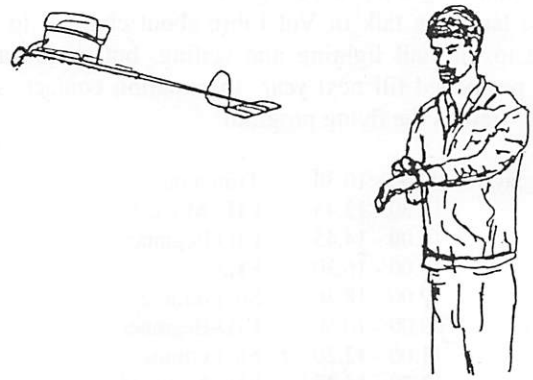
Indoor News



Issue 36 February 1995

DIARY

Jan-Mar '96	**International Mini-Stick Postal Contest,** For details see last issue, Larry Coslick, 4202 Valley Crest Hills Drive, St. Louis, Missouri 63128, U.S.A.
29 May - 2 June Johnson City USA	**U.S. Indoor Championships,** Abram van Dover, 112 Tillerson Drive, Newport News VA 23602, USA, T +1 804 877 2830
15-16 June Orleans France	**14th International Competition of Orleans,** F1D, J. Delcroix, 41 Allée du Coudray, 45160 Olivet, France, T +33 3863 4957
29-30 June Angers France	**International Criterium of Sevres Anjou,** F1D, J-L. Bodin, 2 rue Moulin du Pain, 49000 Sainte Gemmes sur Loire, France, T +33 4147 1697
1-4 Aug Moscow Idaho USA	**Kibbie Dome Annual + 2nd EZB International,** Andy Tagliafico, 10039 S.W. Quail Post Road, Portland, OR 97129, USA, T +1 503 452 0546.
5-9 Aug Moscow Idaho USA	**Indoor World Championships 1996,** Kibbie Dome, AMA, 5151 East Memorial Drive, Muncie, Indiana 47302, USA, T +1 317 287 1256, F +1 317 289 4248
~11 Aug Tillamook Oregon USA	**3-day Fly-in,** Andy Tagliafico, address see above
22-25 August Liège Belgium	**19th International Indoor,** All classes, see elsewhere in this issue. Contact: Bernard Delhalle, 62, Rue de Souvret, B 4200 Sclessin-Liège, Belgium, T +32 41 310792

1996 Indoor World Championships

Information from Free Flight News and Indoor News And Views: The 1996 Indoor World Championships has been confirmed at the Kibbe Dome in USA from August 5th to 9th. This replaces the previous plan for Brno which was withdrawn by the Czech Republic. The site is at Moscow, Idaho, which is situated 350 miles from Seattle. The site has a ceiling rising to 45m high in a span of 122m. Clear floor space inside the seating area for 18000 people is 73m by 128m. There is reported to be very little drift in the building. Competition flying days are August 6th to 8th, with two flights on each day. Entry fee is given as $450 including entry, accommodation and meals.

Preceding the World Championships are the Kibbie Dome Annual to be held on August 1,2 & 3, 1996 and the 2nd International EZB Contest on August 4, 1996. The 4th is reserved for EZB and AMA rules will apply for EZB models only. The Dome hours for the Annual will be from 8:00 am to 8:00 pm. Catapult and Hand Launch Glider fliers will have the floors from 8:00 am to 9:30 am each day.

Immediately after the World Championships, Andrew Tagliafico invites everyone to travel to Tillamook, OR for a 3-day fly-in. Contacts: see diary.

19th International Indoor Belgium

This year there will again be an International Indoor Contest in Liège, Belgium. The contest will take place from 22-25 August 1996 in the "Country Hall", Domaine du Bois St. Jean, Allée du Bol d'Air, B 4031 Angleur-LIEGE.

All categories are accepted and proxy flying for Pistachio models will be allowed. A new addition is a

COLOPHON

Indoor News is published at least four times a year and covers all types of indoor models, from peanuts to microfilm. Texts can be sent in Dutch, English, German and French). Please type your texts on 12,5 cm width. Texts can be sent on floppy disk (3½ or 5¼) in any text format. I can make drawings, if you are no draftsman.

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Fun Fly Contest for "Extravagant" models. Please note: there will be new rules for Sainte Formule. The minimum weight has to be 3 grams.
There has been talk in Vol Libre about changes to be made to the hall lighting and ceiling, but these have been postponed till next year. Information contact: see Diary. Here is the flying program:

Thursday:	09.00 - 10.30	Trimming
	10.30 - 12.45	F1L, Micro 35
	13.00 - 14.45	F1D Beginner
	15.00 - 16.30	F1D
	17.00 - 18.30	Ste Formule
Friday:	09.00 - 10.50	F1D-Beginner
	11.00 - 12.20	Ste Formule
	12.30 - 14.45	F1L, Micro 35
	15.00 - 16.15	F1D Beginner
	16.30 - 18.30	F1D
Saturday:	09.00 - 10.50	Ste Formule
	11.00 - 12.30	F1D
	13.00 - 16.20	F4F, Pistachio
	16.30 - 18.00	F1L, Micro 35
Sunday:	09.00 - 10.00	Trimming
	10.00 - 18.00	F4E, F4D, F4F, Pistachio
	18.00 - 19.00	Fun Fly
	19.00	Results

Constructing small CO_2-motors

by Rainer Gaggl (AUT)

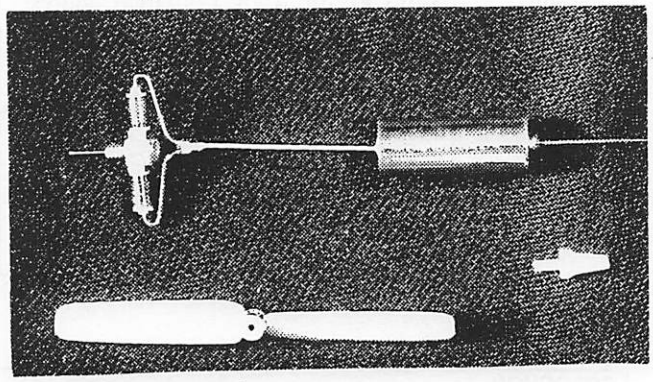
It is a little bit difficult for me to write about the making of my 0.12 mm^3 motor as there exist no construction drawings to illustrate the text. All my motors were made without making drawings. As a CO_2-motor is not that complicated, all considerations on sizes of parts can be made during building.

In fact, the biggest problem on the 0.12 mm^3 motor was obtaining a sufficiently small steel ball for the cylinder head valve. For the 0.79 mm^3 motor I was able to use balls from an automatic wrist watch rotor bearing. But luckily after some months of searching I found a Swiss company who sent me a couple of these tiny 0.3mm diameter balls free of charge (after I had sent them some description and photo's of CO_2-motors).

Building the parts of the motor was not that difficult except that its parts are small and the risk of loosing them is quite high - usually I was faster rebuilding a part than searching for one that had fallen down onto the floor. All building took place on a small table lathe with milling option that was not exceptionally accurate, most important was a digital caliper for measuring with an accuracy of 1/100 mm and some "feeling in the fingertips" for e.g. getting the right fit of the crankshaft in its bearing.

Now some details on construction. The cylinder is made from steel, the thread for screwing it into the crankcase is M1. Most important for a functioning motor is a very good and moving seal of the piston in the cylinder. Therefore one needs a very smooth cylinder bore and this was made in the following way: first all outer dimensions were made ("cooling" fins, thread, exhaust hole), then the cylinder bore was drilled with a 0.45 mm drill. Next step for smoothing was "reaming" the bore with a hard 0.5 injection pin. An injection pin works quite well in not too hard material as they are fabricated quite precisely and the cutting edges at the tip are ground very smooth (cylindrical reaming and honing awls are not available in such small dimensions). Last step was grinding the cylinder bore with 5µm and 1µm diamond polish. This was done by spinning the cylinder in the lathe and moving an injection pin with diamond paste on it aft and forth in axial direction. Finally the bore and thread for the head valve were made.

The piston is made from plastic ("Delrin") and the gas sealing to the cylinder wall is made with a lip seal (like the Modela motors have). The connecting rod (made from brass) has a ball head on one end (diam. 0.25 mm) and is clicked into the piston into a ball pan. The knife for manufacturing this pan was made under a magnifying lens with a diamond file. The astonishing thing for me was that at such small dimensions the eye and the feeling in the fingertips become very precise measuring instruments - even more accurate than the measuring wheels on the lathe. So the ball pan into the piston was made by guiding the knife with the hands and carefully scraping out the form little by little - and not having the knife mounted to the lathe as this is usually done when turning.



