Indoor News



Issue 25 February 1994

RECORDS, RECORDS, RECORDS .....

55'06 F1D Microfilm Cat. IV World Record
Bob Randolph (USA) December 5, 1993
Bob broke the absolute world record at Tustin (Santa Ana, California) with a great 53'48 no touch flight, but improved on that one week later with 55'06! He used his Super Cat II design and a 22/35" VP prop. The previous record was held by Jim Richmond (51'14) and the unofficial by Bernard Aslett (52'22).

45'32 F1D Microfilm Cat. II World Record
Bob Randolph (USA) October 17, 1993
Bob is most successfull in his hunt for records, but a time like this for Cat. II is just incredible. This flight actually exceeds his current Cat. III record. The flight was made at Norton AFB and he used a slightly different version of Super Cat II. The wing tips were rounded in both the front and the back. This flight was a no touch, no steer flight, four feet below the ceiling. Bob says he doesn't know how to account for this kind of time for 43 ft (13.1 m) as the weather only got to 78°F (25.6°C) and there were puddles of water on the hangar floor from a rain storm the night before.

Exhibit VI: Description of Randolph 45 Min 14 Sec Record Attempt F1D 32c (Cat. III, 15-30 m)

The weather was perfect for indoor models with a high of 97°F (36.1°C), light winds, and low humidity. The flying site was Dock 1 at Norton AFB with an arched roof and 80 ft. (24.4 m) ceiling. It's big problem was many hang down lights that extended to 53 ft. (16.2 m) in the center third of the hangar and even lower at both sides. Flights above 53 ft. required precision steering and release to avoid the four irregularly spaced lights that surround your ship but are never more than 15 ft. (4.6 m) away. At my age (70), the stress involved was close to my limit. In addition, 8-10 pieces of a huge dissembled 60 ft. C-141 field maintenance stand were stored on the hangar floor. The largest piece was 20 x 8 and 8 ft. high. Also there were 5 or 6 hang down ropes near the hangar sides.

My Super Cat II design evolved from my Cat II World Record ship. It is a stretched wing F1D with a 35" (889 mm) tapered wing. Most of the changes were made to match the power characteristics of the new Tan II rubber. The 22/34 (559/864) VP propeller is torque actuated with boron ribs and outline with adjustable high pitch and pre-load tension nylon screws.

Upon the completion of satisfactory half motor test flights, three official attempts were made. The first attempt was terminated at 12 minutes when the motor suddenly broke and dropped off. Damage to this model was sufficient that I had to go to a back up model and more tests. Half motor flights of 24:24, 21:36 and 23:05 with heights of 50, 40 and 39 ft. indicated this ship was ready. The first attempt resulted in hitting a beam and an exciting 15 ft. tail slide before recovering for a 41:19 flight. I made a different motor and a VP prop adjustment and was ready for the record flight.

I wound 2040 turns into a 13¼ x .435 x .058 inch (337 x 1.1 x 1.47 mm) motor and backed off 120 turns for a launch torque of 27. At 5:50 PM and a floor reading of 92°F (33.3°C) the model was launched. The climb was very slow taking 5 minutes to reach a 5 ft. (1.5 m) altitude. The low level drift moved it towards the NE corner of the hangar. At 12-13 minutes, the ship reached 18 ft. (5.5 m) and increased its climb rate slightly. A steer was required to move away from the corner and lower lights. The model certainly appeared to be underpowered, however to our surprise it continued its slow climb to 62 ft. (18.9 m) or about 9 ft. (2.7 m) above the lights. I estimate that

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 (I can read the latter two, but not write them). Please type your texts on 12.5 cm width. Texts can be sent on floppy disk (3½ or 5¼) in Wordperfect or ASCII format.

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Editor:
Thedo André
Meijhorst 35-43
NL-6537JD Nijmegen
The Netherlands

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it peaked at 30 minutes. Drift was low at higher levels, but two steers were made to avoid the hang down light lines. As it slowly descended drift increased and later two steers were needed to avoid the maintenance stand parts. Super Cat II was about 12 ft. (3.7 m) high when it passed the old 44:43 record and a cheer went up from all present. The ship settled in at 45:14 using all but 50 of its turns yielding an average RPM of 41.3.

