good report from his doctor about the cancer he had about five years ago. However, shortly after that, he experienced some pain, and was sent to surgery. Just a few days after that, he died from that cancer. He will be remembered for his friendliness and the quiet efficiency he demonstrated in flying his models. He used a computer, and his spread sheets on all phases of modeling were amazing. In the middle of the morning, we noticed a modeler coming in with his model boxes, and were very much surprised to see Frank Hirleman, from California. He said he had driven 800 miles to make this. contest. Frank had been a regular at our contests, and had formed a modeling group where he lived on the coast at Lincoln City. He had moved to Washington State, then to Auburn, California. Frank then told us that he had just purchased a home in Albany, and was here to stay. He told me that there was no place to fly, indoors or outdoors in Auburn, and wanted to be back where he could fly his fleet of models.

The group that was there had begun flying, with Tony Mula getting out his well adjusted models and flying them continually. He flies mostly sport and scale models, and all perform very well. We usually have the mornings divided into light and heavy model flying times, but with so few attending, we just let them fly when they wanted. I must say that these flyers were most courteous to each other, and watched carefully before launching to avoid collisions. The Science Olympiad flyers flew regularly, and I noticed a great amount of improvement in their construction methods, and the quality of their flying. A lot of credit for these improvements goes to Andrew Tagliafico and Ed Berray, as they have been mentoring two groups from the Vancouver, Washington area. They not only have middle and high school students, but also several of the parents have become interested, and have build other indoor models besides the Science Olympiad event. Andrew, Ed and myself have officiated in both the Washington State and Oregon State Science Olympiad competition events, and several students will be attending the National Championships with models designed by Andrew. We believe it is most important to help these young modelers if the sport is to be kept alive. We would like to encourage other modelers to volunteer to help in the Science Olympiad program in their schools. It was a great disappointment to officiate at the State Championships and see the low quality of models used by most of the contestants. We have found that the science teachers in these schools know virtually nothing about model construction or making the models fly. To help keep our hobby healthy, it is important that we try to develop these young students in the program.

The flying continued steadily all morning, and we must report that the Willamette Club was there to help and time on both days. There was spirited competition from the catapult and hand launched glider flyers, and especially in the catapult glider event. Ed Berray continues to dominate the event, but others are beginning to learn how to build and fly these models. Ed says the secret is to build them light--his weighs just 3 grams. Bob Stalick had one that weighed just a bit over that 3 gram figure, and when he gets a good pattern on his launch, he should give Ed a challenge. We noticed during the day, that the air seemed to be heavy and dead, but every once in a while it turned what I call "light and fluffy." The flying continued until 5 o'clock, when we broke for supper. We came back at six and began the symposium. First, Chris Borland, who does so well with the Science Olympiad models, showed us how he adjusts the pitch and shape of his propellers. The pitch on the props, as they are purchased, is too high. In order to change the pitch, Chris grasps the hub of the prop with two pairs of needle nose pliers and holds to unit over a lighted votive candle. When it softens a bit, he applies just the slightest pressure on both pliers to reduce the pitch. When asked how high to hold the prop above the candle, he said you have to experiment. It appeared that he held the unit about 4 inches from the flame. Chris also stressed that you need to check the pitch in each blade with a pitch gauge. Next, Ed Berray talked about building Science

Olympiad models. Picking out the right wood is important, and using a small amount of glue is necessary to keep the models at the minimum weight. Andrew Tagliafico then answered questions from the audience about various aspects of model construction. His answers were concise and right to the point, and made us realize his wealth of knowledge that he has accumulated in his years of modeling. The CD next asked the question of how do you find out the quality of rubber? In the publications, there have been different methods outlined, but the CD stressed that whatever method you use, it must be consistent. He pointed out that even in a one pound box of rubber there can be up to a 15% variation in energy. It would seem, therefore, to be important to test each batch at various points of the strands. The new batch of super sport rubber seems to be pretty good, and some of the flyers have ordered some to see just how good it **is**. Time will tell.

I'll cover some of the highlights of this competition, and despite the lower number of flyers, there were some interesting flights. One that will be remembered for a long time is the mass launch at noon on Sunday of the Science Olympiad models. There were nine models prepared, but Michael Altig broke a motor winding, as did his daughter, Rebecca. Michael gallantly gave his spare motor to his daughter, and she flew and did well. David Bufford had his model flying good during his test flights, but when he launched for the mass flyoff, his model inexplicably turned right and went into the wall. The rest, however, flew very well, and as the minutes ticked off it became apparent that three models would be very close when they touched down. Dick Trethway came in third in the mass launch, Andrew second, and Chris Borland won with a 4:38.

TWO DAY INDOOR MEET RESULTS

(Number of Entries in Parentheses)

A-6 EVENT (7)

1. John Lenderman 6:20
2. Ed Berray 6:15
3. Andrew Tagliafico 5:42

SCIENCE OLYMPIAD

1. Andrew Tagiafico 5:10
2. David Buford 4:40
3. Chris Borland 4:36

SCIENCE OLYMPIAD JR.

1. Jessica Bufford 4:15
2. Rebekah Altig 3:34

MINI-STICK (6)

1. Andrew Tagiafico 9:57
2. Ed Berray 9:38
3. David Buford 6:51

AMA 1.2 g EZB (4)

1. Andrew Tagiafico 6:22
2. John Lenderman 5:29
3. Ed Berray 5:28

EZB ¼ MOTOR (3)

1. John Lenderman 6:37
2. Ed Berray 6:07
3. Chris Borland 3:31

CATAPULT GLIDER (4)

1. Ed Berray 75.1
2. Bob Stalick 65.4
3. Chris Borland 56.3

HAND LAUNCH GLIDER (4)

1. Ed Berray 75.7
2. Tom Kopriva 62.1
3. Bob Stalick 58.3

BOSTONIAN (3)

1. John Lenderman 3:56
2. Tom Kopriva 2:22
3. Fred Smith 0:19

LIMITED PENNYPLANE (3)

1. John Lenderman 4:22
2. Chris Borland 4:18
3. Ed Berray 3:07

A-ROG (2)

1. Andrew Tagiafico 15:24
2. Ed Berray 4:08

NO-CAL SCALE (2)

1. Tom Kopriva 3:25

SCI OLYMPIAD MASS LAUNCH (9)

1. Chris Borland 4:58
2. Andrew Tagiafico 4:53
3. Dick Trethway 4:51

AMA SCALE (1)

1. Frank Hirlman :40.47

PEANUT SCALE (2)

1. Tom Kopriva 0:52

2005 UNITED STATES INDOOR CHAMPIOSHIPS, JOHNSON CITY, TENNESSEE**DAY ONE****Hand Launch Glider**

Name	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Flight 6	Flight 7	Flight 8	Flight 9	Best	2nd Best	Total	Place
Lewis, James P	69.1	65.1	67.2	75.8	70.0	5.0	30.5	65.0	58.0	75.8	70.0	145.8	1
Boehm, Bernard	65.7	59.8	57.7	63.8	64.8					65.7	64.8	130.5	2
Romash, Robert	63.8	65.7	64.8							65.7	64.8	130.5	3
Krempetz, Kurt	49.9	57.2	55.2	52.1	52.4	52.6	59.1	57.9	57.1	59.1	57.9	117.0	4
Ringlien, Andrew W	49.0	46.0	51.0	50.8	48.4	51.9	31.7	49.9	56.4	56.4	51.9	108.3	5
Krempetz, Kenny L	22.1	22.3								22.3	22.1	44.4	6

Standard Catapult Glider

Name	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Flight 6	Flight 7	Flight 8	Flight 9	Best	2nd Best	Total	Place
Warmann, Robert	8.6	67.7	74.6	77.2	81.2	70.1	80.8	80.3	76.1	81.2	80.8	162.0	1
Krempetz, Kurt	78.4	62.2	69.1	76.0	71.7	62.7	77.2	80.8	72.7	80.8	78.4	159.2	2
Schlarb, Ralph M	31.0	79.9	47.0	69.0	77.8	74.3	79.1	75.3	76.0	79.9	79.1	159.0	3
Johnson, Tem E	76.1	76.2	67.8	70.8	67.9	65.7	56.0			76.2	76.1	152.3	4
Romash, Robert	61.0	75.2	75.0	71.0						75.2	75.0	150.2	5
Jessup, Artie D	68.8	70.3	69.5	68.8	74.5	71.6	71.5	70.1	74.1	74.5	74.1	148.6	6
Miller, Richard J	54.9	72.0	69.3	65.6	60.6	68.7	68.8	69.8	63.2	72.0	69.8	141.8	7
Krempetz, Kenny L	68.4	66.9	59.9							68.4	66.9	135.3	8
Lewis, James P	68.3	23.1	11.0	65.0	64.2	64.4	64.8	61.4	66.7	68.3	66.7	135.0	9
Batte, Thomas C	49.9	47.6	59.4	56.4	42.1	51.0	60.7			60.7	59.4	120.1	10
Goins, Chris	64.3	10.3	46.1	53.7	12.4					64.3	53.7	118.0	11
Weckerly, Stuart P	15.0	11.0	44.1	54.3	5.2	55.6	51.2	41.6	56.0	56.0	55.6	111.6	12
Ringlien, Andrew W	40.1	10.4	37.6	41.1	48.7	36.3				48.7	41.1	89.8	13
Krempetz, Kenneth	3.5	49.4	40.1							49.4	40.1	89.5	14
Kelly, James R	15.6	25.0	6.2	30.6	18.4	3.8	30.4	34.3	35.9	35.9	34.3	70.2	15

Unlimited Catapult Glider

Name	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Flight 6	Flight 7	Flight 8	Flight 9	Best	2nd Best	Total	Place
Krempetz, Kurt	65.5	73.6	73.6	82.2	92.5	86.5	33.7	31.3		92.5	86.5	179.0	1
Schlarb, W L	31.0	86.0	27.0	76.5	42.0	73.2	51.0	65.0	59.0	86.0	76.5	162.5	2
Lewis, James P	45.0	78.4	77.2	45.0	7.0	77.8				78.4	77.8	156.2	3
Romash, Robert	77.1	77.5	78.1							78.1	77.5	155.6	4
Boehm, Bernard	69.0	70.9	71.9	70.3	77.5	77.7				77.7	77.5	155.2	5
Krempetz, Kenneth	63.6	67.8	65.0	26.5	73.3	80.6	63.1	68.1		80.6	73.3	153.9	6
Johnson, Tem E	67.6	74.2	16.3	71.2	44.0	67.7	75.1			75.1	74.2	149.3	7
Jessup, Artie D	70.5	67.4	64.5	71.7	74.7	70.3	58.5	55.7		74.7	71.7	146.4	8
Krempetz, Kenny L	9.1	69.6	61.6	66.0	64.5	65.2				69.6	66.0	135.6	9
Ringlien, Andrew	33.9	41.7	51.1	56.9	62.9	63.6	56.4	59.8	56.6	63.6	62.9	126.5	10
Gowen, William D	9.3	44.0	52.5	58.6	53.0	47.1	51.3	9.2	55.2	58.6	55.2	113.8	11
Weckerly, Stuart P	51.0	15.0	6.0	44.7						51.0	44.7	95.7	12
Batte, Thomas C	49.4	9.3	32.8	29.8						49.4	32.8	82.2	13

Round The Pole Speed

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Sova, Tom J	473169	3.40					3.40	1
Diebolt, H J	5286	3.38	2.77	2.99	2.79	2.89	3.38	2
Boone, Jack L	107857	3.35	3.08	2.73	2.73	2.74	3.35	3
Italiano, A J	2386	2.96	3.15	3.16	2.75	2.84	3.16	4

Unlimited Speed

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Boone, Jack L	107857	11.8	12.4	12.6	12.9	13.9	21:36:00	1
Diebolt, H J	5286	12.1	10.9				2:24:00	2

Straight Line Speed

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Lewis, James P	119	1.56	1.38				1.56	1
Sova, Tom J	473169	1.84					1.84	2
Diebolt, H J	5286	2.03	2.03				2.03	3

Race to the Roof

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Rash, Fred H	63458	0:00:51	0:00:21				0:00:51	1
Carney, Bill	83252	0:00:24					0:00:24	2
Diebolt, H J	5286	0:00:13					0:00:13	3
Harlan, Raymond B	131	0:00:11					0:00:11	4

Intermediate Stick

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Loucka, Larry	1210	0:30:24	0:36:46				0:36:46	1
Richmond, James W	4936	0:32:52					0:32:52	2
Harlan, Raymond B	131	0:29:47	0:09:05				0:29:47	3
Tellier, Fred	9125	0:14:43	0:22:10	0:26:50			0:26:50	4
Olshefsky, Peter	864L	0:19:39	0:18:18	0:06:11			0:19:39	5
Barker, John	2095	0:12:05	0:16:17	0:17:06	0:13:57	0:16:30	0:17:06	6
LeBlanc John	271521	0:10:54	0:11:38	0:13:17	0:15:32	0:16:04	0:16:04	7