RAINIMOT 2x 0,79mm³ TWIN
DISPLACEMENT: 2x 0,79mm³
BORE & STROKE: 1x1mm
WEIGHT INCL. TANK, PROP: 0,7g

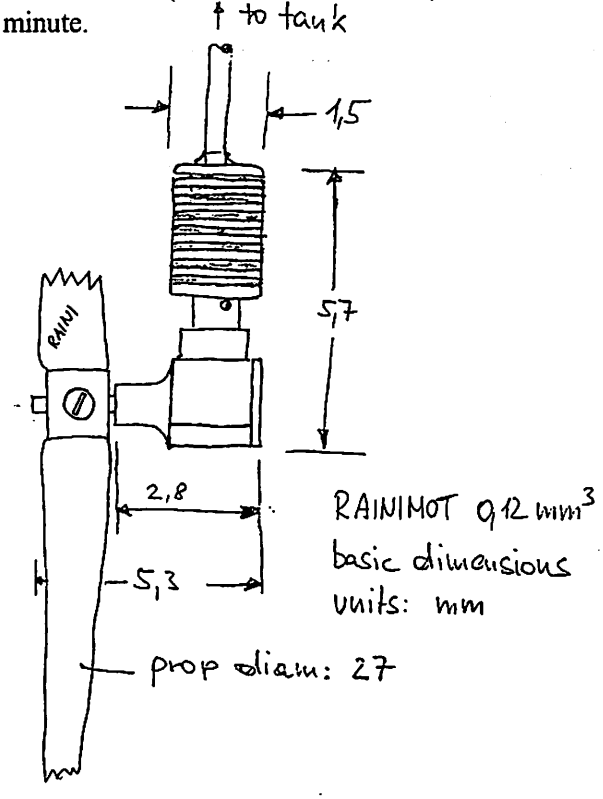
Manufacturing the other parts of the motor was more or less conventional. For the crankshaft first the shaft going to the propeller (0.4 mm diam.) was turned, ground and polished (with grinding paper Nr. 1000 and polishing paper put on a flat metal rod). Afterwards the rear side with the conrod shaft (0.4 mm diam.) was turned by clamping the whole thing excentrically to the lathe. The crankshaft bearing was made from brass with the inner bore drilled first and smoothed with an injection pin as described above. It was pressed into the crankcase (which is made from aluminium). The tank is made from aluminium with the filling valve built in, so that there is no valve in the filling nozzle and it can even be removed to save weight for flying. Propeller blades were shaped from lime-wood. The twist was obtained by forming them on a cylinder (like an indoor prop) and then glued to an aluminium center section that also has two radial threads in it to clamp the propeller to the crankshaft with two small screws (like propeller mountings on electric motors).

Then, finally late in some night, the tank was filled and after some popping and puffing it made its first cry - or let's say the first hum as the sound is almost inaudible!

To finish, some technical data:

displacement:	0.12 mm^3,
bore:	0.5 mm,
stroke:	0.6 mm,
weight:	0.2 g (incl. prop, tank),
motor only:	50 mg,
max. RPM:	about 12000,

max. runtime (on Mini-Stick Canard): about 1 minute.



You see, not much of a secret, building a CO_2 engine, some patience, one half of a beer in your blood (not less, not more for minimum "trembling amplitude" of your hands) and then it goes step by step, like building indoor models which is as well a long process until one has developed ones personal building techniques.

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New Record

At the USA Record Trials in Santa Ana on Nov. 5 Steve Brown set a new U.S. Cat IV F1D record with a 52'46 flight. This was with a 65 cm model and also is the world's best time in this class. His ship climbed to about 95 ft (29 m), then changed pitch at about 20-22 minutes and peaked at about 140 ft. No steering was required.

1995 Japan vs USA F1D Postal Contest

Report by Tom Vallee (USA)

This contest was an epic struggle and perhaps the classic contest of this series. For the American side the unsung heroes of the contest were the members of the Cleveland team. The American flyers owe special thanks to local organizer Doc Hacker, and the Cleveland Clowns. They made a major effort in spite of terrible air conditions which caused massive model destruction.

We had a very strong contest. While we expected this, nobody expected the contest to be as strong as it turned out to be. The top flyers from both sides were simply outstanding! Eight flyers broke 30 minutes. To place.... you had to break the world record. That's right! The top three all broke Bob Randolph's Cat. I world record. That's what I call a tough contest! Special congratulations to record breaking flyers Kazumasa Kihara - 1st (75'42) and Satoshi Kinoshita - 2nd (75'11), and Steve Brown - 3rd (75'00). Two flight totals like these used to win in air docks.

The Japan - Kawasaki team, lead by Kihara and Kinoshita, posted a record total for the contest. They won the competition by a convincing margin. Bob Randolph's California Flyers made a very good showing for second place. Third place was won by the Japan - Tokyo team, lead by contest organizer Shigeyoshi Nonaka.

On behalf of the American flyers I should like to congratulate Mr. Nonaka and the Japanese flyers for

JAPAN Vs UNITED STATES
1995 F1d POSTAL CONTEST

RESULTS BY INDIVIDUAL

Side		Contestant Name	1	2	3	4	5	6	Best 2
Japan	1	Kazumasa Kihara	35:53	15:05	27:44	37:04*	38:38*	----	75:42
Japan	2	Satoshi Kinoshita	37:50*	37:21*	20::39	----	----	----	75:11
USA	3	Steve Brown	33:55	37:38*	37:22*	----	----	----	75:00
USA	4	Stan Chilton	33:11*	26:55	31:42	36:20*	----	----	69:31
USA	5	Bob Randolph	34:47	25:49	01:32	01:47	29:58	----	64:45
Japan	6	Masatoshi Misawa	29:35	00:54	31:51*	29:53*	08:59	----	61:44
Japan	7	Yoichi Ichiyama	00:29	31:03*	03:42	03:08	30:40*	----	61:43
USA	8	Thomas Vallee	24:01	29:22*	26:23	29:12*	09:29	25:49	58:34
USA	9	Jesse Shepherd	09:57	28:59*	08:25	22:08	27:15*	----	56:14
Japan	10	Yasutaka Tanaka	23:39*	20:20	20:20	07:48	31:52*	----	54:31
USA	11	Dan Belieff	21:32	24:40*	06:24	27:32*	----	----	52:12
Japan	12	Shigeyoshi Nonaka	06:09	29:33*	18:21	12:31	22:12*	----	51:45
USA	13	Bob Gibbs	27:04*	09:01	01:27	22:59*	22:18	----	50:03
USA	14	Bill Hulbert *	17:17*	20:46*	----	----	----	----	38:03
USA	15	Larry Mzig	10:05	10:31	14:22	15:14	15:42*	21:11*	36:53
USA	16	Larry Loucka	12:51	15:53	17:25	14:28	18:04*	18:42*	36:46
USA	17	Phillip Kleinert	12:57	17:03	17:05*	17:39*	----	----	34:44
USA	18	Jim Clem	15:00	16:23*	15:15*	----	----	----	31:38
USA	19	Don Sluscarczyk	----	----	12:40*	12:10*	----	----	24:50

* Local Contest Director allowed Bill Hulbert to fly as individual , ie team of one

JAPAN Vs UNITED STATES
1995 F1d POSTAL CONTEST
RESULTS BY TEAM

1 Japan - Kawasaki

Contestant Name		Best 2	Team Total
Kazumasa Kihara	37:04*	38:38*	75:42
Satoshi Kinoshita	37:50*	37:21*	75:11
Masatoshi Misawa	31:51*	29:53*	61:44
			212:37

2 USA - California Flyers

Contestant Name		Best 2	Team Total
Steve Brown	37:38*	37:22*	75:00
Bob Randolph	34:47	29:58	64:45
Bob Gibbs	27:04*	22:59*	50:03
			189:48

3 Japan - Tokyo

Contestant Name		Best 2	Team Total
Yoichi Ichiyama	31:03*	30:40*	61:43
Yasutaka Tanaka	23:39*	31:52*	54:31
Shigeyoshi Nonaka	29:33*	22:12*	51:45
			167:59

4 USA - Great Plains/Southwe

Contestant Name		Best 2	Team Total
Stan Chilton	33:11*	36:20*	69:31
Jesse Shepherd	28:59*	27:15*	56:14
Jim Clem	16:23*	15:15*	31:38
			157:23

5 USA - East Coast

Contestant Name		Best 2	Team Total
Thomas Vallee	29:22*	29:12*	58:34
Dan Belieff	24:40*	27:32*	52:12
Phillip Kleinert	17:05*	17:39*	34:44
			145:30

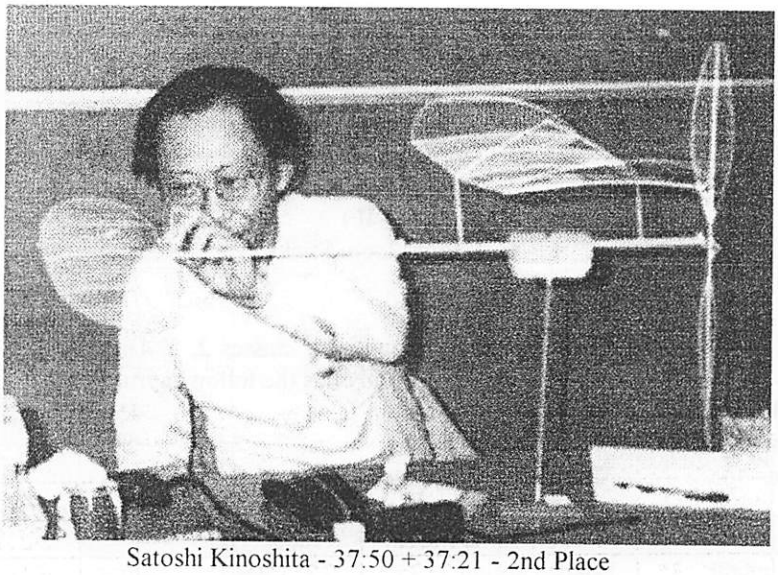
6 USA - Cleveland Clowns

Contestant Name		Best 2	Team Total
Larry Mzig	15:42*	21:11*	36:53
Larry Loucka	18:04*	18:42*	36:46
Don Sluscarczyk	12:40*	12:10*	24:50
			98:29

7 USA - Cleveland Clowns2

Bill Hulbert *	17:17*	20:46*	38:03
			38:03

* Local Contest Director allowed Bill Hulbert to fly as individual , ie tea



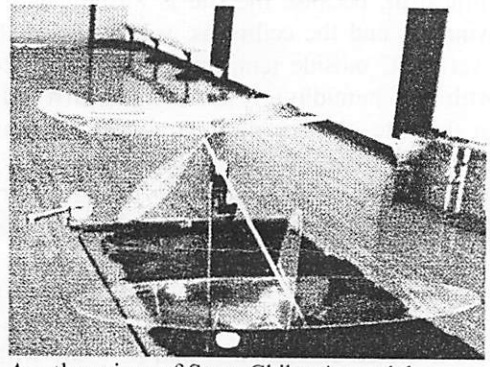
Satoshi Kinoshita - 37:50 + 37:21 - 2nd Place