Exhibit VI: Description of Randolph 45 Min 32 Sec Record Attempt F1D 32b (Cat. II, 8-15 m) (slightly edited (T.A.))

The flying site was Hangar 795 at Norton AFB, San Bernardino, California, where I retired from the USAF twenty years ago. It has a level open beamed ceiling of 47 ft. 7 in. (14.5 m) with the lights above the beams. The only physical obstructions are three ropes hanging down near the Eastern side. It had rained the day and night before and a leaky roof allowed many water puddles to remain on the hangar floor. The weather outside was partly cloudy with 10 mph winds, and the temperature inside the hangar reached a high of 78°F (25.6°C).

My Super Cat II design is almost the same as I used for the Cat III record last month. It is a stretched wing F1D with a 35 in. (889 mm) tapered wing. It has the same variable pitch propeller. It is smooth running and matches the torque characteristics of the new Tan II rubber perfectly. About 7% greater power was required than usual, because of the cooler temperature and higher humidity. I made a half motor test flight of 20:30 and decided I was ready for an official attempt, however, the observers had not yet arrived. Instead, I made an unofficial full motor test flight of 42:30, staying about 8 ft. (2.4 m) below the beams. At 3 PM the observers arrived and I was more than anxious to make an official attempt.

I carefully wound 1940 turns into a 13 x .0435 x .062 inch (311 x 1.10 x 1.57 mm) motor and backed off 60 turns for a launch torque of 35. The model was released inches from the floor and it climbed very slowly but steadily to about 40 ft. (12.2 m) of altitude. Eighteen minutes into the flight, it was down to 35 ft. (10.7 m) when the prop moved to a lower pitch and it started another slow climb peaking at 43-44 ft. (13.1-13.4 m). While it drifted around somewhat, my main concern was that the 20 or so pigeons that were flying about might collide with my model and possibly spoil a great flight. Near the 40 minute mark, the ship drifted to within 1 ft. of one of the hang down ropes, but no steering was required. The model finally settled to the hangar floor at 45:32. The turns remaining were counted and the average RPM determined to be 35.7.

Exhibit VI: Description of Randolph 55 Min 6 Sec Record Attempt F1D 32d (Cat. IV, >30 m) (slightly edited (T.A.))

It was another beautiful California day with sunny clear skys and light to calm winds. The flying site was Hangar 1 of the Marine Air Station, Tustin, Ca, formerly called Santa Ana. There is little doubt that it is probably the best Cat IV site in the world due to its size and good weather. The dirigible hangar has an open beamed arched ceiling that is 156 ft. (47.5 m) high at the center. The only obstructions were rows of helicopters parked on both sides of the hangar. This was no real problem but required some steering. While the huge main hangar doors were closed, three large entrances approximately 10 x 10 ft. (3 x 3 m) had no doors. It had been almost seven years since we last flew here except the previous week I had a record 53:48 flight and was still preparing the record claim dossier for that flight.

My "Super Cat II" design is the same as I used for the Cat II and Cat III Records in September and October. It is a stretched wing F1D with a 35 in. (889 mm) tapered wing. It has the same 22/34 in. propeller but from a lot of air time had become a 35 in. (888 mm) low pitch.

The VP prop was adjusted for less high pitch in order to climb properly without using heavier rubber. A half motor test flight of 26:28 indicated that the prop/power set up was about right. I carefully wound 2200 turns into a 14 x .0435 x .063 inch (356 x 1.10 x 1.59 mm) motor and backed off 20 turns for a launch torque of 42. At 3:50 the model was launched about 3 ft. from the floor. It climbed steadily and was just below the cat walk height at 14 minutes. I was quite concerned that it might outclimb the site and hang up, since it usually starts a second climb at about 18 minutes. My first steer was made at 19 minutes to avoid the cat walk. The model peaked out at around 32 minutes at 136 ft. (41.5 m) and centered perfectly. When the torque finally decreased and the VP prop reached its fixed low pitch position, the model started its slow descent. Another steer was made at about 48 minutes to keep it from landing on top of the helicopters. It turned out that part of the model's circle was now over our model boxes and tables, so these were quickly moved out of the way. My model finally settled to the hangar floor at 55:06 with 100 turns remaining. The average RPM was calculated to be 37.7. After the flight was completed, my good friend and former F1D World Champion Erv Rodemsky commented that I made it look too easy. Perhaps he was right.