F1D

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Flight 6	Best	2nd Best	Total	Place
Richmond, James W	4936	0:31:49	0:27:21	0:31:26	0:32:02	0:33:58	0:33:31	0:33:58	0:33:31	1:07:29	1
Cailliau, Lawrence L	79985	0:33:17	0:10:24	0:33:31	0:29:53			0:33:31	0:33:17	1:06:48	2
Kagan, John	469254	0:31:58	0:17:32	0:32:30	0:32:12			0:32:30	0:32:12	1:04:42	3
Sova, Tom J	473169	0:30:54	0:31:29	0:32:05	0:30:46			0:32:05	0:31:29	1:03:34	4
Tellier, Fred	9125	0:31:08	0:30:06	0:28:31	0:30:02	0:30:39	0:30:38	0:31:08	0:30:39	1:01:47	5
Sanborn, Brett D	748651	0:23:55	0:24:32	0:25:01	0:20:54	0:28:17	0:27:07	0:28:17	0:27:07	0:55:24	6
Bennett, Mark	475698	0:27:38	0:27:38	0:12:29				0:27:38	0:27:38	0:55:16	7
Brown, Stephen H	128759	0:06:15	0:27:10	0:06:49	0:27:20			0:27:20	0:27:10	0:54:30	8
Zaluska, Max	774565	0:22:59	0:27:09					0:27:09	0:22:59	0:50:08	9
Raymond-Jones, D.C.	13157	0:18:48	0:23:28	0:23:58				0:23:58	0:23:28	0:47:26	10
Goins, Christopher D	800982	0:07:38	0:19:12	0:17:50	0:21:58	0:25:14		0:25:14	0:21:58	0:47:12	11
Olshefsky, Peter	864L	0:19:45	0:21:25	0:22:35	0:20:56	0:20:21	0:10:45	0:22:35	0:21:25	0:44:00	12
Barker, John	2095	0:11:33	0:14:56	0:15:33	0:12:05	0:18:20	0:19:02	0:19:02	0:18:20	0:37:22	13
Kottapalli, Anjaney P	753462	0:18:24	0:17:05	0:09:10				0:18:24	0:17:05	0:35:29	14
Combs, Jerry A	5471	0:08:54	0:14:23	0:15:18				0:15:18	0:14:23	0:29:41	15
Kehr, Joe D	549294	0:11:26						0:11:26		0:11:26	16

35 Centimeter

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Sova, Tom J	473169	0:24:50	0:27:57				0:27:57	1
Sanborn, Brett D	748651	0:02:42	0:27:12	0:26:14	0:27:14		0:27:14	2
Harlan, Raymond B	131	0:26:14	0:26:35				0:26:35	3
Zaluska, Max	774565	0:24:57	0:20:52	0:25:35			0:25:35	4
Leppard, William R	93740	0:17:59	0:24:33				0:24:33	5
Raymond-Jones, D.C.	13157	0:23:29	0:15:39	0:08:04			0:23:29	6
Loucka, Larry	1210	0:23:14	0:23:23				0:23:23	7
Combs, Jerry A	5471	0:06:29	0:16:06	0:15:17	0:17:29		0:17:29	8

DAY TWO

Bostonian

Name	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	2nd Best	Flt Total	Charisma	Total	Place
Schutzell, Emil J	0:05:14	0:05:14	0:05:25	0:04:30		0:05:25	0:05:14	0:10:39	1.20	0:12:47	1
Miller, Richard J	0:05:12	0:03:32	0:03:53			0:05:12	0:03:53	0:09:05	1.14	0:10:21	2
Barker, John	0:02:46	0:03:39	0:04:29	0:04:07	0:03:52	0:04:29	0:04:07	0:08:36	1.10	0:09:28	3
Young, Lou S	0:03:36	0:03:39	0:03:44	0:03:40	0:03:53	0:03:53	0:03:44	0:07:37	1.18	0:08:59	4
Diebolt, H J	0:04:07	0:01:21	0:02:43	0:03:41		0:04:07	0:03:41	0:07:48	1.15	0:08:58	5
Rash, Fred H	0:01:45	0:02:32	0:03:00	0:03:21	0:03:27	0:03:27	0:03:21	0:06:48	1.08	0:07:21	6
Blair, John C	0:01:28	0:01:27	0:01:36	0:02:01	0:02:04	0:02:04	0:02:01	0:04:05	1.16	0:04:44	7

High Wing Monoplane

Name	AMA #	Aircraft	Score	Place
McGillivray, Jack	1025	Found CF 100	144	1
Miller, Richard J	179518	Lacey	135	2
Miller, James I	89382	Lacey	123	3
Blair, John C	29698	Alco Sport	122.5	4

Modern Civil Production

Name	AMA #	Aircraft	Score	Place
McGillivray, Jack	1025	Found	354	1
Weckerly, Stuart P	13250	Found	306	2
Miller, James I	89382	Found	161	3

Hand Launch Stick

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Richmond, James W	4936	0:38:23					0:38:23	1
Kagan, John	469254	0:25:10					0:25:10	2
Young, Lou S	3304	0:09:00	0:15:44	0:19:11			0:19:11	3

AROG

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Loucka, Larry	1210	0:19:49	0:09:50	0:19:38	0:16:58	0:20:59	0:20:59	1
Harlan, Raymond B	131	0:20:21	0:19:01	0:20:50			0:20:50	2
Sova, Tom J	473169	0:13:36	0:15:58	0:17:29	0:18:57		0:18:57	3
Kehr, Joe D	549294	0:11:26	0:10:19	0:10:45	0:12:38	0:13:46	0:13:46	4
Diebolt, H J	5286	0:10:13	0:09:26	0:10:53	0:11:35	0:02:58	0:11:35	5
Rash, Fred H	63458	0:05:23	0:09:33	0:09:25			0:09:33	6

DAY THREE

Dime Scale

Name	AMA #	Aircraft	Score	Place
Miller, Richard J	179518	Bat Mono	375	1
Diebolt, H J	5286	Bat Mono	375	2
Blair, John C	29698	Glouster Gannet	260	3
Barker, John	2095	Curtis Robin	237	4
Hodson, Gary	669378	Fleet Trainer	227	5
Kish, J.P.	9803	Corburn	118	6
Carney, Bill	83252	Fairchild 24	106	7

Golden Age

Name	AMA #	Aircraft	Score	Place
Weckerly, Stuart P	13250	Stout 2AT	360	1
McGillivray, Jack	1025	SE5A	290	2
Blair, John C	29698	Waco C6	274	3

AMA Peanut

Name	AMA #	Static	Flight 1	Flight 2	Flight 3	Flight 4	Best	2nd Best	Total	Place
Hodson, Gary	669378	125	125.0	125.0			125.0	125.0	250.0	1
Miller, James I	89382	99	86.0	84.0			86.0	84.0	184.0	2
Blair, John C	29698	94	86.0	79.0	82.0		86.0	82.0	178.0	3

Ministick

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Loucka, Larry	1210	0:12:10	0:12:04	0:10:59	0:11:59	0:13:09	0:13:09	1
Romash, Robert	130061	0:12:08	0:05:47	0:12:13	0:12:45	0:12:57	0:12:57	2
Van Gorder, Walter P	19912	0:10:42	0:11:58	0:12:39	0:12:32	0:11:53	0:12:39	3
DeLoach, Don A	175015	0:10:05	0:12:13	0:12:19	0:11:38	0:11:47	0:12:19	4
Schutzel, Emil J	508384	0:11:13	0:09:19	0:09:33	0:12:07		0:12:07	5
Rash, Fred H	63458	0:09:33	0:10:42	0:11:49	0:08:49	0:03:38	0:11:49	6
Leppard, William R	93740	0:10:51	0:11:34				0:11:34	7
Cohen, Alan M	738608	0:11:25					0:11:25	8
Sova, Tom J	473169	0:08:38	0:09:11	0:11:11	0:10:20	0:10:43	0:11:11	9
Kehr, Joe D	549294	0:10:48	0:09:01	0:08:53	0:09:17	0:10:09	0:10:48	10
Richmond, James W	4936	0:10:26					0:10:26	11
Harlan, Raymond B	131	0:10:16					0:10:16	12
Sanborn, Brett D	748651	0:10:05	0:06:44	0:09:31	0:08:39		0:10:05	13
Brown, Stephen H	128759	0:10:01					0:10:01	14
Hodson, Gary	669378	0:10:01	0:02:35	0:08:32	0:09:50		0:10:01	14
Diebolt, H J	5286	0:02:07	0:09:05	0:09:52			0:09:52	16
Combs, Jerry A	5471	0:09:32	0:08:48	0:08:46			0:09:32	17
LeBlanc John	271521	0:08:06	0:08:45	0:08:07	0:08:18	0:09:08	0:09:08	18
Goins, Christopher D	800982	0:08:33	0:07:47	0:01:40			0:08:33	19
Olshefsky, Peter	864L	0:07:11	0:07:50	0:07:19	0:06:52	0:03:35	0:07:50	20
Nuszer, Joseph B	29036	0:05:43	0:07:26	0:07:05	0:07:28		0:07:28	21
Ray, Nicholas A	770974	0:06:22	0:06:33				0:06:33	22
LeBlanc, Christopher	778968	0:02:31	0:03:48	0:04:10	0:02:47	0:04:13	0:04:13	23

EZB

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Richmond, James W	4936	0:28:13	0:23:08	0:28:45			0:28:45	1
Zaluska, Max	774565	0:24:03	0:24:08	0:27:12	0:27:24	0:28:26	0:28:26	2
Cailliau, Lawrence L	79985	0:22:24	0:26:26	0:22:37	0:26:45	0:14:50	0:26:45	3
Kagan, John	469254	0:25:52	0:08:06	0:25:26	0:25:19		0:25:52	4
Cohen, Alan M	738608	0:22:13	0:25:25	0:19:48	0:24:08	0:23:11	0:25:25	5
Tellier, Fred	9125	0:19:23	0:01:08	0:24:24			0:24:24	6
Gowen, William D	6157	0:21:04	0:23:00	0:20:03	0:18:16		0:23:00	7
Morrow, Christopher R	546510	0:22:05	0:14:17	0:15:45	0:17:21	0:19:16	0:22:05	8
Lemel, A L	5028	0:19:26	0:19:36	0:20:05	0:16:27	0:17:53	0:20:05	9
Leppard, William R	93740	0:17:16	0:18:27				0:18:27	10
Harlan, Raymond B	131	0:09:30	0:18:20				0:18:20	11
Nuszer, George	0	0:17:58					0:17:58	12
Barker, John	2095	0:11:02	0:13:22	0:17:15			0:17:15	13
Carney, Bill	83252	0:14:41	0:15:15	0:06:48			0:15:15	14
Italiano, A J	2386	0:11:54	0:07:59	0:11:58	0:08:38		0:11:58	15
Raymond-Jones, D.C.	13157	0:11:14					0:11:14	16
LeBlanc John	271521	0:06:32					0:06:32	17

FIL

Name	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Flight 6	Best	2nd Best	Total	Place
Leppard, William R	0:17:57	0:17:12	0:18:32	0:19:05			0:19:05	0:18:32	0:37:37	1
Tellier, Fred	0:19:21	0:17:11	0:16:40	0:07:00	0:17:40	0:16:57	0:19:21	0:17:40	0:37:01	2
Gowen, William D	0:17:43	0:13:02	0:17:32	0:14:55			0:17:43	0:17:32	0:35:15	3
Sova, Tom J	0:15:46	0:16:51	0:17:50	0:17:08			0:17:50	0:17:08	0:34:58	4
Raymond-Jones, D.C.	0:17:54	0:11:00	0:14:51	0:13:59	0:13:04	0:08:24	0:17:54	0:14:51	0:32:45	5
Deloach, Don A	0:08:34	0:11:10	0:15:36	0:16:44	0:15:37	0:13:50	0:16:44	0:15:37	0:32:21	6
Romash, Robert	0:15:08	0:16:08	0:14:52	0:11:05			0:16:08	0:15:08	0:31:16	7
Combs, Jerry A	0:13:33	0:15:22	0:15:52	0:03:50			0:15:52	0:15:22	0:31:14	8
Landrum, Billie E	0:11:55	0:13:37	0:15:03	0:15:36	0:09:30		0:15:36	0:15:03	0:30:39	9
Kehr, Joe D	0:10:44	0:15:27	0:15:04	0:05:07			0:15:27	0:15:04	0:30:31	10
Olshefsky, Peter	0:15:04	0:08:34					0:15:04	0:08:34	0:23:38	11
Barker, John	0:08:50	0:08:42					0:08:50	0:08:42	0:17:32	12
Wrzos, Chester	0:07:31	0:08:19					0:08:19	0:07:31	0:15:50	13