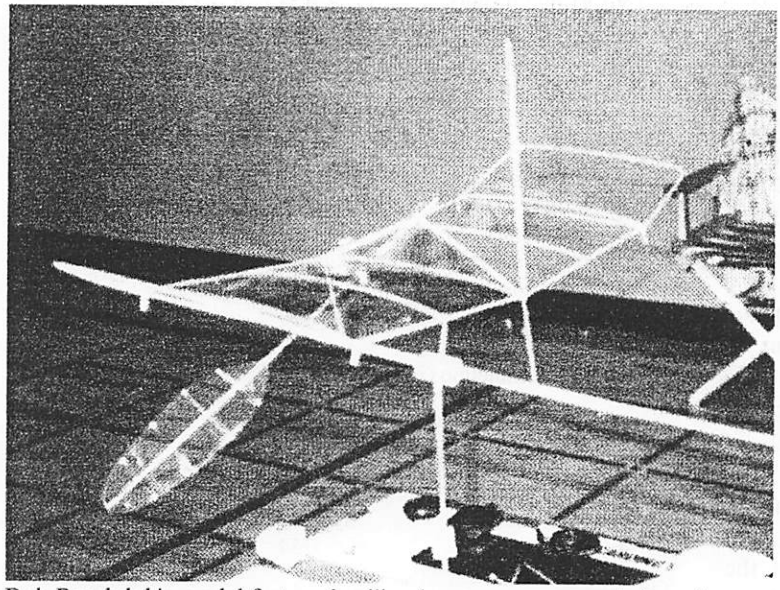
Steve Brown-37:38 + 37:22 - 3rd Place



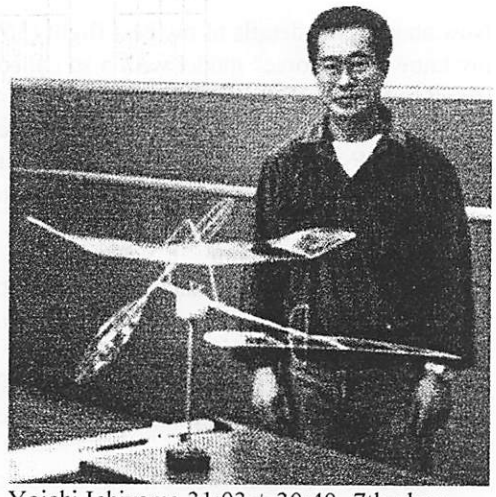
Stan Chilton - 33:11 + 36:20 4th Place



Another view of Stan Chilton's model. A beautifully built model with an efficient V.P. prop.



Bob Randolph's model featured ceiling bumper to protect it from hang ups. Bob - 34:47 + 29:58 stood 5th.



Yoichi Ichiyama 31:03 + 30:40 -7th place. A talented modeler and builder, Mr. Ichiyama is a former world championship team member.

outstanding, record breaking performance and a well deserved contest win. The high times in this contest have lead to speculation that Cat. I flights of 40 minutes are possible! We look forward to the next F1D Postal Contest with great interest.

AOK Cup, Stuttgart

Report by András Reé (HUN)

(For results see last issue)

This contest was organised on an invitational basis (but not all of the invited teams could attend) and it was sponsored by some companies (one of them was the AOK health insurance company).

The site was a 7.03 m high gym with flat, ribbed metal plate covered ceiling, so models could scrub it. The area was as big as a handball field. The air was calm with little drift, because the site is airtight with just small windows and the ceiling is well insulated (besides the over 30°C outside temperature there was 24°C inside with 70% humidity). It was even the first indoor contest in this site, the best flight was just 13 seconds below Randolph's Cat. I world record. Orsovai (31'49, 32'16) and I (34'01, 36'27) set four new Hungarian Cat. I records (the old was 30'53).

We had to steer a lot, because sometimes there were three models scrubbing the ceiling at the same time. We had to watch continuously and be ready with the poles to steer at any time, co-operating with the other competitors that flew at the same time. Only one collision happened because the competitors didn't steer in time. The site proved to be good for indoor and with a little more strict contest management higher participation can be possible.

Now about some details of my best flight (36'27). I used my known "Indooree" model with a so called "antenna" (fixed to the top of the cabane and braced to the leading edge) to help the smooth scrubbing. The 562 mm diameter VP prop was adjusted to a low pitch of 800 mm. I cannot tell the upper value, but I reduced a little. The rubber was TAN II (March '95, 1/4in), the 2 g/m loop was 330 mm long. I wound 1740 turns and launched after 130 turns back-off. The model reached the ceiling at 50 seconds and scrubbed uo to about 30 minutes. At landing there were 90 turns left in the rubber. I had launched the model at 19:35 (the site was a little better in the evening hours than before noon).

Summarising the experiences, it was a good contest in a good site. We have enjoyed also the hospitality and friendship of the organisers. Thanks to them for the hard work and all of their efforts. We are ready to return.

Indoor Classes in Finland

by Kai Halsas (FIN)

There are now five official Indoor Classes in Finland:

1. Beginners class
2. F1D-Beginner
3. Peanut (F4F)
4. Living Room Stick
5. F1D

International rules apply for classes 2, 3, 4 and 5. The beginners class currently has the following rules:

Max. projected span	450 mm
Max. wing chord	80 mm
Max. propeller diameter	200 mm
Max. stab area	1/3 of wing area
Min. airframe weight (w/o rubber)	6 g
Rubber weight	Free
Type of plane	Monoplane only
Type of propeller	Plastic or balsa
Covering	Free, no microfilm

A design contest will be held to design a new plane for this Beginners class.

Indoor Contest in Finland

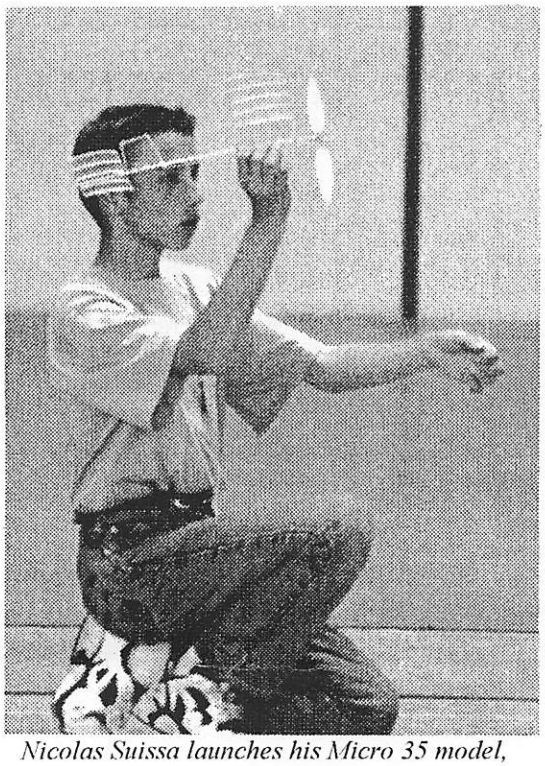
An Indoor contest was held in classes F1D-B, Peanut and LRS on Dec. 9 in a school gymnasium. Ceiling height was 8 m (26'). Two best flights from six rounds. For Peanut only flight time was taken.

	Best 2		Total
F1D-B			
1. T.Linkosalo	6'24	6'05	749
2. K.Halsas	6'24	5'11	695
3. L.Santala	6'03	5'31	529
4. J.Lauren (jun)	4'31	4'18	529
5. H.Raulio	3'44	4'40	504
6. T.Westlin	4'08	2'03	371
7. T.Lauren	2'00	3'08	308
LRS			
1. T.Westlin	5'27	5'35	667
2. J.Lauren (jun)	5'20	5'09	629
3. H.Raulio	5'03	4'41	584
4. A.Saikkonen (jun)	4'55	4'43	576
5. T.Linkosalo	3'31	3'57	448
6. K.Halsas	3'59	3'07	426
7. L.Santala	4'02	2'28	390
8. O.Heikinheimo (jun)	1'52	2'51	283
Peanut			
1. T.Linkosalo	1'36	1'31	187
2. T.Westlin	1'32	1'27	179
3. K.Koskinen	0'58	0'58	116
4. J.Lauren (jun)	0'54	0'55	109

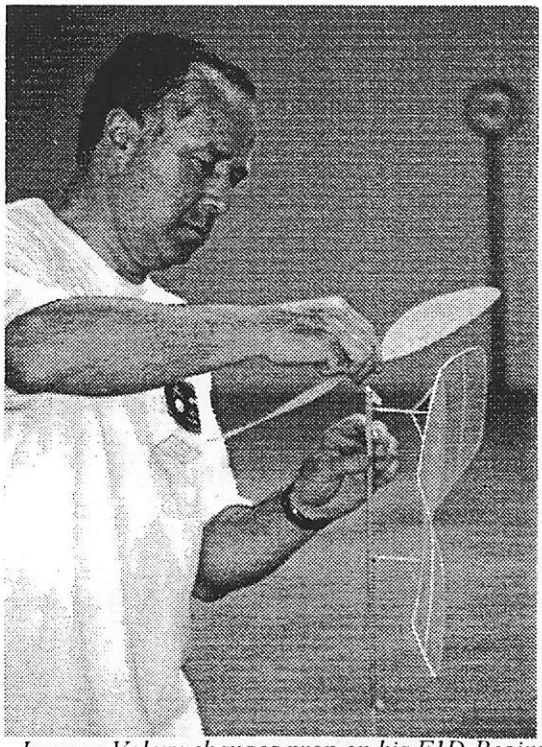
1995 French Indoor Championships

Mont de Marsan, 8-9 July 1995

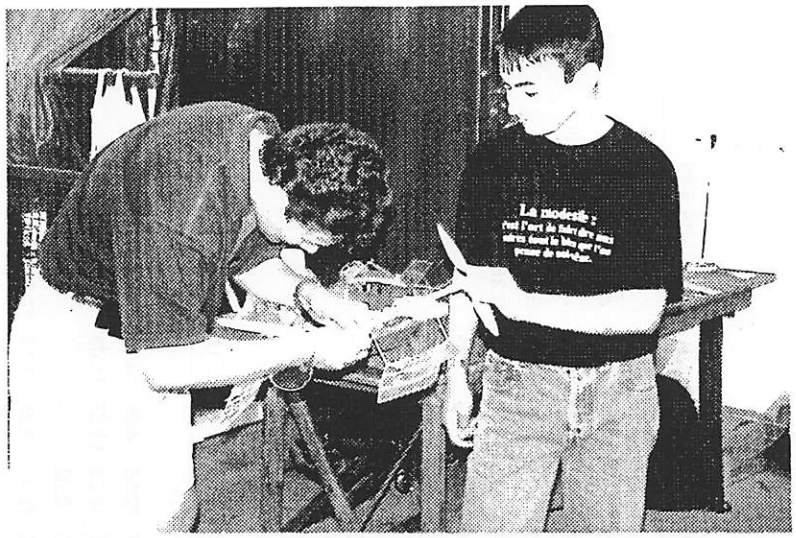
(Photographs by Daniel Bizet, for results see last issue)