Description of 53 Min 48 Sec Record Attempt F1D (Cat. IV) (slightly edited (T.A.))

This flight was also made at Hangar 1 of the Marine Air Station at Tustin. The weather outside was partly cloudy and the wind calm. It was cold and damp inside with a high of 69°F (20.6°C). The same "Super Cat II" design was used. A half motor test flight of 26 minutes indicated the prop/power set up was about right. My first full motor attempt was 26:45 because I broke a wing steering. Another wing (my last) was installed and more ¼ and ½ motor test flights were made. This time my half motor time was 26:46. I wound 2020 turns into a 13 x .0435 x .064 inch (311 x 1.10 x 1.63 mm) motor and backed off 20 turns for a launch torque of 44. At 3:35 PM the model was launched about 3 ft. from the floor. It seemed to climb out much faster than my other flights. It reached cat walk height (125 ft./38.1 m) in about 14 minutes. I was quite concerned that it might outclimb the site and hang up, since it usually starts a second climb at about 18 minutes. It peaked at about 32 minutes and was centered perfectly. It was inches from the beams but never touched them. My concern now was a vent in the ceiling that was offset from the center. This vent kept slowly drawing my model towards its side of the hangar. I had to steer three times to avoid the side arches and about six more times I wished I had steered because it was so close. I was quite relieved when it finally was safely just below cat walk height. At about 35 ft. (10.7 m) no turns remained and the motor could be seen sagging between the hooks. It still maintained about a 10° descent angle until 10 ft. (3 m) above the floor. The prop had wound the motor backwards and about stopped. This resulted in a steeper 40° descent. While I considered grabbing the model to avoid prop damage, the motor came off at 2 ft. terminating the flight at 53:48. Only 4 seconds of flying time was lost. The average RPM was calculated to be 37.2.

F1D 32B WORLD RECORD 45'32
INDOOR AEROMODELS CAT. II
U.S.A. NATIONAL RECORD 45'32
STICK, CAT. II

RECORD FLIGHT OCT. 17, 1993
NORTON AIR FORCE BASE
SAN BERNARDINO, CA.
CEILING 47 FT. 7 IN. (14.5 m)

WEIGHTS	OZ	GRAMS
WING	.0133	.38
PROPELLER	.0100	.28
REMAINDER	.0196	.56
	.0429	1.22

PROPELLER (VAR. PITCH)
22.0" (559) DIAMETER
34.0" (863) PITCH

RUBBER MOTOR
13.0" (311) LOOP
.062" (1.57) WIDTH
.0435" (1.10) THICKNESS
.045 (1.28) WEIGHT
1880 LAUNCH TURNS

58% CG

F1D 32c WORLD RECORD 45'14
INDOOR AEROMODELS CAT. III
U.S.A. NATIONAL RECORD 45'14
STICK, CAT. III

RECORD FLIGHT SEPT. 26, 1993
NORTON AIR FORCE BASE
SAN BERNARDINO, CA.
CEILING 80 FT. (24 m)