DAY FOUR**Science Olympiad C, 2 gram rubber**

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Goins, Christopher D	800982	0:07:27	0:07:39	0:08:24	0:09:23		0:09:23	1
Sanborn, Brett D	748651	0:06:53	0:07:11	0:07:05			0:07:11	2
Warmann, Robert	187	0:06:31	0:06:14				0:06:31	3
Hodson, Gary	669378	0:04:50					0:04:50	4
Snow, Mary	0	0:03:51	0:04:09	0:04:13	0:04:17		0:04:17	5
Uliana, Joshua	0	0:00:31					0:00:31	6

Science Olympiad C, Unlimited rubber

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Sanborn, Brett D	748651	0:08:56	0:08:10	0:08:47			0:08:56	1
Diebolt, H J	5286	0:05:35	0:06:03	0:06:15	0:05:48		0:06:15	2
Uliana, Joshua	0	0:01:39	0:01:24	0:01:51			0:01:51	3

NoCal Scale

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Loucka, Larry	1210	0:05:32	0:06:39				0:06:39	1
Diebolt, H J	5286	0:05:32	0:04:15	0:04:33			0:05:32	2
Combs, Jerry A	5471	0:02:51	0:03:33				0:03:33	3
Warmann, Robert	187	0:02:50	0:03:28				0:03:28	4
Carney, Bill	83252	0:01:31	0:01:23				0:01:31	5
Blevins, Doyle	523646	0:01:24	0:00:45	0:01:06	0:00:45	0:01:15	0:01:24	6
Oleson, Douglas D	480646	0:01:06	0:01:05	0:00:42	0:01:15	0:01:12	0:01:15	7

Pennyplane

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Harlan, Raymond B	131	0:16:54	0:15:34	0:17:13	0:17:58		0:17:58	1
Richmond, James W	4936	0:17:44					0:17:44	2
Olshefsky, Peter	864L	0:14:24	0:14:33	0:15:08	0:15:26	0:17:35	0:17:35	3
Leppard, William R	93740	0:16:38	0:15:41	0:17:13	0:16:40	0:16:38	0:17:13	4
Deloach, Don A	175015	0:13:52	0:13:41	0:15:40	0:05:08	0:16:21	0:16:21	5
Gowen, William D	6157	0:13:22	0:15:19	0:16:10	0:08:40	0:15:05	0:16:10	6
Tellier, Fred	9125	0:13:58	0:16:00	0:13:10	0:14:41		0:16:00	7
Diebolt, H J	5286	0:14:43	0:15:07	0:15:54	0:04:00		0:15:54	8
Sova, Tom J	473169	0:15:17	0:15:45				0:15:45	9
Loucka, Larry	1210	0:13:56	0:15:44				0:15:44	10
Kagan, John	469254	0:15:02	0:15:16				0:15:16	11
Nuszer, Joseph B	29036	0:14:22	0:14:33	0:11:15	0:12:28	0:12:46	0:14:33	12
Kehr, Joe D	549294	0:10:58	0:05:32	0:11:19	0:13:22	0:12:25	0:13:22	13
Landrum, Billie E	52674	0:12:50	0:10:39				0:12:50	14
Carney, Bill	83252	0:12:48	0:11:24	0:12:23	0:11:42	0:11:58	0:12:48	15
Weckerly, Stuart P	13250	0:09:34	0:12:20	0:12:40	0:08:22	0:07:46	0:12:40	16
Warmann, Robert	187	0:06:55	0:11:40				0:11:40	17
Italiano, A J	2386	0:06:58	0:06:53	0:07:47	0:07:06	0:08:52	0:08:52	18
Johnson, Tem E	16707	0:06:25	0:06:24				0:06:25	19
Zaluska, Max	774565	0:03:19					0:03:19	20

Manhattan

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Van Gorder, Walter P	19912	0:11:29	0:13:26				0:13:26	1
Schutzel, Emil J	508384	0:12:27	0:10:08	0:07:10			0:12:27	2
Loucka, Larry	1210	0:06:56					0:06:56	3
Weckerly, Stuart P	13250	0:05:46	0:06:54	0:05:34	0:01:23		0:06:54	4

Ornithopter

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Harlan, Raymond B	131	0:13:14					0:13:14	1
Diebolt, H J	5286	0:04:03	0:04:52				0:04:52	2
Combs, Jerry A	5471	0:01:01	0:01:41	0:01:42			0:01:42	3

A-6

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Hodson, Gary	669378	0:10:07	0:08:31				0:10:07	1
Sova, Tom J	473169	0:08:32	0:09:31	0:02:37	0:09:29	0:09:59	0:09:59	2
Schutzel, Emil J	508384	0:09:26	0:09:02	0:07:40	0:09:57		0:09:57	3
Johnson, Tem E	16707	0:07:22	0:08:57	0:09:10	0:08:42		0:09:10	4
Combs, Jerry A	5471	0:06:10	0:07:49				0:07:49	5
Ray, Nicholas A	770974	0:07:18					0:07:18	6
Nystrom, Hank	71542	0:02:47	0:04:29	0:05:52	0:06:34	0:06:13	0:06:34	7
Deloach, Don A	175015	0:06:28	0:05:08				0:06:28	8

Diebolt, H J	5286	0:06:15				0:06:15	9
Sanborn, Brett D	748651	0:05:10	0:03:51			0:05:10	10
Kehr, Joe D	549294	0:04:10				0:04:10	11
LeBlanc Benjamin	778969	0:01:12	0:01:07	0:01:4	0:01;23	0:01:23	12
LeBlanc John	271521	0:01:07				0:01:07	13

DAY FIVE

Limited Pennyplane

Name	AMA #	Flight 1	Flight 2	Flight 3	Flight 4	Flight 5	Best	Place
Sova, Tom J	473169	0:13:38	0:14:25	0:13:39	0:13:54		0:14:25	1
DeLoach, Don A	175015	0:11:31	0:13:48	0:14:25	0:13:16		0:14:25	2
Zaluska, Max	774565	0:13:52	0:13:51	0:14:21	0:14:20	0:14:09	0:14:21	3
Tellier, Fred	9125	0:12:25	0:13:48	0:14:10	0:13:55		0:14:10	4
Sanborn, Brett D	748651	0:13:13	0:14:09	0:04:31	0:13:48		0:14:09	5
Van Gorder, Walter P	19912	0:14:03	0:05:15	0:04:09			0:14:03	6
Leppard, William R	93740	0:11:11	0:12:32	0:13:26			0:13:26	7
Olshefsky, Peter	864L	0:13:02	0:08:12	0:11:57	0:12:36	0:03:17	0:13:02	8
Carney, Bill	83252	0:11:23	0:11:09	0:13:01	0:11:54	0:12:28	0:13:01	9
Warmann, Robert	187	0:10:32	0:12:52	0:12:43	0:11:29	0:12:31	0:12:52	10
Gowen, William D	6157	0:12:41	0:03:51	0:12:02			0:12:41	11
Nuszer, Joseph B	29036	0:11:01	0:12:01	0:12:01	0:10:20		0:12:01	12
Young, Lou S	3304	0:09:54	0:11:33	0:11:55	0:03:56	0:11:51	0:11:55	13
Combs, Jerry A	5471	0:10:12	0:04:23	0:10:18	0:11:22		0:11:22	14
Campbell, Dann M	346641	0:09:54	0:10:29	0:10:03	0:02:40	0:10:47	0:10:47	15
Barker, John	2095	0:09:07	0:07:16	0:08:38	0:10:38	0:10:38	0:10:38	16
Diebolt, H J	5286	0:09:43	0:09:38	0:10:33			0:10:33	17
Italiano, A J	2386	0:07:12	0:07:03	0:05:55	0:09:34	0:09:49	0:09:49	18
Raymond-Jones, D.C.	13157	0:09:06	0:06:28	0:07:22	0:07:13	0:06:46	0:09:06	19
Boone, Jack L	107857	0:06:20	0:08:12	0:08:14	0:08:29		0:08:29	20
Kehr, Joe D	549294	0:08:24					0:08:24	21
Batte, Thomas C	693871	0:06:53	0:06:34	0:08:14	0:07:37		0:08:14	22
Wrzos, Chester	20454	0:05:27	0:08:10				0:08:10	23
Landrum, Billie E	52674	0:07:30	0:07:15				0:07:30	24
LeBlanc, Christopher	778968	0:06:09	0:06:33	0:06:09	0:06:12	0:07:24	0:07:24	25
LeBlanc, Nicolai	838153	0:02:27	0:02:20	0:02:44	0:03:57	0:03:16	0:03:57	26
Oleson, Douglas D	480646	0:00:23	0:03:42				0:03:42	27
LeBlanc Benjamin	778969	0:02:35	0:02:40	0:02:37	0:03:29	0:03:23	0:03:29	28
Bigge, William R	L127	0:00:15					0:00:15	29

FIM

Cailliau, Larry	79985	0:15:40	0:18:06	0:19:02	0:17:57	0:17:59		0:19:02	0:18:06	0:37:08	1
Gowen, William	6157	0:16:41	0:17:41	0:18:25	0:18:41	0:17:40	0:06:49	0:18:41	0:18:25	0:37:06	2
Tellier, Fred	9125	0:17:35	0:17:49	0:17:47	0:17:48	0:16:07	0:17:54	0:17:54	0:17:49	0:35:43	3
Leppard, William	93740	0:16:40	0:16:48					0:16:48	0:16:40	0:33:28	4
Olshefsky, Peter	864L	0:13:33	0:13:47					0:13:47	0:13:33	0:27:20	5
Ray, Nicholas A	770974	0:09:11	0:13:20	0:04:44				0:13:20	0:09:11	0:22:31	6
Combs, Jerry A	5471	0:11:03	0:10:20	0:10:18	0:09:40	0:08:29		0:11:03	0:10:20	0:21:23	7
Kehr, Joe D	549294	0:10:09	0:02:18	0:04:44				0:10:09	0:04:44	0:14:53	8

GLEANED FROM THE YAHOO INDOOR LIST

Lakehurst did have a good turnout. As a club though we could use a little help in the CD department. Although we had a few glitches over the 4th concerning CDs and records just on Saturday, it ended up being very minor in the end and no problem.

For next year, though, anyone with a CD status that would like to be a CD and can stay all day (9 am until past 8pm) etc. on a specific contest day please contact me. We are in need for the sanction weekends as well as contests, as it's difficult for me to fly in for all of them from Colorado and not cheap either. I would like to make Lakehurst a bulletproof record setting site, but need people to step up ahead of time.

I would also like to add specific days where FAI record attempts are set up in advance, this would be good for the 4th of July weekend, as the air is historically good then. ECIM as a club will pick up the tab for the proper paperwork for FAI as it has always done for AMA sanctions and contests. In the past club members who didn't have a CD rating were strongly encouraged to get one, I would like to do so again.

How does one get a CD "rating"? You take an open book test from the AMA. Its easy. Just give them a call at 800 435 9262. They will send you out the test.

Thanx, Rob Romash

Editor's Note: Rob is a model designer, and gave up a job with Mattel in NJ to go to work for Estes in Colorado. As President-For-Life of the East Coast Indoor Modelers, he now has to fly back to NJ for these events. He is happy to do it, but help with the contests would be appreciated. You can reach him by writing to 1442 Kirkham St., Colorado Springs, CO 80910, calling him after work at 710-359- 6999, or e-mailing him at romash5@yahoo.com.

AND FROM OUR READERS

Dear Carl,

I just read the piece by Andras Ree in the # 116 issue of Indoor News & Views, about the merit of the changes to the F1D specification.

Whilst I agree with most of what has happened to the benefits of easier/smaller travel boxes, and model weight changes, my experience and observations are telling me that we now have a problem with this class. The problem is the tiny 0.6 gram motor allowance.

Sure all the other benefits are worthwhile, but because of the small rubber weight allowed, models are wound and flown to the point of destruction too often, in order to make the longest flights. Also, highly technical variable pitch hubs are a must, as well as the high output Tan-2 rubber no longer made. These things are not good for the beginner, and even I as an experienced F1D flyer, find it hard to compete.

I would strongly recommend that we increase the allowed rubber weight upwards to say 1.00 gram, and this would make this class less of an "experts" only event. I loved F1D as it was, with its graceful slow flight and unstressful operation, as compared to today's "rocket" launches and contorted airframes.

Yours Truly (Giving up F1D today ?)

Laurie Barr. FSMAE.

INDOOR DURATION AT BORDEAUX, FRANCE

The Bordeaux Open International once again attracted a British contingent together with flyers from Spain, Germany and a group from the Czech Republic.

The contest was later this year, being held on the 25th and 26th of June. This year Bob Bailey joined Mike and Ann Green on the Euro Star and TGV, leaving London at approx. 8.30 in the morning and arriving in Bordeaux at 6pm the same day. This is the means of travel to be taken by the British team and supporters for the European Championships also to be held in Bordeaux Velodrome in October. Clive and Cindy King took the slow road combining the contest with a holiday. Geoffrey Lefever accompanied by daughter Jane and her partner Tony made the journey by car staying on after the contest to visit elder daughter Claire who now lives in Lot. It was good to see John Tipper and Paula there again.