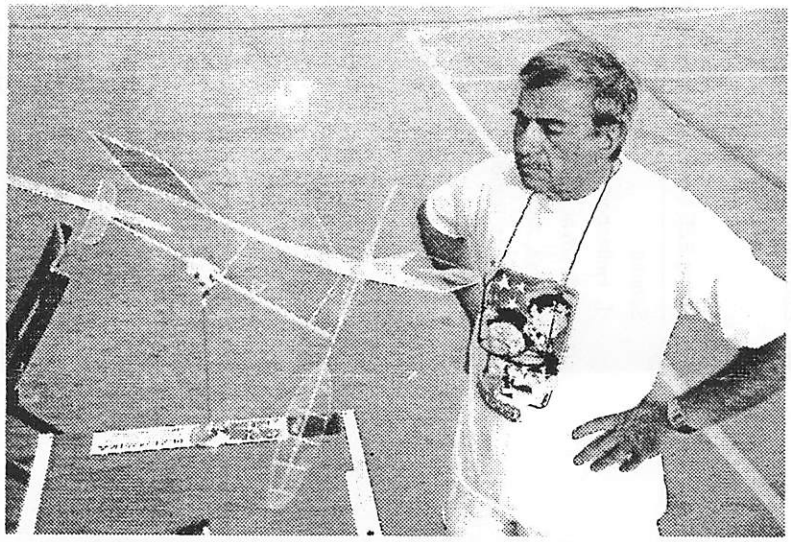
Nicolas Suissa launches his Micro 35 model, a Jacques Delcroix design



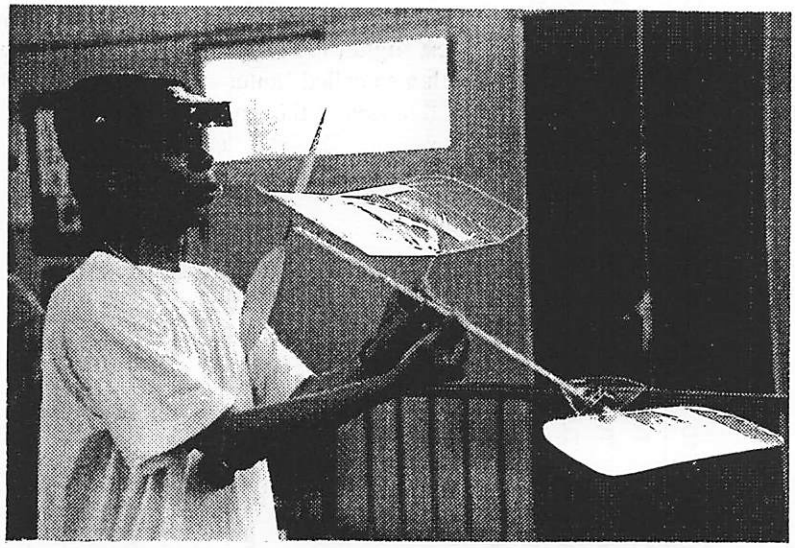
Jacques Valery changes prop on his F1D-Beginner model



Paul Teisson holds for Gérald Garcia, who's Micro 35 Alfred Klink design (Vol Libre p. 2922-24) did 7'21 and 7'28, much to his delight!



Jean-Francis Frugoli's 5th flight ended on a lamp, which resulted in a large hole in his microfilm wing. Model still did 22'02!



Trung Hua Ngoc checks warps of his F1D-Beginner model. He used a VP prop.

Champs of Budapest, F1D		June 24-25, 1995				T U B	(Cat.II, 14.9 m)	
1. Orsovai, Dezső	TUB	25:10	30:05	19:35	24:30	-	-	55:15
2. Reé, András	TUB	16:05	17:26	17:10	36:53	14:02	17:35	54:28
3. Botos, István	TUB	10:30	22:22	20:32	8:05	10:14	5:06	42:54
4. Hellenbort, Csaba	TUB	13:00	7:52	9:57	10:03	9:23	12:00	25:00
5. Bakos, Ferenc	TUB	0:04	-	-	-	-	-	0:04

NB: Bad air because of terrible weather outside. The best flight (36:53) happened in a good moment of the site, but the model couldn't climb higher than about 9 m.

TUB – Technical University Budapest

Várszegi Memorial, F1D		July 8-9, 1995				T U B	(Cat.II, 14.9 m)	
1. Orsovai, Dezső	TUB	39:36	19:14	41:49	43:11	-	-	85:00
2. Reé, András	TUB	36:18	40:23	41:45	41:48	39:08	-	83:33
3. Bakos, Ferenc	TUB	21:13	28:35	33:08	31:43	-	-	64:51
4. Botos, István	TUB	25:34	3:36	30:21	30:04	29:49	-	60:25
5. Hellenbort, Csaba	TUB	10:13	9:52	11:06	10:18	-	-	21:24
6. Bíró, Károly	TUB	9:01	3:45	12:22	-	-	-	21:23

Cat.II. Hungarian records: 40:23 Reé (July 8)
41:49 Orsovai (July 8)
43:11 Orsovai (July 9)

Hungarian Champs, F1D		Aug. 26-27, 1995				Debrecen	(Cat.III, 29.3 m)	
1. Orsovai, Dezső	TUB	36:55	36:39	38:43	35:37	39:11	38:28	77:54
2. Reé, András	TUB	19:31	33:23	40:55	32:51	30:25	34:51	75:46
3. Sükösd, Zoltán	TUB	26:01	24:26	23:37	28:41	29:01	31:50	60:51
4. Botos, István	TUB	10:40	6:12	29:21	24:59	27:26	30:08	59:29
5. Hellenbort, Csaba	TUB	15:10	12:53	1:02	13:41	4:32	12:51	28:51
6. Bakos, Ferenc	TUB	16:40	10:27	-	-	-	-	27:07
7. Lannert, András	TUB	2:00	1:32	3:10	3:12	3:02	3:36	6:48

Spring EZB Meeting, F1L		May 14, 1995				T U B	(Cat.II, 14.9 m)	
Seniors								
1. Hellenbort, Csaba	TUB	6:19	3:00	3:37	11:37	10:14	4:56	21:51
2. Orsovai, Dezső	TUB	8:50	2:36	8:27	1:37	8:27	-	20:27
3. Reé, András	TUB	6:56	7:43	9:27	3:30	8:26	6:38	17:53
4. Kreisz, Rudolf	Bp K	3:45	7:50	9:13	5:10	8:05	3:35	17:18
5. Bíró, Károly	TUB	5:31	8:11	5:52	-	-	-	14:03
6. Horváth, György	TUB	3:08	4:00	3:58	-	-	-	7:58
Juniors								
1. Lannert, András	TUB	2:18	1:50	2:16	2:52	-	-	5:10

Autumn EZB Meeting, F1L		Sept. 17, 1995				T U B	(Cat.II, 14.9 m)	
Seniors								
1. Reé, András	TUB	8:28	14:47	12:55	4:20	14:11	-	28:58
2. Hellenbort, Csaba	TUB	13:07	13:55	13:22	11:55	11:03	-	27:17
3. Orsovai, Dezső	TUB	12:43	13:05	2:02	-	-	-	25:48
4. Bakos, Ferenc	TUB	11:14	2:06	12:36	1:25	7:52	11:28	24:42
5. Bíró, Károly	TUB	11:33	13:06	6:29	9:18	-	-	24:39
6. Kreisz, Rudolf	Bp K	9:27	7:09	10:40	6:10	9:34	7:30	20:14
7. Sükösd, Zoltán	TUB	8:26	8:00	7:52	4:36	3:52	6:36	16:26
8. Horváth, György	TUB	5:40	6:23	5:49	-	-	-	12:12
Juniors								
1. Sükösd, Tamás	TUB	8:02	9:58	5:18	7:11	6:17	6:45	18:00
2. Lannert, András	TUB	2:40	2:48	3:01	3:02	1:40	2:14	6:03

COTTAGE WINGS
A Source Guide
Update October 1995

This guide is compiled for Free Flight Scale Modelers by myself, Bill Warner, 1370 Monache Av., Porterville, CA 93257. Ph. 1(209)782-9265. It is not connected in any way with the AMA, and the endorsements, where they occur, are the result of my personal experience or as noted. Please send and additions or corrections to me at the above address. This guide is available for $1.00 and a large SASE with 2 stamps. It is a non-profit undertaking, and newsletter editors and others may feel free to copy as they see fit.

Note: Prices quoted may be out of date, as may be some addresses. Prices are usually for the U.S. market and will probably be higher abroad.