WEIGHTS	OZ	GRAMS
WING	.0133	.38
PROPELLER	.0100	.28
REMAINDER	.0194	.55
	.0427	1.21

PROPELLER (VAR. PITCH)
22.0" (559) DIAMETER
34.0" (863) PITCH

RUBBER MOTOR
13.25" (336) LOOP
.058" (1.47) WIDTH
.0435" (1.10) THICKNESS
.042 (1.19) WEIGHT
1920 LAUNCH TURNS

58% CG

F1D 32d WORLD RECORD 55'06
INDOOR AEROMODELS CAT. IV
U.S.A. NATIONAL RECORD 55'06
STICK, CAT. IV

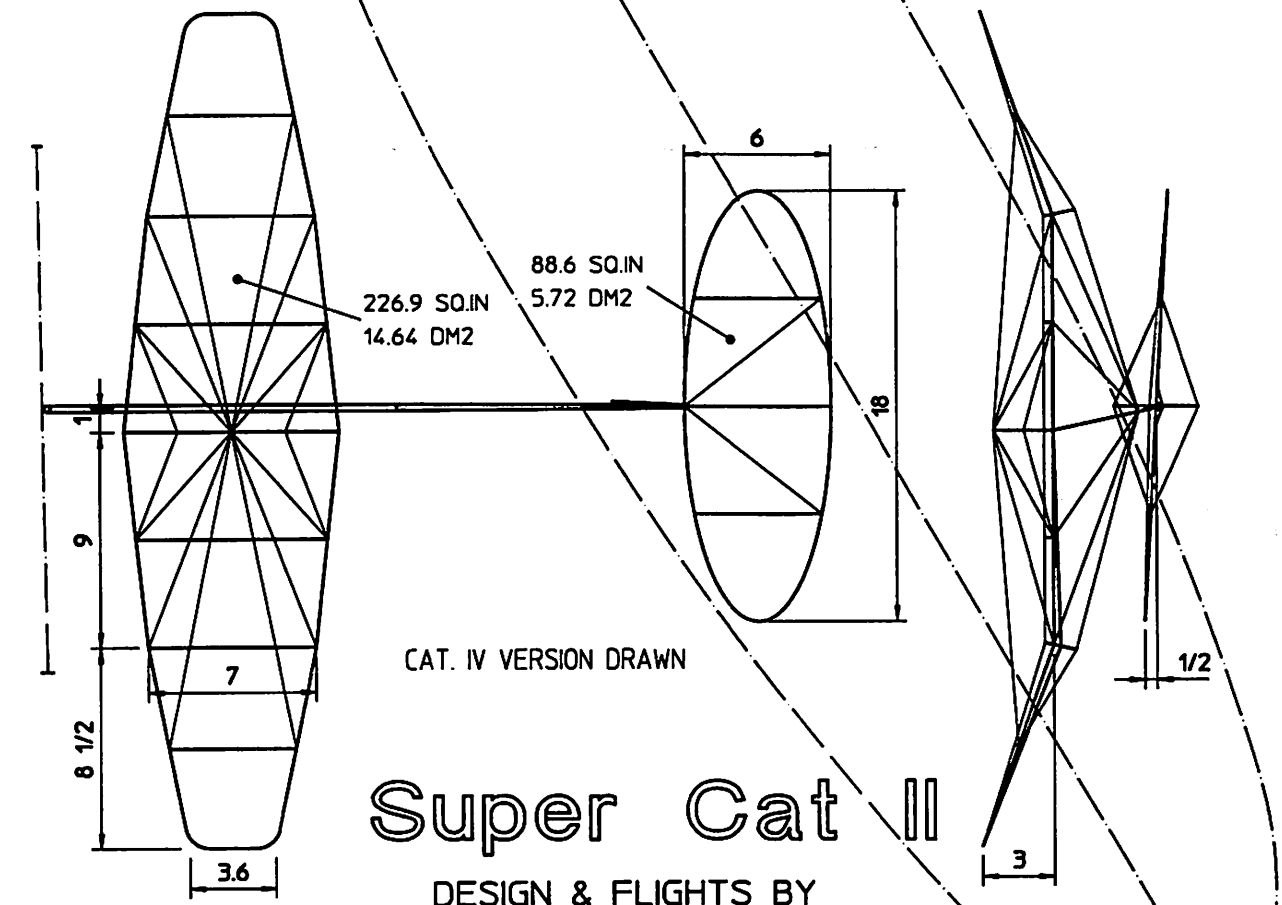
RECORD FLIGHT DEC. 5, 1993
MARINE CORPS AIR STATION
TUSTIN, CA.
CEILING 156 FT. (47.5 m)