Mid-summer in Southwest France is usually hot and this year was no exception. Temperatures inside the Velodrome rose to the high 30's Centigrade with a high level of humidity. The welcome was as warm as ever making this one of the most enjoyable Internationals: the relaxed atmosphere, long lunch breaks and repas de gala, together with the meeting up with old friends.

The Velodrome extends to a height of approx. 70 feet and is capped with a pyramid making a total height in the order of 100 feet. Models tend to centralize within the pyramid and 'mid-air's' are a constant hazard. It will be interesting to see the effect of this during the hectic activity expected at the European Championships.

Bob Bailey returned home with his usual complement of hardware. Mike Green had an excellent contest winning F1M and producing the highest time recorded within the Velodrome for F1L. On this occasion Clive King and Geoffrey Lefever faired less well, plagued by mid-air's. It was good to see Uwe Blundesen from Germany in the Velodrome for the first time. Also Daniel Medina and Diaz Manuel Angel from Spain once again. The Czech contingent included Mikita Kaplan together with his daughters Clara and Gabriella who both flew F1D's.

RESULTS

F1L

No. 1	Bob Bailey	22.53 22.38 Total 45.31
No. 2	Mike Green	23.15 18.47 Total 42.02
No. 3	John Tipper	20.48 19.21 Total 40.09
No. 4	Daniel Medina	21.08 18.54 Total 40.02

35cm

No. 1	Bob Bailey	33.00 20.16 Total 53.16
No. 2	Daniel Medina	25.39 23.22 Total 49.01
No. 3	Francis Frugoli	23.14 22.54 Total 46.08
No. 4	John Tipper	26.02 17.24 Total 43.26

F1M

No. 1	Mike Green	17.12 17.02 Total 34.14
No. 2	Uwe Blundesen	16.17 15.43 Total 43.00
No. 3	Trung Hua-Ngoc	15.42 15.08 Total 30.50
No. 4	Geoffrey Lefever	15.34 15.08 Total 30.42

F1D

No. 1	Bob Bailey	31.52 31.32 Total 63.24
No. 2	Mikita Kaplan	30.01 28.42 Total 58.43
No. 3	Didier Barberis	28.52 28.03 Total 56.55
No.4	Uwe Blundeson	28.54 26.58 Total 55.52

British Team Selection Finals

July 23, 24 Cardington, England

The team selection trials for the World Championships in 2006 took place over the weekend of 23rd 24th July. The forecast for the Saturday was for dry and calm weather and for rain later on the Sunday. The Saturday proved to be cold and damp. On a good day in Cardington gently rising air leaves the shed through the numerous holes in the roof. On this day cold air appeared to be falling through the roof. Models lost height at an alarming rate. Derek Richards had an excellent let down from a modest height and a result of a perfectly adjusted variable pitch propeller. His score was the only reasonable one. The rest of the flyers were embarrassed in no small degree by their times. The second day for the trials was abandoned early on with the rains forecast for before mid-day and conditions obviously even worse than those on Saturday. None of the flyers thought that they would be able to improve on their times and no one wished to fly. The team which will be travelling to the Romanian salt mines in October 2006 will be the same as for the last European Championships held in the Millennium Dome in 2003. Derek Richards, Nick Aikman and Geoffrey Lefever.

Bob Bailey had chosen to fly in the Kibbie Dome in Northwest USA over this weekend having no wish to endure the Slanic mine yet again.

The meeting was most disappointing however it did serve to produce a team.

RESULTS

No. 1	Derek Richards	30.01	30.30	31.53	Total 62.23
No. 2	Nick Aikman	23.36	27.22	25.54	Total 53.16
No. 3	Geoffrey Lefever	24.29	26.15	-	Total 50.44
No. 4	Laurie Barr	20.46	22.38	25.13	Total 47.51
No. 5	Clive King	21.56	19.00	-	Total 40.56
No. 6	John Shaw	16.23	18.55	19.25	Total 38.20

Late in August Bob Bailey, Nick Aikman, Clive King and Geoffrey Lefever will be flying off to Belgrade to sample the Trade Fair Centre of approx. 72 feet in height and to fly in the Open International for the Drocac Cup. This site is scheduled to be the venue for the 2007 Championships.

- Geoffrey Lefever



Derek Richards at 2005 Eurochamps



Lutz Schramm at 2005 Eurochamps

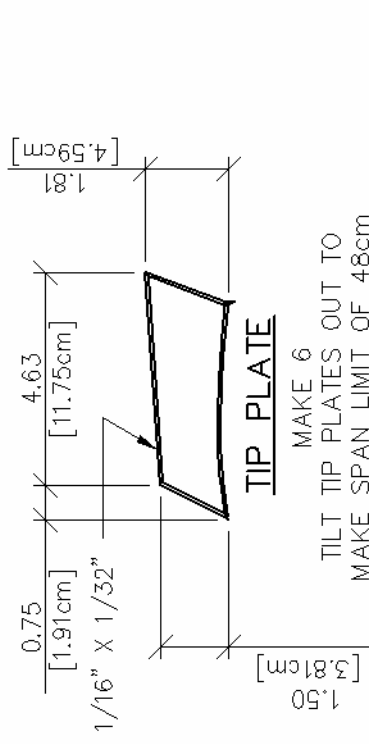
“Double Trouble” for Science Olympiad

By Chris Goins

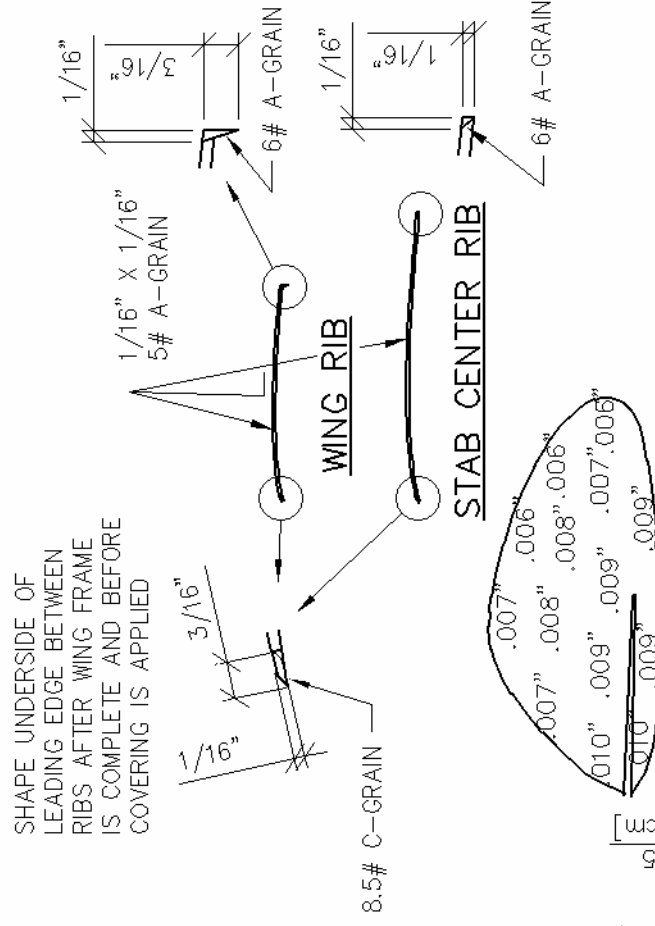
I got started with indoor free flight in middle school, when I built my first Peck Polymers ROG for Science Olympiad. That was a long time ago, and what I've learned since then is reflected in my latest effort, Double Trouble. I have always enjoyed this class - the models are built like tanks, but they still fly nice and slow. The rules are simple, yet open enough to allow some creative license. I was excited when the rules-writers decided to allow biplanes and plastic film for covering. This, in combination with the larger diameter prop left in from last year's rules cycle, gives the class excellent performance potential. The design of this airplane is something of an exercise in creative aerodynamics. Low profile semi-elliptical leading edge spars (a natural progression from a Banks style sharp LE) are used throughout, with the wing trailing edge spars oriented vertically to create small gurney flaps. The wings and tail are all flat with canted tip plates. I've been building models like this ever since Bill Gowen introduced me to them. The model is quite long, with all three flying surfaces separated as much as possible. The mean tail chord is increased to take advantage of a hole in the rules, and the center of gravity is set about half a chord-width behind the rear wing post. The model was originally built for low ceiling flying, so the prop blades are paper thin and flare a good deal under moderate torque. The focus on drag reduction results in a very slippery airframe. In combination these features make for a model with a slow climb and amazingly “floaty” cruise and descent.

Construction begins as always with careful wood selection. For this class I prefer the flex characteristics of solid motor sticks, but finding the right one has always been a chore. After cutting and testing several blanks, I settled on a springy piece of 5.4# B-grain. The fuse must be torsionally stiff between the wing posts to keep the top wing from twisting too much. Target weight is around 2g, depending mostly on the overall length. The tail boom is 17 inches long so very light, stiff wood is critical. It must not deflect too much on launch or weigh too much - either condition would make trimming and flying difficult, if not impossible. I found my boom in the same sheet as my fuselage; it's 4.5# and has an SC of around 120. A deflection of 1/2" at 17 inches with a 1g test weight is acceptable. Posts should be made of the hardest balsa you can find. Bass would also work well. The posts are tall and must be as stiff as possible. They are elliptical at the fuse and taper to a circular cross section. Leading edges are made from 8.5# C-grain. Denser than normal wood is used because of the spar's small cross section. Selecting wood for the trailing edges is not as difficult. Stiffness isn't an issue because of their vertical orientation. Ribs are made from 5# A-grain, but anything light enough will do.

The top surface of the leading edge spars is shaped while still on the sheet, a la Cezar Banks. After it is cut free the frame is assembled, and then material is removed on the underside, between the ribs, with a razor blade followed by careful sanding. This takes time, and yes, it leaves your spars totally unmatched in deflection. That's alright though - some interplane struts on the leading edge solve this problem. Trailing edges start out rectangular and are final shaped after assembly. An alternative (and likely better) method has recently been employed - that is, to do all spar shaping before assembling the frame, and match the mating surfaces of the ribs to the spars. The original idea came from Neil Henderson. Tip plates are used for roll stability and to control sideslip. As long as they have enough area, the shape doesn't matter. I make them out of straight pieces because it's faster. They should not extend below the rib. A note about gurney flaps - I started experimenting with them about three years ago. At first, they were simply a 1/4" strip of condenser paper glued to a typical trailing edge along the full length of the wing. On later models, the trailing edge spar has been oriented vertically to perform the same function. The effect they have on the model is definitely positive - the stopwatch has proven this (to me, at least). The effect is to slow the climb and lengthen the cruise, with little effect in the descent. A quarter inch seemed a bit large given the reduced wing size and biplane configuration, so they were reduced to 3/16" for this model. The stab must be kept light to make trimming easier.

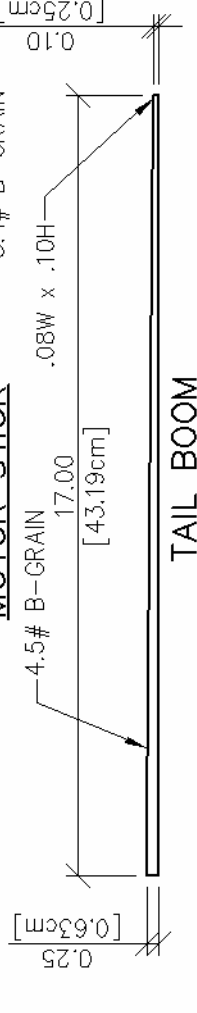


(BOTTOM WING HAS STRONGER SPARS THAN TOP WING)



Technical drawing of a rectangular plate. The drawing shows a rectangle with dimensions and labels. The top edge is labeled $.15W \times .25H$. The bottom edge is labeled $.15W \times .25H$. The left edge is labeled $.20W \times .45H$. The right edge is labeled $.15W \times .25H$. The width of the plate is 18.00 [45.72cm]. The height of the plate is 10.00 [25.41cm]. The drawing also shows a section line with arrows pointing to the top and bottom edges, labeled $.025$ and $[0.63cm]$. The drawing is labeled 0.25 and $[0.63cm]$.