ABOUT LRS MOTORS (Tan II)

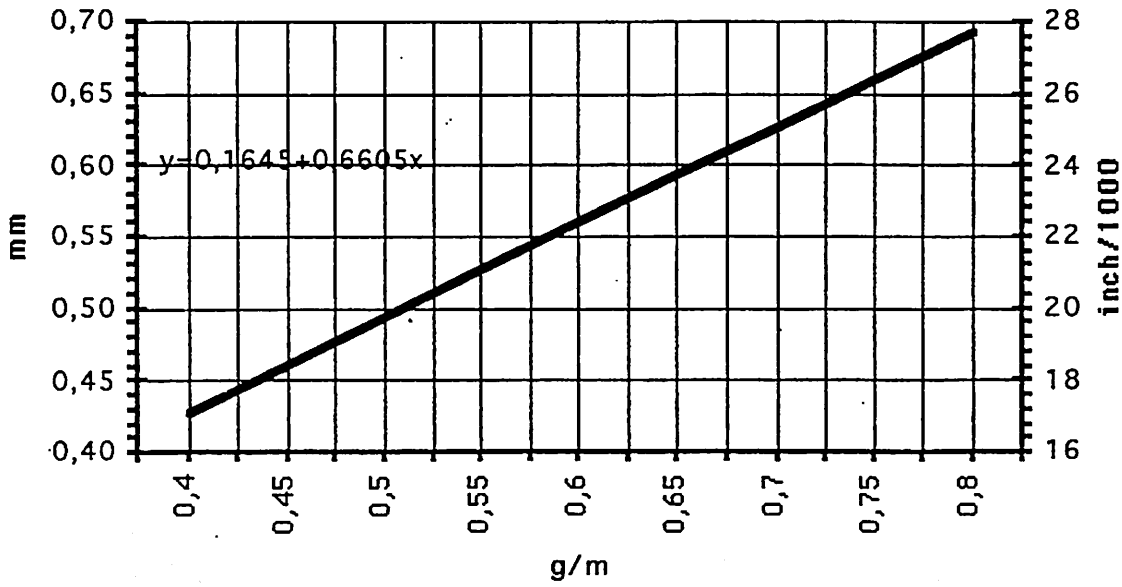
KAI K. HALSAS

UNIT WEIGHT

The LRS (Mini-Stick) is, with a min, weight of 0.425 g, probably the lightest Indoor Model at present time.The motor of this model is consequently also quite light and narrow. A precision stripper is needed to cut the rubber strips.
It is difficult to measure the width of the strip with a caliper or a micrometer.
A more convenient, and probably a more accurate way, to measure the rubber size is to check the rubber unit weight eg. in g/m. One meter length of strips are cut and the strips are weighted with an Indoor Scale. From a one meter length one usually gets at least one LRS motor The rest of the strip can be used for example for test purposes.

I have compared the width of the strip and the unit weight. The result is shown in Fig.1

Fig.1



MAX.TURNS

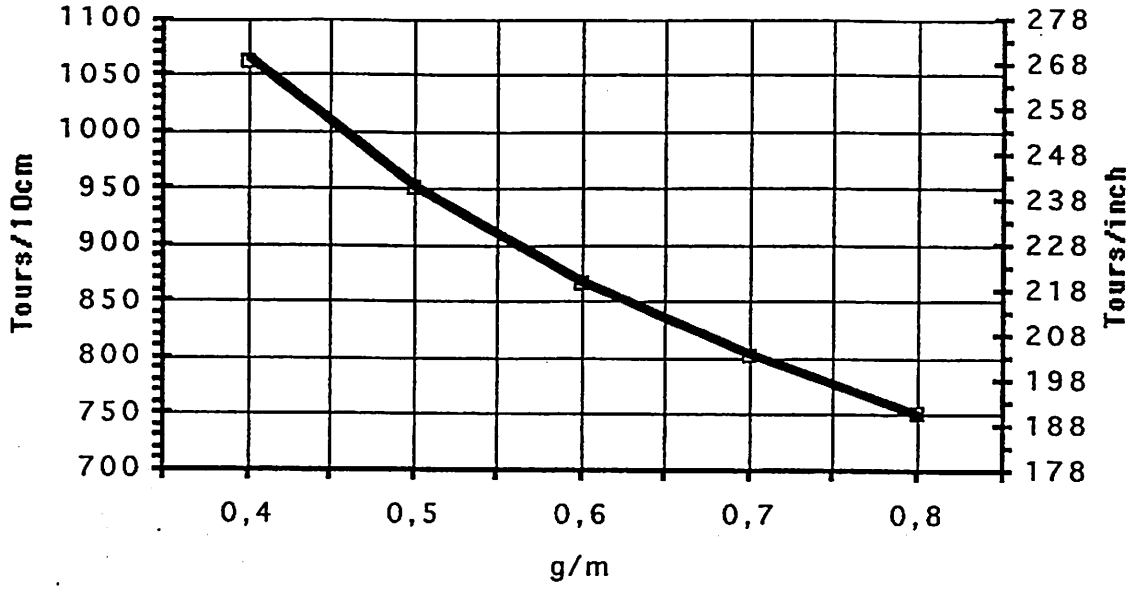
I am calculating available turns for the LRS motor using the following formula:

$T_{max} = k\sqrt{\frac{l}{g}}$ where l = loop length in cm, g = motor weight in grams and k is a coefficient. I am using k = 9,5 for Tan II (Pink) based on some tests I have made.
In figure No 2 is shown max turns per 10 cm, respective turns per one inch as a function of unit weight (g/m).

DESIGN EXERCISE

The LRS model is built to the weight of :.435 g. Motor weight is taken as 85% of the airframe weight = 0,85 x 0,435 = 0,37g.
Motor (loop) length 30,5 cm. Unit weight will be 0,61 g/m. Strip width from Fig.1 0,57 mm (= .022"). From Fig.2 we find that max. turns per 10 cm is 860 . Max turns will be 3,05 x 860 = 2630. To be on the safe side we take 90% of 2630= 2370 turns.

Fig.2



COLLECTED DATA.

I have collected some motor data mainly from drawings published in Indoor Newsletters. I would appreciate receiving detailed information from possible readers.

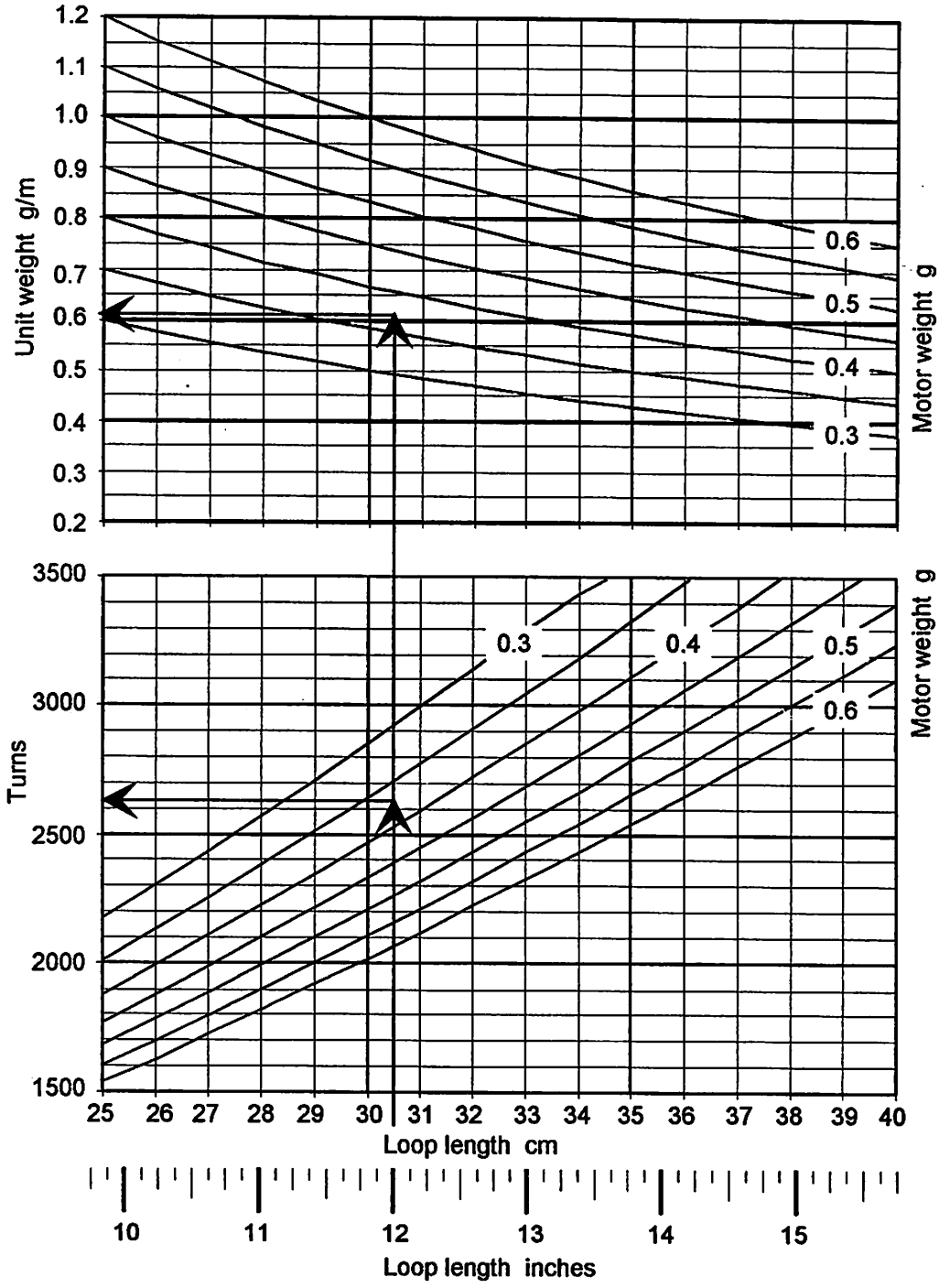
TABLE No 1

Model	Loop inch	Loop cm	Strip inch	Strip mm	Motor grams	Strip g/m	Turns	Turns	%[1]
B.Eberle	12[2]	30,5	.027	0,69	0,46	0,75	2820	2235	108
J.Parker	12	30,5	.023	0,58	0,38	0,62		2460	89
J.Krush	10-16	25,4-40,5	.024-.032	0,61-0,81					
-"-	14	35,6	.026	0,66	0,51	0,72	2650	2676	120
Johnson	10	25,4	.020	0,51	0,27	0,53		2320	64
"Tiddly -Wink"	11-12	27,9-30,5	.023-.025	0,58-0,64					
J.Triolo	14	35,6	.019	0,48	0,37	0,50	2400	3140	87
Trung H.Ngoc	10	25,4	,020	0,50	0.26	0,51		2260	61
Jap. T.Vallee		32,o	.018	0,46	0,295	0.46	1950	3000	69
Linstru.	10-12	25,4-30,5	.030	0,76					
S.Fink	12	30,5	.025	0,64	0,42	0,69		2340	99
Frugoli	11	28	.033	0,82	0,55	0,98	1850	1350	129
Alvirez	13	33	.024	0,61	0.37	0,66	3200	2800	87
Halsas	12	30,5	0,23	0,53	0,37	0,61	2490		87
L.Barr	12	30,5	.023-.032	0,58-0,81					