WEIGHTS	OZ	GRAMS
WING	.0123	.35
PROPELLER	.0100	.28
REMAINDER	.0190	.54
	.0413	1.17

PROPELLER (VAR. PITCH)
22.0" (559) DIAMETER
35.0" (888) PITCH

RUBBER MOTOR
14" (356) LOOP
.063" (1.59) WIDTH
.0435" (1.10) THICKNESS
.0485 (1.38) WEIGHT
2180 LAUNCH TURNS

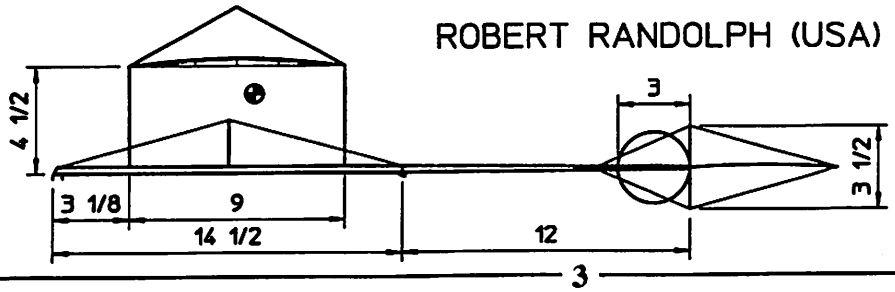
56% CG