5.4# B-GRAIN



TAIL BOOM

DOUBLE TROUBLE



FUSE	2.15
BOOM	.65
STAB AND POSTS	.80
PROP	1.88
WING POSTS AND INTERPLANE STRUTS	.65
TOP WING	.80
BOTTOM WING	.90
BALLAST	.17
	8.00

6/4/2005
USIC - FIRST PLACE
JOHNSON CITY, TN
.075" 5/99 X 2.0G
9:23

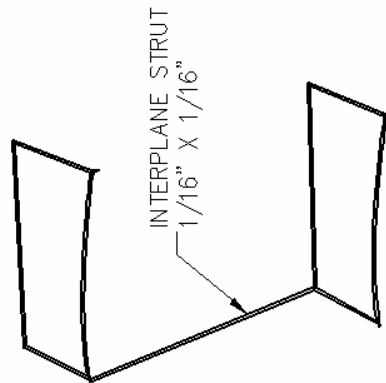
BY CHRIS GOINS
2005 "C" DIVISION MODEL
FOR SCIENCE OLYMPIAD

FIRST PLACE 2005 USC
WITH 2 GRAM MOTOR
TIME = 9:23

FIRST PLACE 2005
POSTAL CONTEST
TIME = 5:41 (25'-6" SITE)

UNLIMITED RUBBER RECORD
LAKEHURST HANGAR 1
7/04/2005
TIME = 10:24

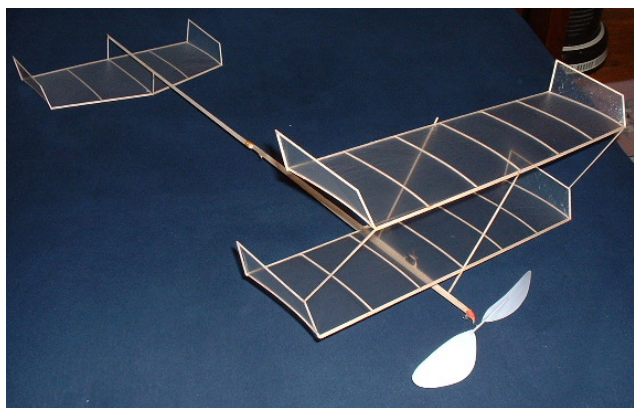
ASSEMBLED VIEW OF TIP PLATES



Modifying the Ikara prop is perhaps the most time consuming part of the build. Starting with one of Harlan's SO props, the blades are reduced in thickness by sanding the underside with 400 grit sandpaper wrapped around a soda can. I hold the blade cupped in my hand, with my fingers controlling where the pressure is applied. You must work slowly to keep the blade from deforming too much. Matching the blades in weight is important, but matching their flare characteristics is essential. The spar is blended into the surrounding blade, and the hub area is lightened. The blade shape is easily changed with a pair of scissors, but it's best to do this after sanding is complete. The pitch is reduced and the distribution is checked. After all that sanding, it will probably be pretty far off. The plastic can be persuaded into the correct shape with your hands if this is the case. I put a bit more camber in the blades and several degrees of washout in the tips, knowing that both would nearly disappear at full flare.

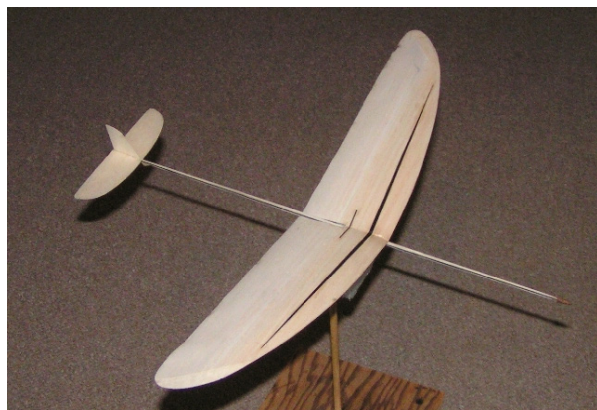
Flying this airplane is a dream. Flying speed is in the Pennyplane range, maybe slower. I expected the biplane to be more difficult to trim, but this proved not to be the case. The first time out of the box, it broke 5 minutes in my local gym. About a week later, I pulled a 5:41 to win Don's postal contest. The plane was rebuilt for USIC with a stronger fuse and bottom wing. I thought the model would be flyable without the interplane struts, but they were definitely needed at high launch torque. I spent the first day chasing the model around the floor as first one wing would tuck, and then the other. For the second day I put the struts back on, and it was back to being a well behaved airplane. After a few partial motor tests, I made my official flights. The first two were on .078" 7/02, with times of 6:30 and 7:30. I switched to 5/99 and dropped the size a few thousandths. The third flight was 8:30, followed by the 9:23, right under the rafters. I broke the motor winding for my final official flight. The plane sat in the box until I went to Lakehurst over the July 4th holiday weekend, and it sat there while I struggled with my F1D's. I have to admit that I didn't do ten minutes there - Steve Richman, Brett Sanborn, and Matt Chalker did, though. I sat and laughed while Matt wound the motor, Steven launched, and Brett steered. Or was it the other way around? Anyway, the last flight of the day was made on 3.3g of .095 7/02, and ended up being a 10:24. Not too bad for an 8g airplane!

Chris Goins Models



Double Trouble

9:23 on 2 gram motor!



Micro-Poker

Cat 1 Open UCLG Record Holder
90.5 sec 2 flight total

Fourth of July, 2005 At Lakehurst, New Jersey

Here is a random rundown of the contest from people who were there.

There were 32 AMA members there over the 4th weekend. I was there two days to help in any way I could. Doug Barber was there with Mary Jane for a short time on Sat. Also there was the new Pres. of the DC Maxicuters Stefan Proskey who had that neat RC camera plane and shot about 14 hrs of video, including the record flight of John Kagan.

- Alan Mkitarian

I sent my camera up on the catwalks of Hangar 1 and it came back with some interesting pics of the hangar from a different perspective. I posted them on Jeff Hood's website at www.indoornews.com.

- Bill Gowen

I don't know the exact event, maybe event 629, but one of the electric indoor rc duration events had a new record set on Saturday. The plane was up for 6 hours! All of us thought the guy (must have been Ray Harlan) was nuts, but still impressive, definitely more of an endurance for the body instead of the airplane. If anyone has some other specific details, they'd be nice to share. I know a few other records were set too, I believe Doug got the helicopter record, there was an F1L record, Int. Stick maybe as well. That's not to say anything about Max's 35:30 in F1D on a fixed pitch prop or Chris Goins (and company) having a 10:30 on unlimited SO. Overall, it was definitely a great weekend. If anyone is thinking of coming out to the hanger, you definitely should, it truly is one of, if not the greatest site on the planet.

- Matt Chalker

For the record, Romash's girlfriend is super cool - she brought us ice cream sandwiches, and even brought and flew a glider that she built. The SO flight was interesting...wound by Matt Chalker, launched by Steve Richman, steered by Brett (or something to that effect)...all while I was sitting back watching and laughing.

- Chris Goins

Ministick

Brett Sanborn	14:02
Rob Romash	13:45
Alan Cohen	13:42
Doug Schaefer	13:13

Pennyplane

Bill Gowen	18:22
CLG Standard	
Rob Romash	150 sec 2 flight

Limited PP (Indoor Cup Event)

Rob Romash	18:12
Max Zaluska	17:04
Steve Richman	15:39
Brett Sanborn	15:30
Richard Li	10:55

Unlimited CLG

Rob Romash	148 sec 2 flight
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Intermediate Stick

Larry Coslick	43:47
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EZB

Larry Coslick	31:34
Allan Cohen	29:02
Doug Sheaffer	28:28

HL Stick

John Kagan	1 Hour 1min 30 sec	Epic
Matt Chalker		Something like 20 sec

F1M

Bill Gowen	19:42
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SCI OLY

Chris Goins	8:30
Dave Drummer	6:07

F1L

Larry Coslick	23:??
Bill Gowen	22:11
Rob Romash	16:42

HLG

Rob Romash	109 sec - 2 flights
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U.S. F1D TEAM SELECTIONS AT MOSCOW, ID, JULY 23-26, 2005



2005 USA F1D Senior Team Selection Finals							
	Contestant	Best	2nd	Total	Finals pts	Rgnl pts	Score
1	Kagan, John	34:14	33:49	68:03	1000.00	100.00	1100.00
2	Calliau, Larry	34:25	33:11	67:36	993.39	100.00	1093.39
3	Sanborn, Brett	33:27	31:46	65:13	958.36	100.00	1058.36
4	Sova, Tom	32:42	31:26	64:08	942.44	100.00	1042.44
5	Brown, Steve	32:06	32:00	64:06	941.95	100.00	1041.95
6	Banks, Cezar	32:21	32:15	64:36	949.30	88.99	1038.29
7	Bennett, Mark	31:51	31:14	63:05	927.01	100.00	1027.01
8	Johnson, Brian	31:06	29:56	61:02	896.89	100.00	996.89

2005 USA F1D Junior Team Selection Finals							
	Contestant	Best	2nd	Total	Finals pts	Rgnl pts	Score
1	Aaron, Ethan	27:01	26:58	53:59	1000.00	100.00	1100.00
2	Ray, Nick	26:58	26:44	53:42	994.75	100.00	1094.75
3	Young, Justin	26:49	26:01	52:50	978.70	100.00	1078.70
4	Kottapalli, Anjaney	24:27	23:34	48:01	889.47	100.00	989.47
5	Chang, Tim	23:51	23:36	47:27	878.97	100.00	978.97

A REQUEST FOR CONTRIBUTIONS

My purpose is two-fold. First and probably most important, I again will serve as the collecting point for monies donated to help defray the costs of sending our THIRD COMPLETE JUNIOR TEAM TO THE WORLD CHAMPIONSHIP. Any money donated will be reserved for that purpose in the aegis of the NFFS, and hence is tax deductible. The mailing Address is Vern Hacker, MD, 25599 Breckenridge Dr., Euclid, Ohio 44117-1807. Phone number 216-486-4990. I will send all donors a card thanking them and confirming a tax deductible donation.

Second item is this: Those team members as well as those of the past two contests have all come from the Wright Stuff ranks of Science Olympiad. I do not have Dr. Putz's address handy. I am sure you can find it on the web site for SO. I would hope that many of you will send him a thank you note for the WS event, and perhaps at the same time express your regrets that it no longer exists at the Middle school level

Thanks
Vernon D. Hacker M.D.

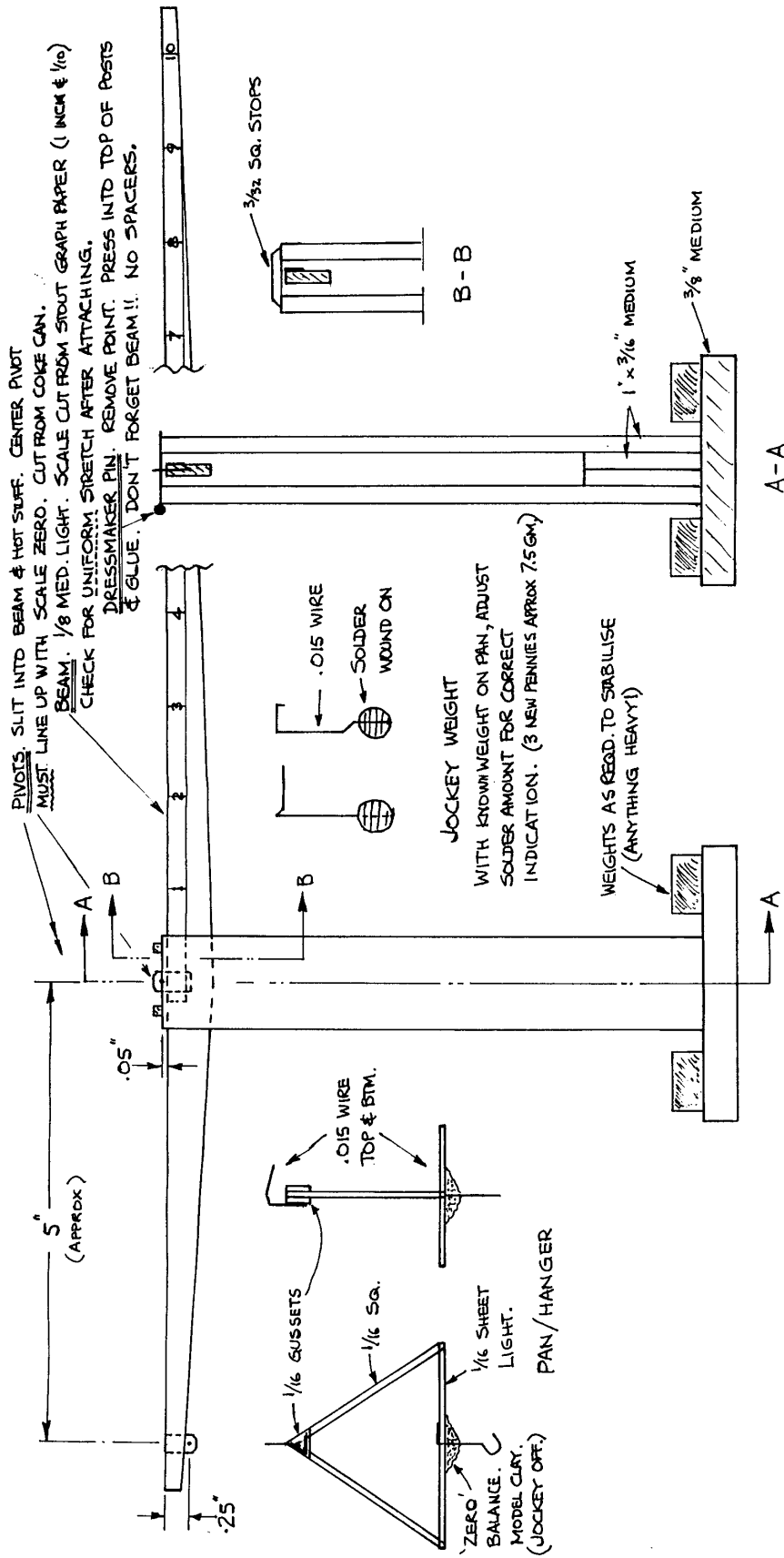
AN ACCURATE 10 GRAM SCALE

by John Barker

Here is an easy-to-build item that falls between the super-simple Harlan spring scale and digital varieties. Here is what John has to say about it:

“Here is the plan together with one for my 10 gram scale. The scale was created out of desperation one evening to avoid having to spend good money on something which had to be treated like a baby. It resides in the bottom of a box used to carry a Bostonian, an Embryo and one or two Dime scale models. One feature not noted on the plan is that the jockey weight should be coated with epoxy before trimming to final exact weight, and it should be put into a small zip-lock bag when not in use.”