[1] Motor % of airframe weight
[2] All bold figures are reported, all others calculated by author

NOMOGRAM FOR MINI-STICK (LRS) MOTORS. (TAN II)

KAI K. HALSAS, ANTTI T. JOLMA



DESIGN EXERCISE

The model is built to to the weight of 0.435 g. Motor weight is calculated as 85 % of the airframe weight, 0.85 x 0.435 = 0.37 g. Loop length is decided to be 12" (30.5 cm).
A vertical line is drawn from 12" at the loop length scale until it hits the motor weight line 0.37 g in both parts of the nomogram.
We read from the bottom nomogram max. turns available as 2630. To be on the safe side we use only 90 % of max. turns = 0.9 x 2630 = 2370 turns.
From the top part we read the motor strip unit weight as 0.61 g/m. With the rubber stripper we try to cut a 1m strip as close as possible to the weight of 0.61 g

A Motor-loading Jig for Scale and Cabin Models

by Roy Markham (CAN)

(from SAM 86 Speaks)

The usual method of winding the rubber motor of a scale or other model aircraft with a full fuselage is to leave the motor in the fuselage while winding. To protect the aircraft from a motor which breaks during winding a "blast tube" must be used, which sometimes is too much of a bother to install, and which also necessitates an extension to the winder to allow removal of the tube. If a torque meter is used it is usually mounted onto the spinning shaft of the winder. All in all, the winding system is a complex and rather awkward arrangement.

Wouldn't it be nice if you could wind the motor of a cabin model **externally** of the fuselage, and transfer the fully wound motor to the model in the same manner as you do for stick and No-Cal models? Winding the motor externally has some very distinct advantages:

- You can use the same bench-mounted torque-meter/stooge arrangement and simple winding equipment as you use for your stick models;
- The model is **completely** protected from a motor which breaks during winding;
- You can examine the wound motor easier, re-arrange knots, etc., before mounting the motor in the aircraft.

Well, you **can** wind motors for cabin models externally. All you need is a jig to load the wound motor into the aircraft through the nose section. I started using a simple motor-loading jig for my cabin models a year ago, and several others in the Markham Group have since picked up on the idea and have developed their own innovations. The system is very simple to use, and has saved many aircraft from destruction from a broken motor. Alex Pafiolis calls his the "Thank you, Roy!" jig, because each time he breaks a motor while winding externally, with no damage to the aircraft or to his composure, he says "Thank you, Roy!".

The loading jig is a device which will allow the transfer of a fully-wound motor, with nose-block and prop on one end and a small adapter hook on the other, from the winding equipment to the aircraft. The loading jig is inserted through the nose until the adapter hook can be hooked over the tail-peg of the aircraft (the jig is built long enough so that there is still a half-inch or more protruding from the nose). Then the nose block is removed from the jig and held to one side, and the jig withdrawn leaving the adapter hook in the aircraft. Finally, the nose plug is fitted to the aircraft, ready for flight.

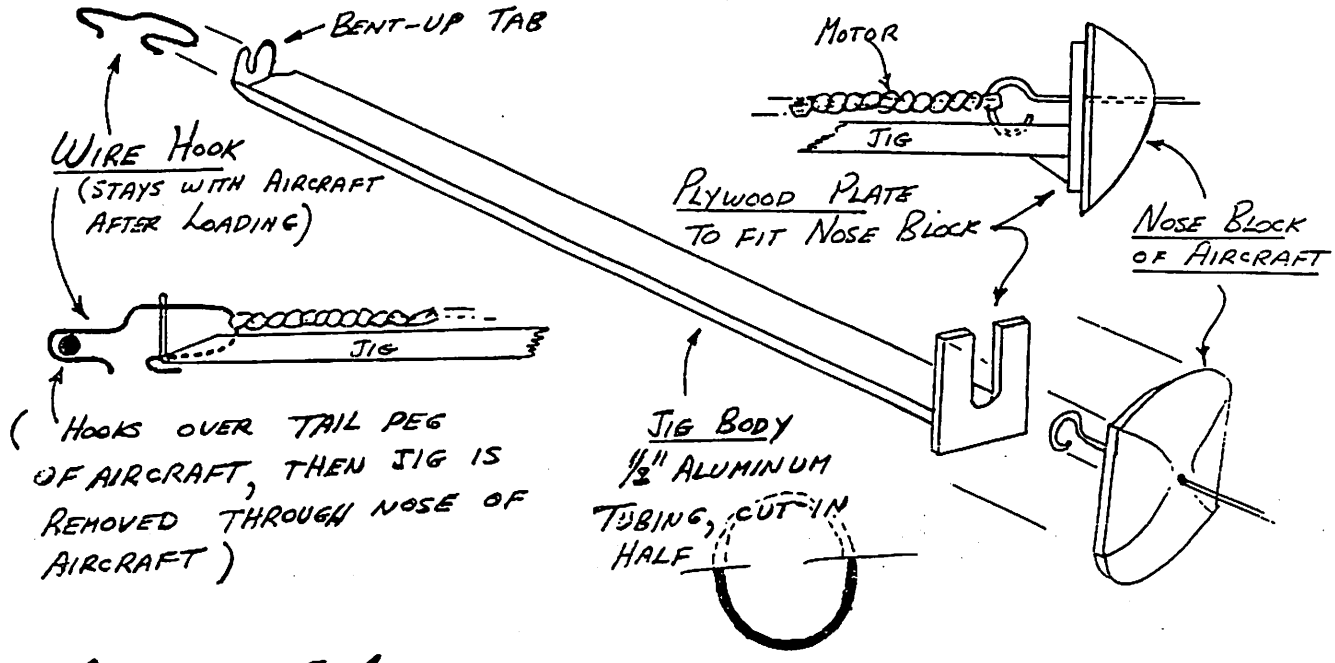
The attached sketches show the first jig that I tried, using a half-cylinder of aluminium as a jig body (made from ½" aluminium TV antenna tubing). This rig works well, but the bent-up tab used to hold the wire adapter hook sometimes gets caught while withdrawing the jig from the aircraft. Alternative 1 is a variation developed by Barry Fletcher, using a simple stick for the jig body, which allows for easier withdrawal because there is nothing on the jig to catch on the way out.

Finally, for ultra-light competition aircraft (such as the Manhattan cabin, etc.) alternative 2 shows an arrangement which does not require the extra weight of an adapter hook. The jig holds the tail-peg itself, which can be hooked into slotted peg holes in the aircraft. The peg is wider than the aircraft, but still short enough to fit diagonally through a rectangular fuselage. To adapt the peg to a bench mounted torque meter/stooge I use a wire hook (inserted into the ends of the tail-peg) which is removed when the wound motor assembly is mounted to the jig ready for transfer to the aircraft.

Still another variation of the tail-peg version would be to use a hollow (tubing) tail-peg or bobbin, narrower than the aircraft, and fasten it in the aircraft with a wire pushed through the fuselage and bobbin prior to withdrawal of the jig.

So far, the jig idea has worked like a charm for those in the Markham Group who have tried it. There are, no doubt, many other variations and innovations of the loading jig. I would be interested in hearing about **your** innovations and experiences if you give the system a try.