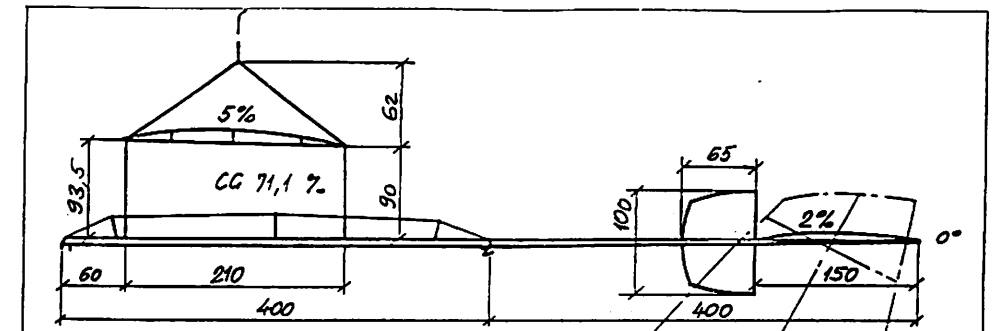
CAT. IV VERSION DRAWN

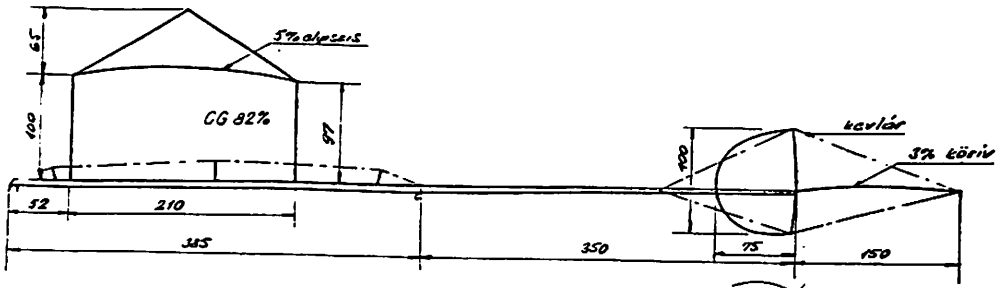
Super Cat II

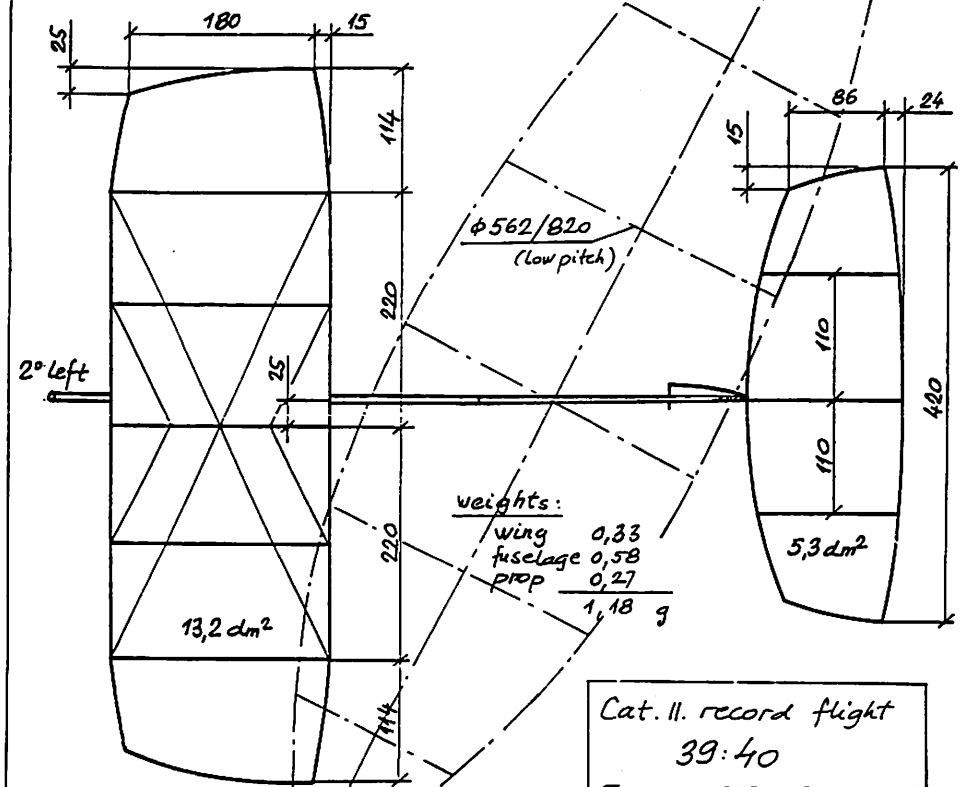
DESIGN & FLIGHTS BY
ROBERT RANDOLPH (USA)



Drawn: R.Randolph/T.André



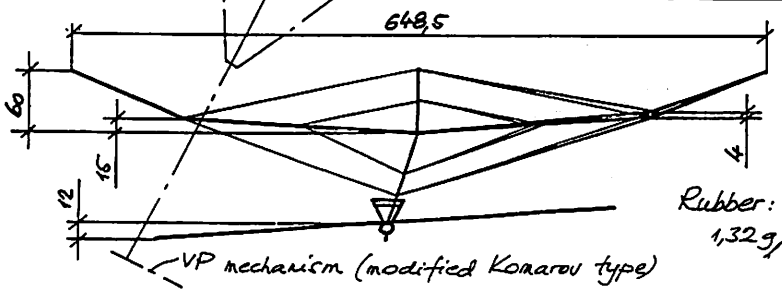




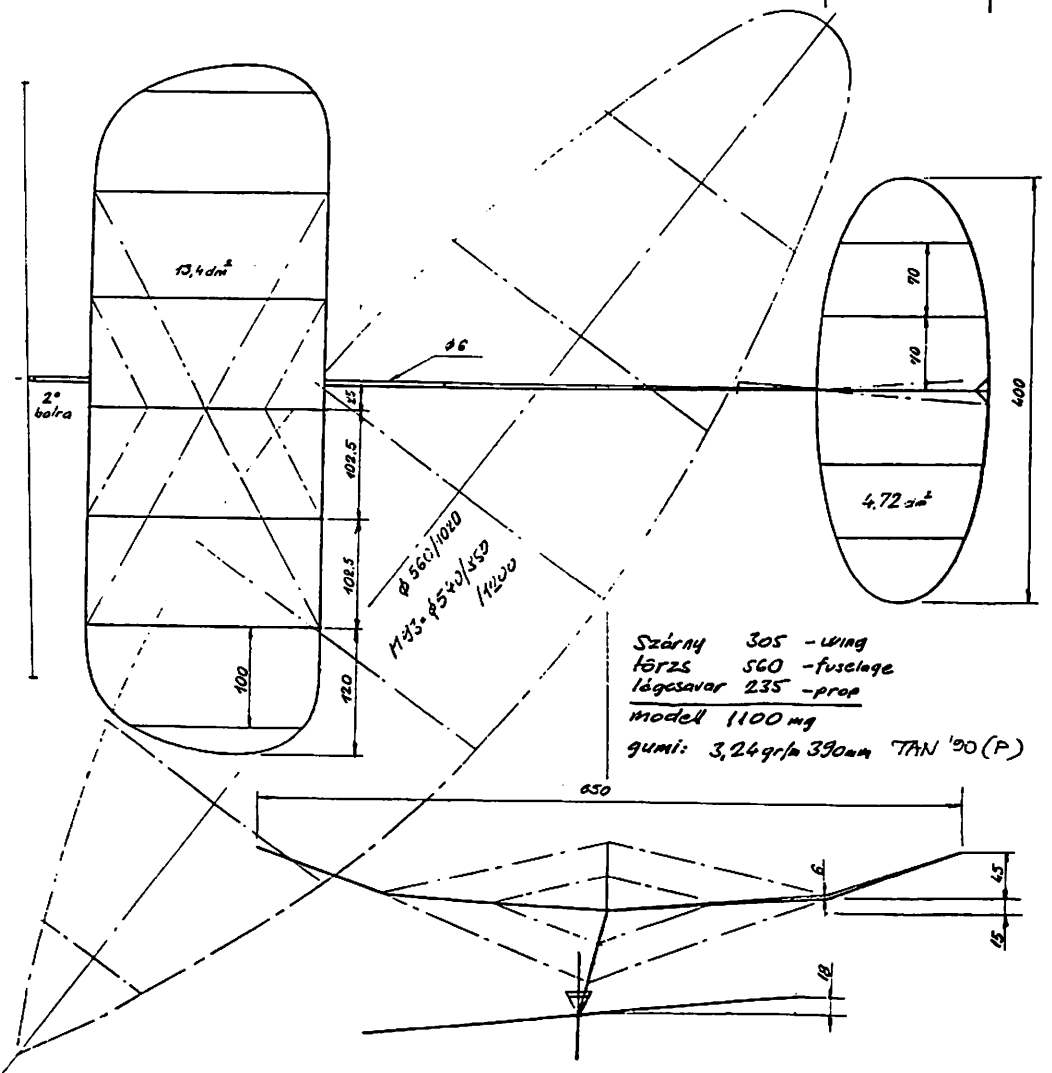
weights:

wing	0,33
fuselage	0,58
prop	0,27
	1,18 g

Cat. II. record flight
39:40
June 20, 1993, Budapest



Rubber: Pirelli ('82)
1,32 g/430 mm



Szárny 305 - wing
törzs 560 - fuselage
légcsavar 235 - prop
model 1100 mg
gumi: 3,24 gr/m 390mm TAN '90 (P)

1:5	INDOOREE '92	A. REÉ Hungary

M 93 ORSOVAI DEZSÖ
HUNGARY

BUDAPESTI MÜSZAKI EGYETEM
1993.06.20. 38:54 Cat II World Record

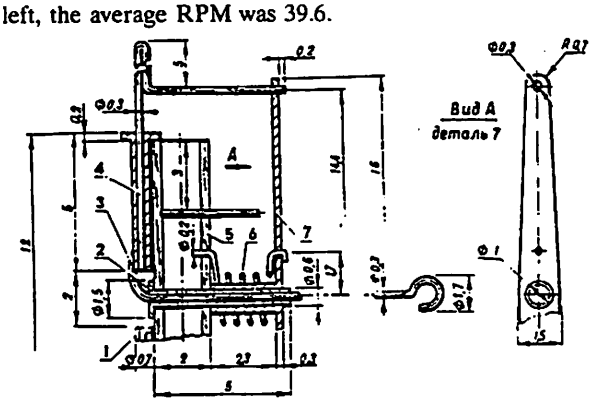
Hungarian Cat II World Records

Reported by Andras Reé (HUN)

As reported in IN23 two F1D Cat. II world records were flown during the Várszegi Memorial indoor contest in Budapest. By now we have got the official confirmation for both records from the FAI Bureau. The site of the record flights was the hall of the central "K" building of the Technical University Budapest, the place of three previous Cat. II indoor world records flown in 1970 (Reé), 1981 (Orsovai) and 1991 (Reé). The certified official height of the hall is 14.90 m, which also equals the maximum height of the hall. The ceiling is flat, glass covered.