It is fairly common knowledge that a new penny is almost exactly 2.50 grams, but also 1/32 music wire is very handy stuff. One inch is 100 milligrams, and 10.1 inches is 1 gram exactly. – Ed.



10 GRAM SCALE

J.BARKER OCT '93

PROPERLY SET UP & CALIBRATED THIS BALANCE IS SENSITIVE TO .02 GRAM.

93.

KIBBIE DOME ANNUAL
MOSCOW, IDAHO JULY 23-26, 2005
by John Lenderman

This competition produced one of the best turnouts we had ever had and also some of the stiffest competitive flying we have experienced in many years. We had a good many of the top flyers in the indoor world present for this event. Many here for the first time said the Dome was probably one of the better places to fly in the world, and that they would be returning when they can.

We were supposed to start at noon on Saturday, but were delayed due to a volley ball tournament. Those arriving on Friday were allowed to store their model boxes and equipment in a side room. Even after the volley ball was over, it took the work crews still longer to prepare the building, but the glider flying began shortly before 8 P.M. and continued until midnight, with some excellent flying in the later evening. The next morning we finally got our tables and chairs, and set up for the competition.

Since the Science Olympiad mass launch was scheduled for Sunday Noon, we saw many good test flights, especially the controversial "offset biplane" models of Doug Schaefer and Brett Sanborn. They were biplanes, with each wing meeting the Science Olympiad rules. However, the wings were connected with struts that were attached to the outer 6 inches of the top wing to the inner 6 inches of the bottom wing, giving a span of approximately 32 inches. CD Andrew Tagliafico questioned the legality of this idea but was finally convinced that it was legal under the SO rules. Each went on to post flights over 7 minutes. Cezar Banks also flew over 7 minutes. Chris Borland, with some test flights over the 7 minute mark, could only post a 6:59 officially. Jessica Bufford, a junior from Vancouver, Washington, posted a great flight of 5:55. She has only been flying a few years, and is mentored by Andrew.

The glider flyers really showed up in great numbers, and the competition was excellent. Mark Benns, from England, flew to a possible world record in hand launched glider. Surprisingly, Mark used a discus throw, just like the RC flyers. I talked to him the first day, and he said he had not flown this glider indoor yet. He used the whole width of the dome on the flights. Mark's times were 84.8 and 83.5, for a total of 168.3 for the possible record. Ken Krempetz is also applying for a senior catapult record, with a combined time of 216.6 seconds. There were unbelievable incidents. Bob DeShields was flying catapult, and put some extra effort into the launch. The ceiling of the dome is wood, and in some places, it has cracks from the heat. When Bob launched, his glider went straight up to the roof and disappeared, going right through one of the cracks! He never saw it again.

"The Battle of Seattle" in HLG was sponsored by Bruce Kimball, and will be reported separately by Bruce. The flying in that event was impressive, with Jim Buxton the winner. Australia's Len Surtees had a Styrofoam glider, with carbon fibre spar and bracing, and did quite well. His glider had a very smooth undersurface, but the top surface was slightly rough, to help the glide. There were a total of 19 competitors in Standard Catapult, with Stan Buddenbohm coming out the winner with a two-flight total of 180.9. Kurt Krempetz was second with the time of 180.3, and third was Lee Hines with a 178.7 time. Close times! Unlimited Catapult showed Kurt on top with an outstanding 216.6, and Stan second with a 189.4, and Hines again was third with a 186.4.

Limited Pennyplane showed again how close the times were--John Lenderman, flying his Thrush, was first with a 14:58, with Tom Sova, putting up a great flight of 14:56, followed by quiet Jim Richmond with 14:54. Mini-stick had some great flying with Robert Romash posting a site record time of 13:40 to win. This was not even his best model, which he had lost the day before to a ceiling tile. Rob gets in an incredible number of turns into his motors. And what a craftsman! His display of models made from foam was amazing. He showed a model of an Indy racer that he had to pick up with a pair of tweezers. Second in Mini-stick was Gary Hodson with a great 13:07, and third was Emil Schutzel with a 12:29. It took Bob Bailey, from England, to show us how to fly F1L EZB. He bested everyone with two outstanding flights of 21:11 and 21:20. In second was the originator of the EZB event, Wally Miller, with a total of 40:63. He builds some really neat models. In third was Mike Palrang, with consistent flights in the nineteen minute range, a 39:20 total time. The F1D event had a good number of entries, and our current World Champ came through with some great flying, and posting a two flight total of 64:56. Sometimes you hardly know Jim is there until you see his high scores posted. In second place was genial

Bob Bailey with a total of 62:54, and third was Fred Tellier with a good 62:06. In the A-6 event Tom Sova put up a 10:06 early on, and no one could catch him. Gary Hodson tried mightily, but fell short with a 9:43, and John Lendermen trailed Gary with a decent 9:04. EZB saw some great flying by Jim Richmond, who posted a 27:08 time to win the event. Doug Schaefer, the current F1D Junior champ flew his model to a nice time of 26:13, while John Lenderman put up a 24:04 for third place.

The Pennyplane winner, Jim Richmond, had a really good flying model to win with an 18:48 time. In second, getting back after an absence, was Bob DeShields, flying a nice model with an 18:20 time. Intermediate stick winner was Bill Leppard, with a great 27:32 flight, with Wally Miller second with a new model at 26:43. Third was Fred Tellier with a time of 26:16.

We all extend our thanks to Andrew Tagliafico for organizing a great time to meet and fly with our friends!

STD. CAT. GLIDER (19)

- | | |
|--------------------|-------|
| 1. Stan Buddenbohm | 180.9 |
| 2. Kurt Krempz | 180.3 |
| 3. Lee Himes | 178.7 |

UNLIM. CAT. GLIDER (12)

- | | |
|--------------------|-------|
| 1. Kurt Krempetz | 216.6 |
| 2. Stan Buddenbohm | 189.4 |
| 3. Lee Hines | 186.4 |

LIMITED PP (16)

- | | |
|-------------------|-------|
| 1. John Lenderman | 14:58 |
| 2. Tom Sova | 14:56 |
| 3. Jim Richmond | 14:54 |

MINI-STICK (11)

- | | |
|-------------------|--------|
| 1. Robert Romash | 13:40+ |
| 2. Gary Hodson | 13:07 |
| 3. Emil Schutzzel | 12:29 |

F1L (11)

- | | |
|-----------------|-------|
| 1. Bob Bailey | 42:31 |
| 2. Wally Miller | 40:63 |
| 3. Mike Palrang | 39:20 |

F1D (9)

- | | |
|-----------------|-------|
| 1. Jim Richmond | 54:56 |
| 2. Bob Bailey | 62:54 |
| 3. Fred Tellier | 62:06 |

A-6 (8)

- | | |
|-------------------|-------|
| 1. Tom Sova | 10:06 |
| 2. Gary Hodson | 9:43 |
| 3. John Lenderman | 9:04 |

EZB (7)

- | | |
|-------------------|-------|
| 1. Jim Richmond | 27:08 |
| 2. Doug Schaefer | 26:13 |
| 3. John Lenderman | 24:04 |

S. OLYMPIAD OPEN (7)

- | | |
|------------------|------|
| 1. Brett Sanborn | 7:22 |
| 2. Cezar Banks | 7:18 |
| 3. Chris Borland | 6:59 |

PENNYPLANE (6)

- | | |
|-------------------|-------|
| 1. Jim Richmond | 18:48 |
| 2. Bob DeShields | 18:20 |
| 3. John Lenderman | 15:32 |

INTERMEDIATE STICK (4)

- | | |
|-----------------|-------|
| 1. Bill Leppard | 27:42 |
| 2. Wally Miller | 26:43 |
| 3. Fred Tellier | 26:16 |

F1M (3)

- | | |
|-----------------|-------|
| 1. Fred Tellier | 19:50 |
| 2. Bill Leppard | 17:56 |
| 3. Steve Smith | 15:25 |

S. OLYMPIAD JR/SR (3)

- | | |
|--------------------|------|
| 1. Doug Schaefer | 7:25 |
| 2. Jessica Bufford | 5:55 |
| 3. Rebekah Altig | 5:07 |

ROG STICK (3)

- | | |
|------------------|-------|
| 1. Wally Miller | 18:13 |
| 2. Ed Berray | 16:53 |
| 3. Bob DeShields | 13:10 |

BOSTONIAN (2)

- | | |
|-------------------|------|
| 1. Emil Schutzzel | 5:27 |
| 2. Lou Young | 3:21 |

35 CENTIMETER (2)

- | | |
|---------------|-------|
| 1. Bob Bailey | 32:17 |
| 2. Rob Romash | 21:03 |

HAND LAUNCHED STICK (2)

- | | |
|-----------------|-------|
| 1. Jim Richmond | 29:03 |
| 2. Herb Robbins | 21:07 |

HELICOPTER (2)

- | | |
|------------------|------|
| 1. Jim Richmond | 9:06 |
| 2. Doug Schaefer | 9:00 |

MANHATTAN (1)

- | | |
|--------------|------|
| 1. Dave Saks | 8:00 |
|--------------|------|

ORNITHOPTER (1)

- | | |
|-----------------|------|
| 1. Herb Robbins | 5:35 |
|-----------------|------|

SCIENCE OLYMPIAD MASS LAUNCH (5)

- | | |
|----------------------|------|
| 1. Chris Borland | 6:32 |
| 2. Doug Schaefer | 6:31 |
| 3. Andrew Tagliafico | 6:17 |

SCIENCE OLYMPIAD TEAM CHALLENGE (3)

- | | |
|------------------------------------|-------|
| 1. Doug Schaefer – Brett Sanborn | 14:41 |
| 2. Chris Borland – Cezar Banks | 14:17 |
| 3. Jessica Bufford – Rebekah Altig | 13:27 |

+ New Site Record

Note: Catapult events, F1L and F1D times are the total of two best flights.