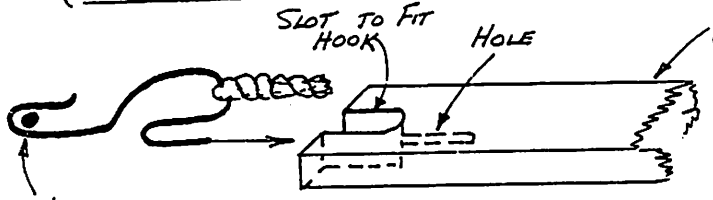
LOADING JIG FOR WOUND MOTORS



ALTERNATIVE 1

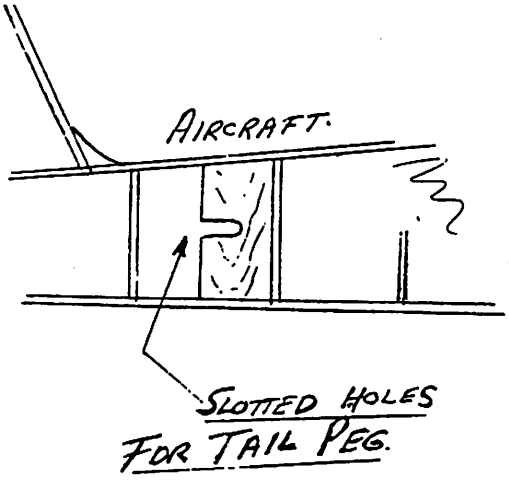
(USING A STICK FOR A JIG BODY)

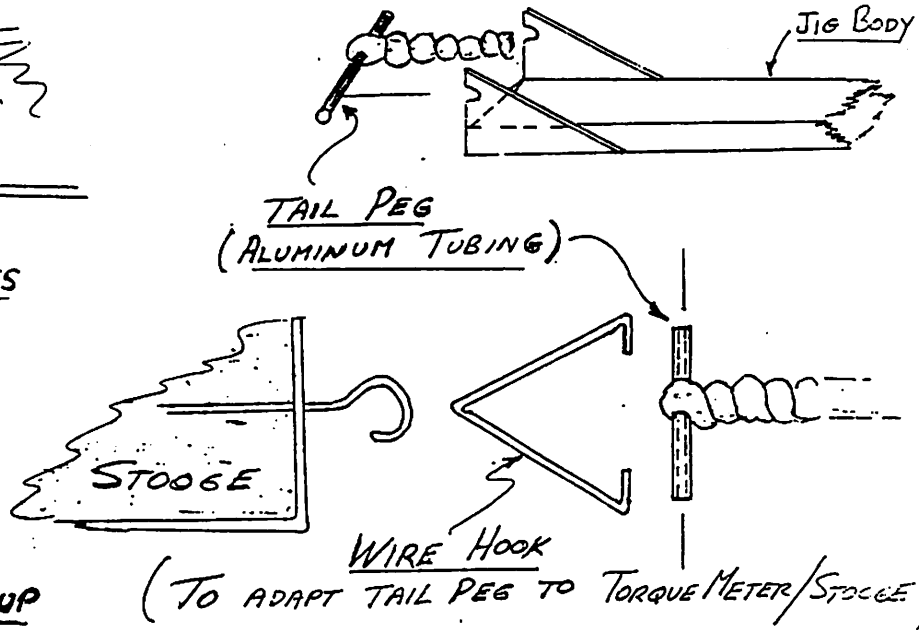
NOT TO SCALE



ALTERNATIVE 2

(USES THE ACTUAL TAIL PEG OF THE AIRCRAFT)





ROY BOURKE
MARKHAM INDOOR GROUP

The Future of F1D

by Thedo André (NED)

In a recent letter András Reé (HUN) expressed his concerns about the decreasing number of competitors, lack of flying sites and organisers for holding F1D World or European Championships. There are more threats to the class and what follows is a discussion between András and me about the future of F1D Microfilm. You are invited to join the discussion and send your views for publication in Indoor News.

Letter from András Reé:
Last year the European Championships, which were to be held in the Salt mines in Rumania, had to be cancelled because of serious water damage to the lift fixtures. This situation with the salt mine and the very high standard of flying at the US team selection contest strengthened me to continue my tests on the way to reduce the performance of our F1D models while keeping on the style and the spirit of indoor flying. We may well loose the salt mine and the Romanian activity in organising championships, and nobody will build for us sites like Akron. ***We urgently need new competitors, new sites and new organisers - therefore we have to reduce the extreme high performances and fit them to the possibilities.*** Note: at the moment there is no host for the next European Championships.

I have made some test flights with ***0,5 g rubber*** on my present model. The 0,5 g is about one third of our present rubber weight, even then there is hope to reach about 60% of the present good flights. With a strongly overpowered and just roughly adjusted model I have reached 50% in our 14.9 and 29.3 m sites. In both cases the model deadsticked at about 12 and 20 m height. The flying style was very nice with less speed and lower prop RPM, because the total weight was reduced by about one gram. I used a piece of 0,3 mm wire - with hooks on both ends - before and aft of the rubber to keep the CG in place with this very short loop. This way the length between hooks was 150 mm compared to my usual 400 mm motorstick. Next time I will fly with thinner and longer rubber.

Reply from Thedo André:
I agree with your concerns about the future of F1D. We indeed need new competitors, but where will they come from? Interest in indoor flying and free flight flying continues to decrease and even radio control flying is now loosing its attractivity. Even if we could find more and better flying sites or better rules specifications this will hardly have any effect at all on the number of flyers. What is really needed is more publicity for indoor flying and, more importantly, local clubs which spend considerable time and effort on teaching beginners and youngsters.

This does not mean that we should not reconsider the rules for F1D. The class has become too complicated because of the large size models, variable propellers, extremely long flights, etc.. I have some doubt whether a reduction of rubber weight to 0,5 gram would be practical. How will you check the weight: lubricated and incl. O-rings? I don't think that that will work in practice. No-one checks the 1,5 gram motor weight at a F1D-Beginner contest. The models will still be complex and maybe even more fragile as they can now be flown on maximum torque without back-off. Your proposal somewhat resembles flying on half motors. In that case no motor weight has to be checked. The French and Germans have flown their championships this way for many years. They stopped using this method because they found that it put them at a disadvantage at full motor World Championships. But as everybody is flying on half motors this would not be a problem.

Flying on 0,5 gram rubber or on half motors will still not help solving the beginners problem. I am convinced that a heavier and more sturdy F1D model will attract more flyers. Look at the popularity of Bernard Hunt's No Hassle design. It is tried by beginning flyers all over the world. People are really scared off by fragile braced wings. I think there is room for a class inbetween F1D Microfilm and F1D-Beginner. The rules for such a class could be as follows:

- minimum weight w/o rubber 2 gram
- wing span 65 cm
- total area of lifting surfaces 15 dm^2 max.
- no use of boron
- no variable propellers or fancy gadgets

Because I (as well as you) do not want to loose our wonderful microfilm models my proposal is to run a World Championship in two classes: a **Master Class** acc. to the current F1D rules and a **Standard Class** (with team championship) acc. to the above rules. The Standard Class has many advantages:

- models can be covered with plastic film (Polymicro, etc..)
- no risk of transportation damage
- flight speed slow enough to enable balloon steering (with less risk of damage)
- this class will be very suitable for Junior World Championships (F1D-Microfilm for a Junior WC is a bad joke!)
- the class can be more easily flown concurrently with other classes like F1D-Beginner or Easy Bee
- by not excluding microfilm the class can be a step-up towards the F1D-Microfilm Master Class
- the fixed surface area and exclusion of gadgets will result in more close competition and better chances for countries with poorer flying sites
- flight times will still be significant at about 30 minutes.

Flying both the Master and the Standard Class at a world championship will lead to some problems. But by starting the competition earlier and extending the rounds into the evening and maybe flying 2 out of 5 flights this time schedule problem can be solved. More competitors will reduce the financial risk of the event.

I fully realize that this proposal will not appeal very much to the current microfilm flyers. Understandably, but consider that it is done in the interest of the future of F1D flying. When we do not act now we will soon face the situation that we cannot even find sufficient competitors or countries to hold a world championship. The average age of the current flyers is 50+ years! In several countries it is 60+ without new emerging fliers.

What do you think of this proposal? Shall we build some test models and try them in practice?

PS. The rules for the Standard Class somewhat resemble the American Intermediate Stick Class which has a max. area of 100 sq.in.. This class however forbids microfilm and it has no minimum weight. This results in very difficult to build models which weigh even less than 1 gram.

Reply from András Reé:
The future of F1D is indeed more complex (as you pointed out in your last letter) than how I wrote about it. I have to agree

with you concerning the best way of increasing indoor flying: teaching more youngsters. Besides that both you and I, and I hope others too, would like to preserve our top category indoor class.

The idea of rubber limitation time to time comes up. Originally I also was against but some things have changed my opinion. The first was a contest in Brno in 1989. Besides F1D an experimental class was flown: F1D rules plus maximum 0,75 g rubber. The rubber measurement was made after the flights in lubricated condition with O-rings, if used. After the next flight the motor was only measured when the result had improved. During the test flights we reached the 30 minutes and my son 31 minutes. In the contest the best flight was only 28 because of the bad weather conditions. The last influence was the application of 0,5 g rubber.

I suppose that the 0,5 g rubber will not necessitate the use of gadgets in Cat. III and Cat. IV sites. I can imagine to measure the rubber with or without the O-rings. If I don't want to give the advantage to others of measuring incl. the rings, I may cut them down. The TAN II rubber is for one flight only (two of my models and some others exploded with second time used TAN II).

I exclude the half or third or any partial motor flying as a competition method. For me this is a trimming and testing method. I apply half motors for that purpose frequently.

You are right of course that rubber limitation is not a solution to get more beginners. Your idea about a *Standard Class* interesting. On the contrary you must know that the acceptation of a new class for W/Ch takes a very long procedure, but that is no reason for not trying it. I think the EZB and the Beginner classes are reallly not for beginners, and I agree that F1D is a joke for junior W/Ch (as is F1C).

I agree to make demonstrations by flying experimental models according to our ideas. I plan to do this at the W/Ch if we can arrange the finances for our participation in Moscow, Idaho.

Further comment by T.A.:
In the mean time I read a remark in Ian Kaynes CIAM Report (FFn 962) which is disturbing:

"As part of a discussion of the ever-increasing number of championships, the Bureau developed a proposal for the Plenary Meeting that the minimum number of countries required for a valid senior world championship be increased from the present 5 to perhaps 10. This could impact on F1E championships and possibly also on F1D events outside of Europe."

This proposal makes organising a European Championships a risky business and also threatens the World Championships (if held outside Europe). See the following table:

Event	Place	No. of Participants	No. of Countries
1987 EC	Wroclaw, Poland	33	11
1988 WC	Johnson City, USA	33	13
1990 WC	Johnson City, USA	25	9
1991 EC	Slanic, Rumania	12	4
1992 WC	Wroclaw, Poland	36	13
1993 EC	Brno, Chechia	23	9
1994 WC	Slanic, Rumania	37	13

EAST COAST INDOOR MODELERS 1991 Lakehurst, NJ

December 23, 1995

Dear ECIM family:

First, both Kit and I wish you the happiest of holidays and a successful 1996!