2005 KIBBIE DOME ANNUAL, MOSCOW, IDAHO



UK's Mark Benns wowed with Discus Launched Gliders



Rodney O'Neill and Roberta from Belfast, Northern Ireland



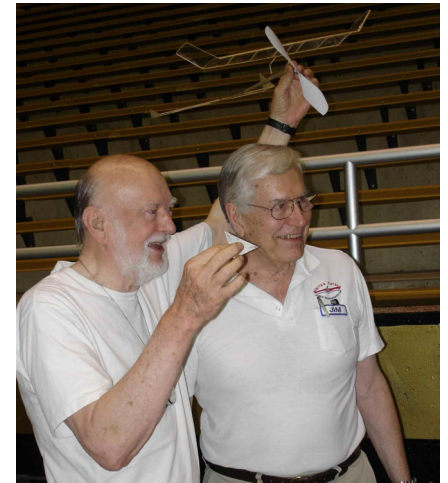
England's Bob Bailey Dominated F1L, 35 Cm, Snagged 2nd in F1D



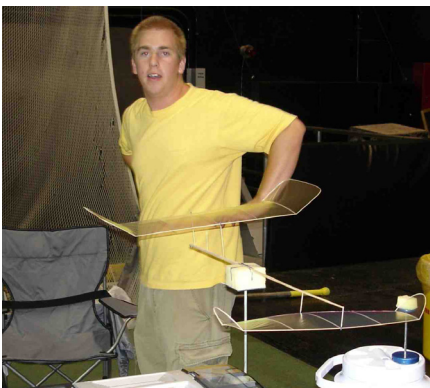
CD for All Seasons, Andrew Tagliafico with Baby Blue AROG



Ray Harlan Coached Ethan Aaron to Tops in Junior F1D



Cezar Banks with Jim Richmond



Nick Ray Made Second Place Junior in F1D Trials



Orv and Marcy Olm of Gizmo Geezer, from Saskatoon, Canada



Wally Miller & John Lenderman with Stearable String Cutter

2005 KIBBIE DOME ANNUAL, MOSCOW, IDAHO – PART II



Kurt and Balloon Launch Gliders
May Be a New Event to Watch



Jim Lewis from Macon, Georgia,
He Won Hand Launch Glider



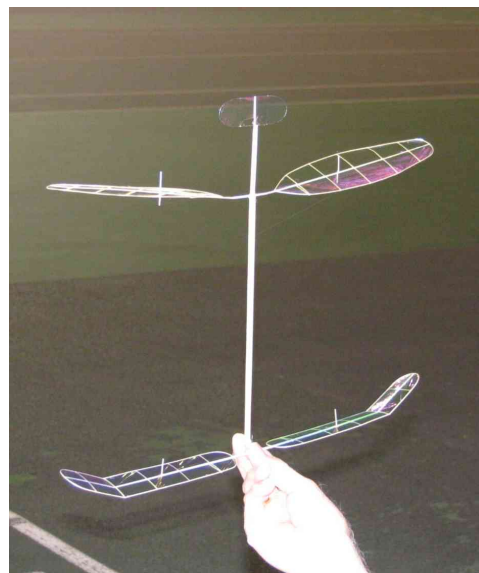
Bob DeShields Now Lives in Idaho,
Flies Indoor and Outdoor FF.



John Kagan Dominated F1D Trials,
Fresh from His 1 Hr. Lakehurst Flt.



Mark Bennett With the Latest
Fashion in Steering Headgear.



Jim Richmond Won Helicopter with this
Nine Minute Job



Dave Haight's Bombers Flew Well
FAC Had Good Showing



Editor Carl with Wife Sharon, Tent
Camped Lewis & Clark Trail Too



Bill Leppard with Wayne Johnson of
Geauga Fame

THE DORCOL CUP FOR F1D

Belgrade

August 28, 2005

Bob Bailey, Clive King, Geoffrey Lefever and I flew out of Heathrow for this event after seeing it advertised on the FAI website and with shots of the hall on the 'Modelar' site as well.

Our main contact beforehand was Voja Stojkovic, aided by Slobodan Midic, and both greeted us at the airport together with several other fliers, officials, a charming translator and friends. We had graciously been allowed extra practice time for two days before the contest and much had been done to make us feel welcome. After hiring a car, we headed to our hotel in convoy and settled in.

The flying site is a 22 meter barrel vaulted exhibition hall at the Belgrade fair complex near the middle of the city. The ceiling is scrubbable although the moving air near the roof makes this inadvisable. For the next 2 days, we trimmed and tested before the rather hectic schedule of a 6 round contest on the third day. The air was good during practice and Bob Bailey flew a 30 + test flight, upping the hall record by several minutes.

In a break during practice, we were given a guided tour of a much bigger hall a few hundred yards away, which is the proposed site for the 2007 European Champs, and is also a serious possibility for a future World Champs. Excellent relations between Voja Stojkovic and the Director of the Trade fair site have made all these facilities available.

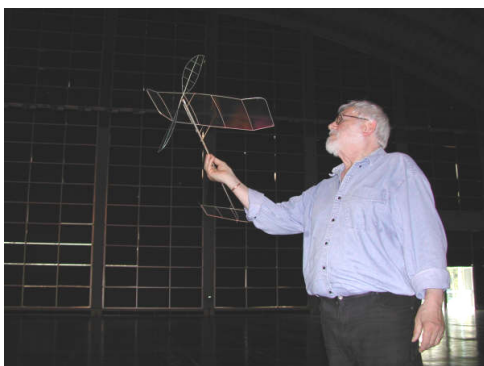
We were surprised by the small entry – only ten seniors and 3 juniors. The hall is a very good site and the annual contest deserves better support. Next year it is likely that the 6 contest rounds will be spread over 2 days rather than one and this will make things easier to manage. On the day, the air was buoyant, although again, turbulence near the ceiling limited the safe usable height to round 60 feet. Luckily, a supply of balloon gas had been secured and Bob Bailey's Mylar balloon and steering expertise were often needed by others.

VP props were essential for long flights and Bob demonstrated his fine tuning ability by matching his 30 + practice with 30:25 and a back-up of 29:52 to win by a wide margin. The contest ended with a short closing ceremony and the distribution of certificates and hand-made ceramic trophies.

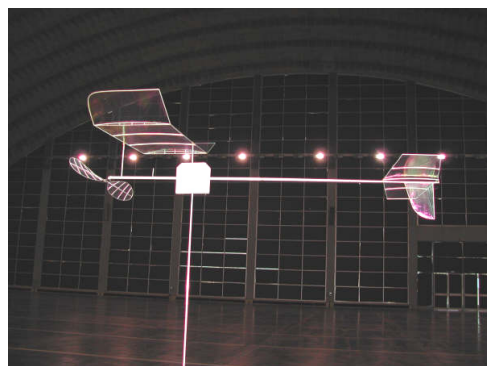
The next day, we had a chance to explore a small part of the city centre which looks lively and modern, and then spent a pleasant afternoon with our hosts, discussing various aspects of indoor and Champs preparation while sitting in a pretty park, overlooking a splendid panoramic vista of Belgrade and the Danube and Sava rivers.

On behalf of the 'Britpack', I thank Voja and all our hosts for their enthusiasm and welcome. For me, the experience was very hard work, but also highly enjoyable and we all returned home with new friendships that will continue to prosper.

Nick Aikman.04.09.05.



Geoffrey Lefever Launches



Slobodan Midic's F1D

Modifications to 1/4" Backer Rod for Steering

By Derek Richards

Over the years that I have been flying Indoor and particularly F1D, I have tried to find a usable and satisfactory material for the last 25'-35' of the balloon steering line. Some substances proved to be too thin and therefore they got entangled in the V.P. prop mechanism or became invisible when you needed to see them. Some materials I tried, like 3/8 diameter foam caulking which was otherwise OK, oscillated from side to side while the model was on the line and this caused the model to fall off and get left behind when I was walking or concentrating on where I was going.

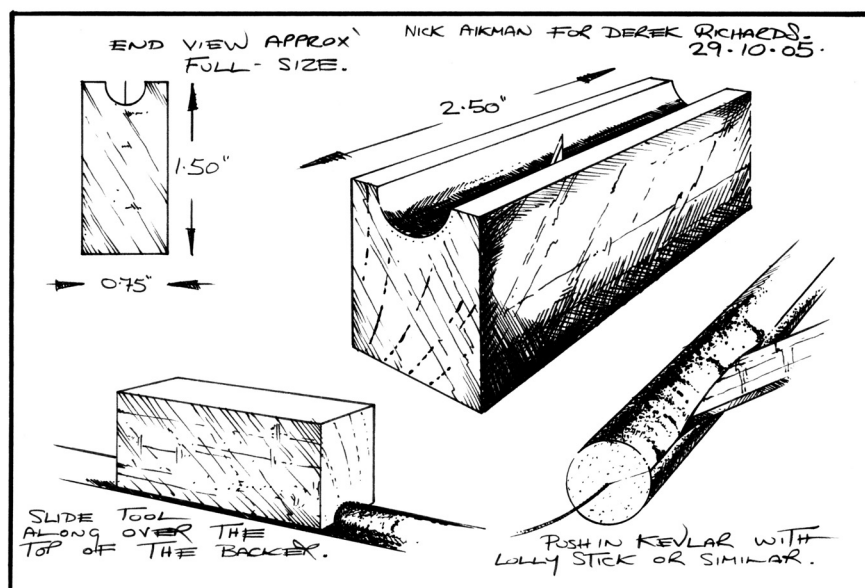
I reasoned that maybe the 1/4" diameter backer would be better. But then I remembered seeing Steve Brown standing down in the saltmine with a reel and a short length of this backer material, wryly looking up at his balloon that was nestled snugly on the roof. The tensile strength of the backer had been exceeded – exit one balloon – vertically! The last thing I wanted to do was lose balloons this way. Thinking about the problem and decided that I needed a safety line in addition to the backer.

I chose to use 40lb-breaking strain Dacron and I made a simple tool consisting of a block of balsa with a semicircular groove down its length, the width of this groove was the diameter of the backer. I inserted a scalpel blade into the tool so that it protruded into the groove with the blade tip being level with the surface of the block. Sliding the tool down the length of the backer thus gave a radial cut.

To apply the Dacron I opened up the cut at one end and slid the line into it, then using an ice cream stick I pushed the line into the whole length of the slot. I followed this up with some Deluxe Materials super aliphatic glue to seal the slot back up.

Next morning, having left it to dry, I had what looked like a very long candle with the wick hanging out each end. All I had left to do was make the ends of the line to suit my balloon rig fittings. The tension loads from the balloon are now catered for by the Dacron, and the steering by the backer. At the time of writing, I haven't tested this contraption but I can't imagine any mechanical problems. I will report when the rig is used in anger.....

(Nick Aikman, Bob Bailey and I used the 'virgin' rig in the recent Euro Champs. Although the extra volume over a ribbon may make it slightly more difficult to position, we felt it worked extremely well and none of us missed a steer all week).



THE F1D EUROPEAN CHAMPIONSHIPS
BORDEAUX. OCTOBER 2005.
(CLASSIC DRAMA AND FRENCH FARCE)

The lineage of European F1D Championships was re-established in the Millennium Dome in London in 2003, and this has been continued with a very successful contest at the National Velodrome near Bordeaux in southern France.

The Championships were undoubtedly a great success for GB as we placed first in the Team event. This is the first time that a GB Team has won gold in a major international F1D event since 1978.

Many things about the Championships were excellent. Accommodation, food and the friendly spirit, discussion and atmosphere among competitors were all superb. The hall itself is a 30 metre high structure constructed from large wooden, composite beams, which are topped by a shallow square pyramid. Mercifully, although the site is fairly small, there were relatively few mid-air collisions. There was drift throughout the event, but the air generally settled down in the afternoons and some spectacular times were flown in a relatively low ceiling.

Much about the contest organization was farcical:

1. The one practice day was abruptly curtailed without warning, just as the air settled and was getting good. This was due to an unscheduled half-hour Max Sennett style chase through France to visit the local mayor.
2. There was no recognizable opening ceremony.
3. The Team Managers meeting was a shambles. None of the Jury members or CD were introduced and it became apparent that there were only a dozen or less timekeepers. Because of this, it was explained that a queuing system would be imposed, and that it would be the Team Managers' responsibility to ensure that all flights (including re-flights) would take place within each round. When TM's attempted to point out that this would be physically impossible, they were ignored. Most of the discussion took place in French and was therefore totally meaningless to many.
4. There was no timekeepers briefing.
5. The original weighing scales for rubber were only accurate to 50 milligram increments. Therefore, in theory, competitors could have flown on well over 0.60 grams of rubber.
6. There were no announcements about the opening and closing of contest rounds until the final day when an air-horn finally appeared
7. The jury made different decisions about when re-flights could be made on different days.
8. Processing of models and rubber was virtually at the whim of the competitor. There was no adequate system to ensure parity of processing. I and other GB fliers had to ask for motors to be weighed and models to be checked.
9. The whole GB Team assumed that one person was the CD, only to find (when the final printed results were issued), that it was someone else entirely, who had never made his presence known.
10. There were no individual medals presented, so all that we went home with to mark success was an FAI certificate.

The overall impression was that the organizers couldn't and didn't! This is strange as a very successful national contest takes place in Bordeaux every year.

Despite these and other failings, the contest ran remarkably smoothly overall. More timekeepers were press-ganged into service, (including the inappropriate use of Team helpers and Team Managers) and flyers from 12 nations made this a truly international event. There were 9 full Senior and 3 full Junior teams, making a total of 39 competitors. Sadly the Ukrainians were unable to obtain visas and there were no Serbian or Swiss entries.

Beforehand, we had identified the Hungarian, Romanian and German Teams as the main opposition, and so it proved to be. Although my own performance was average at best, together GB managed to stay ahead through all 6 rounds. In round 6, the air was not quite as stable as on previous afternoons and at a time when big flights can often change things considerably, fliers from elsewhere couldn't add enough to their Team totals to catch us. At the end of the event, just over 3 minutes separated the top 3 Teams. It was nail-biting stuff right to the end.

The individual contest was also dramatic with Dezso Orsovai making his 2 best flights in the afternoon sessions - in rounds 2 and 4. His best time of 35:55 was excellent for such a low ceiling and was achieved in the best air all week. Ivan Treger in 3rd (and apparently in his first contest!) also made his best flights in these rounds. 2nd placed Jonas Romblad made his top time in the last round with the help of some expert steering. Although I wouldn't call this a steering contest, ability with a balloon and line undoubtedly had a part in the final outcomes, and Orsovai, Romblad and the Brits excelled at this.