This is the earliest we have ever sent a notification of membership renewal and Lakehurst dates. The reason for this is a very successful negotiation between the Navy and ECIM.

A proposal to move our activities to a yearly format was unanimously accepted. This approval will yield us 110 flying dates in Hangar 1. Basically we will begin our activities on January 6th and end on December 29th 1996.

Membership dues for 1996 will remain at $40.00 per family, and should be mailed at your earliest convenience. This will allow us to generate our 1996 membership list for the Navy's files. Checks can simply be made out to "ECIM".

I visited Hangar 1 just prior to Christmas and several improvements are taking place. The renovation of the northern wall is now air tight. All doors and cement block are in position providing new classrooms for the Navy. This should greatly reduce the drift from side to side. The sliding truck door entrance is temporarily sealed for asbestos removal in the southern wall. This area will be improved in 1996 in conjunction with the Votech School. While the truck door is impassable, the Navy is utilizing another truck door at the northeastern portion of the hangar.

With your help, I hope to incorporate several new activities in 1996. The first, short informal club meetings during our flying sessions. How would the 3rd Saturday of every month sound?

On the home front, my international travel schedule has been torrid the last few months. I anticipate the same schedule through the end of January. I will establish AMA sanctions beginning with the 27th & 28th of January. AMA sanctions will continue through December 29th.

As time permits, I will assemble your membership packets and get them to you as soon as I can. In the mean time, if your 1996 dues are paid, please enjoy this wonderful gift the Navy has provided!

Gary Underwood
East Coast Indoor Modelers
24 Kennebec Court
Bordentown NJ 08505

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INTERNET 70314.1207@COMPUSERVE.COM

FORTY MINUTE CLUB

JANUARY 1996

NAME	COUNTRY	TIME	1*	2*	YEAR	SITE
RANDOLPH, BOB	USA	55:06	X		1993	SANTA ANA
BROWN, STEVE	USA	52:46		X	1995	SANTA ANA
ASLETT, BERNARD	ENGLAND	52:22	X		1983	CARDINGTON
RICHMOND, JIM	USA	52:14	X		1979	AKRON
KOWALSKI, DICK	USA	50:41	X		1976	AKRON
DOIG, RICH	USA	50:41		X	1995	AKRON
UNDERWOOD, GARY	USA	49:51		X	1995	AKRON
BANKS, CEZAR	USA	49:47		X	1995	AKRON
ROMAK, BUD	USA	49:35		X	1991	LAKEHURST
RANDOLPH, BOB	USA	49:31		X	1995	AKRON
SLUSARCZYK, DON	USA	48:10		X	1995	AKRON
RICHMOND, JIM	USA	47:44		X	1986	CARDINGTON
BARR, LAURIE	ENGLAND	47:28		X	1982	CARDINGTON
HARLAN, RAY	USA	47:13		X	1980	AKRON
DOIG, RICH	USA	46:24	X		1983	AKRON
HUNT, BERNARD	ENGLAND	46:14		X	1995	JOHNSON CITY
LOUCKA, LARRY	USA	46:14		X	1995	AKRON
CHILTON, STAN	USA	46:10		X	1994	AKRON
RODEMSKY, ERV	USA	45:50	X		1974	SANTA ANA
RIEKE, K. H.	W. GERMANY	45:40	X		1962	CARDINGTON
GIBBS, BOB	USA	45:23		X	1995	SANTA ANA
REDLIN, CARL	USA	45:17	X		1962	CARDINGTON
ANDREWS, PETE	USA	44:59		X	1979	AKRON
MATHER, CLARENCE	USA	44:44	X		1974	SANTA ANA
BUTTY, RENE	SWITZERLAND	44:44		X	1990	LAKEHURST
ASLETT, BERNARD	ENGLAND	44:37		X	1985	CARDINGTON
HULBERT, BILL	USA	44:27		X	1994	AKRON
HACKLINGER, MAX	W. GERMANY	44:20	X		1961	CARDINGTON
NORE, PENTTI	FINLAND	44:01		X	1986	CARDINGTON
ANDRE, THEDO	NETHERLANDS	44:01		X	1986	CARDINGTON
MCGILLIVRAY, JACK	CANADA	43:59		X	1995	JOHNSON CITY
KOPECKY, ERNIE	USA	43:42	X		1963	SANTA ANA
ROBBINS, HERB	USA	43:39		X	1995	SANTA ANNA
ORSOVAI, DEZSO	HUNGARY	43:37		X	1986	CARDINGTON
KUJAWA, SYLWESTER	POLAND	43:35		X	1992	WROCLAW
CUMMINGS, FRANK	USA	43:28	X		1963	SANTA ANA
REE, ANDRAS	HUNGARY	43:27		X	1992	DEBRECEN
ATWOOD, BILL	USA	43:17	X		1963	SANTA ANA
PLOTZKE, RON	USA	42:53	X		1969	LAKEHURST
FOSTER, JOE	USA	42:44		X	1987	SANTA ANA
DE BATTY, BOB	USA	42:42		X	1994	SANTA ANA
SIEBENMANN, DIETER	SWITZERLAND	42:33		X	1986	CARDINGTON
CAILLIAU, LARRY	USA	42:29		X	1985	AKRON
DOMINA, DAN	USA	42:25		X	1979	AKRON
CANNIZZO, SAL	USA	42:20		X	1983	LAKEHURST
PYMM, DAVE	ENGLAND	42:03		X	1986	CARDINGTON
ROMAK, BUD	USA	42:01	X		1965	MOFFETT NAS
COSLICK, LARRY	USA	41:48		X	1995	AKRON
OBARSKI, DICK	USA	41:30		X	1981	AKRON
FINCH, TOM	USA	41:27	X		1963	SANTA ANA
CHAMPINE, BOB	USA	41:23	X		1963	SANTA ANA
RODEMSKY, ERV	USA	41:23		X	1979	AKRON
STOLL, ED	USA	41:21	X		1963	SANTA ANA
MANGALEA, CORNELIU	ROMANIA	41:15		X	1994	SLANIC-PRAHOVA
HOFFMAN, EARL	USA	41:13		X	1987	SANTA ANA
MATHER, CLARENCE	USA	40:54		X	1974	SANTA ANA
DRAPER, RON	ENGLAND	40:44	X		1962	CARDINGTON
BILGRI, JOE	USA	40:37	X		1965	SANTA ANA
NONAKA, S.	JAPAN	40:36		X	1978	CARDINGTON
STEVENS, DARRYL	USA	40:35		X	1986	SANTA ANA
SHEPHERD, JESSE	USA	40:33		X	1995	AKRON
BAILEY, BOB	ENGLAND	40:25		X	1987	CARDINGTON
POPA, AUREL	ROMANIA	40:21		X	1994	SLANIC-PRAHOVA
GITLOW, LEW	USA	40:15		X	1987	SANTA ANA
KALINA, JIRI	CZECH	40:11		X	1975	CARDINGTON
RODENBURG, OTTO	NETHERLANDS	40:11		X	1986	CARDINGTON
TRIOLO, JOHN	USA	40:06	X		1974	LAKEHURST

* CLASS 1 – Over 65 cm
CLASS 2 – FAI 65 cm – 1 gram

Official and unofficial flights included (best effort only, by individual, by class is shown).

For additions, corrections, etc. send details to: BOB GIBBS 22870 Springmist Drive, Moreno Valley, CA 92557 USA:5

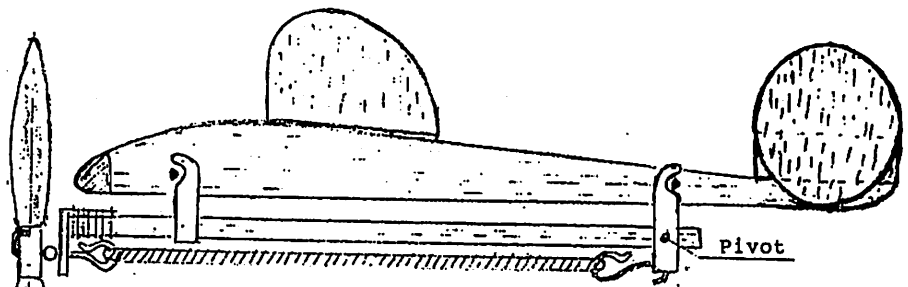
A rare "Bird" in the Nostalgia Years

by Tom Schippers (NED)

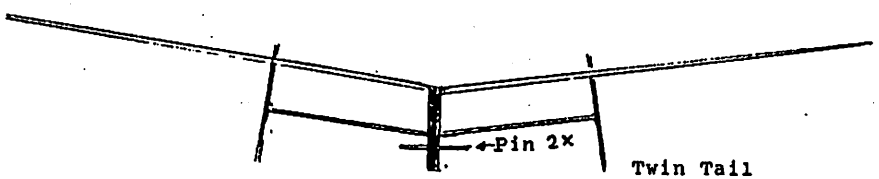
It was about a year before "Pearl Harbor"(7 december 1941), that I saw on the 2 square mile field on the western rim of Batavia (now Djakarta) a very rare "bird" amongst the models that the boys were flying that afternoon on that "model airfield".

It was an all balsa hand launch glider of about 60cm (24 in.) span, equipped with a self-detachable rubber motor (see sketch below). The motorstick clamped itself to the glider as long as there was sufficient tension in the motor. After some trimming and test glides, the combination was assembled and launched. It climbed steeply in a straight line to about 60 m (200 ft) height. Then the plane levelled out and the motorstick fell off, tumbling down to mother earth.The plane flew in a straight line to the west over a "dessa" (an Indonesian village) untill it became a dot in the sky and went out of sight.

We were all stunned by this show. I have never seen this combination since. At that time there were wide open spaces near most cities. Nowadays "that model airfield" is the Business and Hotel Centre of Djakarta (at that time it had 300.000 inhabitants, now 9 million!). How the world has changed in 55 years!



Side View of Glider with Motorstick.



Front View of Glider

Drawings not to scale.