All the top fliers made use of well tuned VP props and the consensus seemed to be that a slow pitch change was of more benefit than a hub that changed pitch quickly. There was little in the way of new ideas or gadgets, although Lutz Schramm continued his wide prop blade development with one prop having a balsa leading edge and a boron trailing edge and another prop with an outline made from moulded Kevlar filament. The sensible use of a 'blast plate' is slowly gaining ground, now that motors are wound so hard.

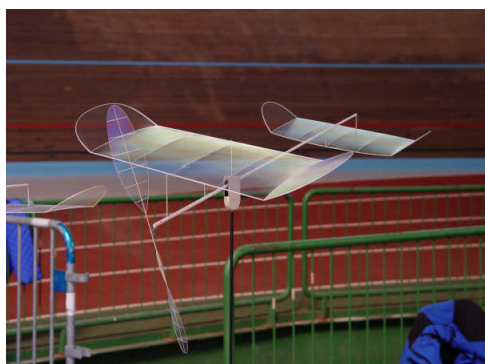
Nick Aikman.24.10.05.



Andras Ree Repairing



Aurel Popa and Bob Bailey



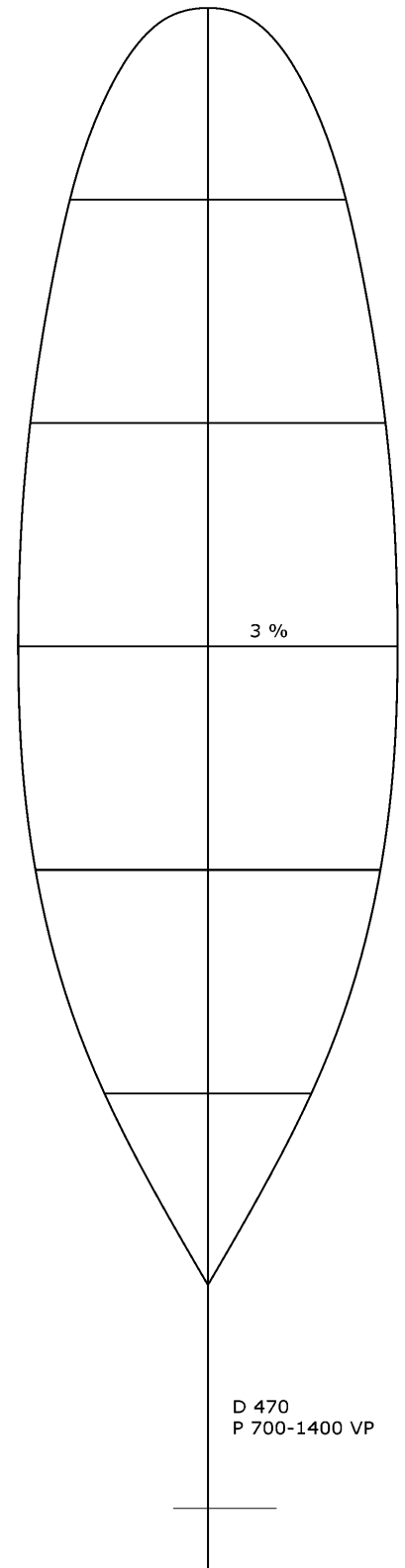
Dezso Orsovai F1D
(plan on pp. 36 and 37)



Jonas Romblad Perfect 10 Launch

M 91 data

parts	sizes, mm (boron & tungsten, in.)	density kg/m ³	weight mg
wing			
spars	1.41x0.92<1.8x0.92 (2x boron .003)	77	106
tips	1.3x0.9 > 0.9x0.6	85	54
middle ribs	1.2x0.62 4% ellipse	68	78
comp.ribs	1.3x0.63	81	
posts	1.47x1.32x90 (3x boron .003)	85	50
tubes	Ø1.7x8 jap. tissue		8
covering	Y2K2		
stick			
sheet	305x20x0.32 Ø6.5 (3x boron .004)	65	128
bracing post	1.24x0.95 > 1.0x1.0x30	86	5
bracing wire	.001 tungsten		
bearing	alu 0.55x1.2x14 orsi typ		18
rear hook	Ø0.31 music wire		18
front boom	240x18>15.3x0.25 (2x boron .003)	64	80
stab			
spars	1.3x0.82 > 0.93x0.6	77	64
ribs	1.0x0.5 2,5% ellipse	80	29
tubes	Ø1.5x5 jap. tissue		6
covering	Y2K2		
rear boom			
sheet	200x16.8>12x0.21 (2x boron .003)	64	39
posts	1.25x1.4x40 (2x boron .003)	85	17
prop			
outline	0.7x0.6 > 0.7x0.4	83	37
ribs	0,6x0,5 3% ellipse	77	16
spar	Ø1.7 > Ø0.5	90	78
covering	Y2K2		
shaft	Ø0.35 music wire		
VP	Banks style, spring Ø0.2, 3.5 turns		108



THE FORTY MINUTE CLUB

NAME	COUNTRY	TIME	OPEN*	65CM	55CM	YEAR	SITE
BROWN, STEVE	USA	63:54	X			1996	SANTA ANA
KAGAN, JOHN	USA	61:30	X			2005	LAKEHURST
RICHMOND, JIM	USA	59:01	X			2002	AKRON
RANDOLPH, BOB	USA	55:06	X			1993	SANTA ANA
BROWN, STEVE	USA	53:45		X		1997	SANTA ANA
ASLETT, BERNARD	UK	52:22	X			1983	CARDINGTON
COSLICK, LARRY	USA	52:04		X		1999	AKRON
UNDERWOOD, GARY	USA	51:58		X		1996	LAKEHURST
GIBBS, BOB	USA	51:53	X			1999	SANTA ANA
ROBBINS, HERB	USA	51:36	X			1998	SANTA ANA
KAGAN, JOHN	USA	51:11		X		1999	AKRON
DOIG, RICK	USA	50:41		X		1995	AKRON
KOWALSKI, DICK	USA	50:41	X			1976	AKRON
RICHMOND, JIM	USA	50:12		X		1999	AKRON
BANKS, CEZAR	USA	49:50		X		1996	MOSCOW, ID
ROMAK, BUD	USA	49:35		X		1991	LAKEHURST
RANDOLPH, BOB	USA	49:31		X		1995	AKRON
BARR, LAURIE	UK	49:29		X		1996	CARDINGTON
HUNT, BERNARD	UK	49:07		X		1997	CARDINGTON
SLUSARCZYK, DON	USA	48:10		X		1995	AKRON
BUTTY, RENE	SUI	48:01		X		1996	MOSCOW, ID
ROHRBAUGH, AL	USA	47:40	X			1997	AKRON
TIPPER, JOHN	UK	47:21		X		2000	SLANIC PRAHOVA
HARLAN, RAY	USA	47:13		X		1980	AKRON
GIBBS, BOB	USA	47:03		X		1998	SANTA ANA
DOIG, RICK	USA	46:24	X			1983	AKRON
OTA, KENICHI	JPN	46:16	X			1996	MATUMOTO CITY
LOUCKA, LARRY	USA	46:14		X		1995	AKRON
CHILTON, STAN	USA	46:10		X		1994	AKRON
McGILLIVRAY, JACK	CAN	45:57		X		1996	MOSCOW, ID
RODEMSKY, ERV	USA	45:50	X			1974	SANTA ANA
RIEKE, K.H.	GER	45:40	X			1962	CARDINGTON
MERKT, THOMAS	GER	45:27		X		1996	MOSCOW, ID
REDLIN, CARL	USA	45:17	X			1962	CARDINGTON
REE, ANDRAS	HUN	45:13		X		1998	SLANIC PRAHOVA
ANDREWS, PETE	USA	44:59		X		1979	AKRON
ENOMOTO, HIDEO	JPN	44:55		X		1998	MATUMOTO CITY
MATHER, CLARENCE	USA	44:44	X			1974	SANTA ANA
ASLETT, BERNARD	UK	44:37		X		1985	CARDINGTON
DE BATTY, BOB	USA	44:35		X		1996	SANTA ANA
NICOARA, VASILE	ROM	44:30		X		1996	MOSCOW, ID
HULBERT, BILL	USA	44:27		X		1994	AKRON
HACKLINGER, MAX	GER	44:20	X			1961	CARDINGTON
ANDRE, THEDO	NED	44:01		X		1986	CARDINGTON
NORE, PENTTI	FIN	44:01		X		1986	CARDINGTON
ORSOVAI, DEZSO	HUN	44:01		X		2000	SLANIC PRAHOVA
KOPECKY, ERNIE	USA	43:42	X			1963	SANTA ANA
ROBBINS, HERB	USA	43:39		X		1995	SANTA ANA
ALLEN, PAUL	USA	43:36	X			1974	SANTA ANA

NAME	COUNTRY	TIME	OPEN*	65CM	55CM	YEAR	SITE
KUJAWA, SYLWESTER	POL	43:35		X		1992	WROCLAW
AMORARITEI, DAN	ROM	43:31		X		2000	SLANIC PRAHOVA
MANGALEA, CORNELIU	ROM	43:30		X		1996	MOSCOW, ID
CUMMINGS, FRANK	USA	43:28	X			1963	SANTA ANA
ATWOOD, BILL	USA	43:17	X			1963	SANTA ANA
THOMAS, MIKE	CAN	43:01		X		1996	MOSCOW, ID
PLOTZKE, RON	USA	42:53	X			1969	LAKEHURST
FOSTER, JOE	USA	42:44		X		1987	SANTA ANA
SIEBENMANN, DIETER	SUI	42:33		X		1986	CARDINGTON
KELLER, PETER	SUI	42:30		X		1999	BORDEAUX
CALLIAU, LARRY	USA	42:29		X		1985	AKRON
BAILEY, BOB	UK	42:28		X		1998	SLANIC PRAHOVA
DOMINA, DAN	USA	42:25		X		1979	AKRON
CANNIZZO, SAL	USA	42:20		X		1983	LAKEHURST
KRAUSE, MARIAN	GER	42:10			X	2003	CARGOLIFTER
PYMM, DAVE	UK	42:03		X		1986	CARDINGTON
ROMAK, BUD	USA	42:01	X			1965	MOFFETT NAS
LEONARD, NICK SR	USA	41:50		X		1999	AKRON
POPA, AUREL	ROM	41:42			X	2003	CARGOLIFTER
OBARSKI, DICK	USA	41:30		X		1981	AKRON
FINCH, TOM	USA	41:27	X			1963	SANTA ANA
KINOSHITA, SATOSHI	JPN	41:24		X		1993	TACHIKAWA CITY
RODEMSKY, ERV	USA	41:23		X		1979	AKRON
CHAMPINE, BOB	USA	41:23	X			1963	SANTA ANA
STOLL, ED	USA	41:21	X			1963	SANTA ANA
HOFFMAN, EARL	USA	41:13		X		1987	SANTA ANA
BAKOS, FERENC	HUN	41:10		X		1999	DEBRECEN
KIHARA, KAZUMASA	JPN	41:06		X		1998	MATUMOTO CITY
SCHRAMM, LUTZ	GER	41:02			X	2002	CARGOLIFTER
ROMBLAD, JONAS	SWE	41:02		X		1999	LAKEHURST
RICHARDS, DEREK	UK	41:02		X		2000	SLANIC PRAHOVA
MATHER, CLARENCE	USA	40:54		X		1974	SANTA ANA
GANSER, RON	USA	40:53	X			1996	AKRON
DRAPER, RON	UK	40:44	X			1962	CARDINGTON
POPA, AUREL	ROM	40:42		X		1996	MOSCOW, ID
MANGALEA, CORNELIU	ROM	40:38			X	2002	CARGOLIFTER
BILGRI, JOE	USA	40:37	X			1965	SANTA ANA
NONAKA, SIGEYOSI	JPN	40:36		X		1978	CARDINGTON
STEVENS, DARRYL	USA	40:35		X		1986	SANTA ANA
SHEPHERD, JESSE	USA	40:33		X		1995	AKRON
DIHM, JAN	POL	40:21		X		1997	SLANIC PRAHOVA
LOTZ, RAINER	GER	40:20		X		1996	MOSCOW, ID
MOSKALEV, VASILII	UKR	40:15		X		1996	MOSCOW, ID
GITLOW, LEW	USA	40:15		X		1987	SANTA ANA
RODENBURG, OTTO	NED	40:11		X		1986	CARDINGTON
KALINA, JIRI	CZE	40:11		X		1975	CARDINGTON
TRIOLO, JOHN	USA	40:06	X			1974	LAKEHURST
MZIK, LARRY	USA	40:01		X		1995	AKRON
* OPEN – OVER 65 CM		WINGSPAN					