On the first contest day - as an opening of this very successful contest - in the first round I flew a Hungarian Cat. II record with 37:11, just 1 second below the existing world record of Bob Randolph. On June 20, 1993 (second day of the competition, sixth round) at 11.15 AM Deszö Orsovai launched his M-93 model (see drawing). During the previous flights he succeeded to adjust the VP mechanism of his prop and it worked well. After about 3 minutes climbing the model reached the ceiling and at about 8.5 minutes it started to descend very slowly down to 12 m at 17 minutes, and levelled at 24 minutes. Then the descending continued again very slowly. It was necessary to make a few slight steerings between 9 and 7 meter flying height with a pole. After landing the recorded time was **38 min. 54 sec.**, a new Cat. II world record in class 32-b (exceeding the previous 37:12 by Bob Randolph by 1:42). The rubber motor was made from a batch of Tan (1990), it weighed 1.27 grams, the original length was 390 mm, and that was the fourth flight with this motor (first on that day). He succeeded to wind 1920 turns into the rubber and launched with 1770 turns. After landing 100 turns remained, the average RPM was 42.9.

About 2.5 hours later at 2.28 PM I launched my VP prop driven INDOOREE '92 model (also see drawing). After about 3 minutes climbing the model reached the ceiling. At 12 minutes it started to descend. The height was about 8 m and the time about 24 minutes when the second climb started because of the variable pitch prop (low pitch 820 mm). At about 30 minutes the second descend started at 11 m height. It needed some slight steerings between 9 and 6 meter flying height with a pole, after which the model landed smoothly. The recorded time was **39 min. 40 sec.**, which exceeded the brand new record of Orsovai by 46 seconds. The rubber motor was made from a batch of 1x4 mm Pirelli from 1982 (the same that I used at my 35:43 Cat. II world record in 1991). The rubber weighed 1.32 grams, the original length was 430 mm and it was the second flight with this motor (the first also on the same day). I succeeded to wind 1840 turns into the motor and I launched with 1700 turns. After landing 130 turns were left, the average RPM was 39.6.

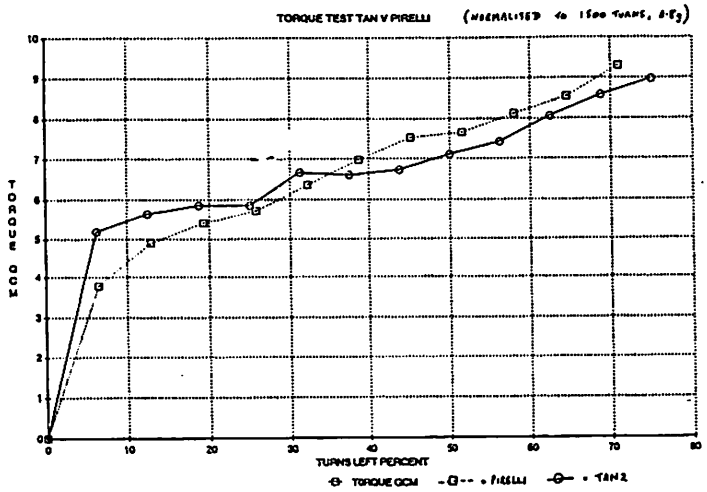


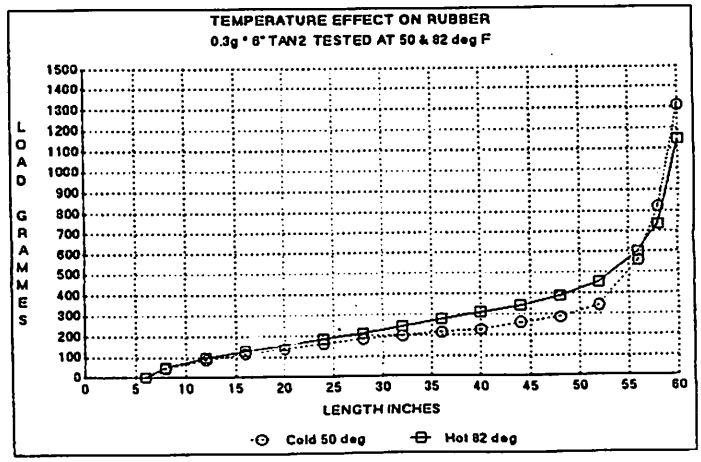
On both record models we used modified Komarov type VP mechanisms (see sketch of Komarovs original version from Vol Libre, which was originally published in a Russian paper in 1991). The temperature in the hall was 26°C (outside about 30°C, sunny) and the humidity was 59% with small drift between about 6 and 10 meters height, so the conditions were good.

TESTS OF TAN II

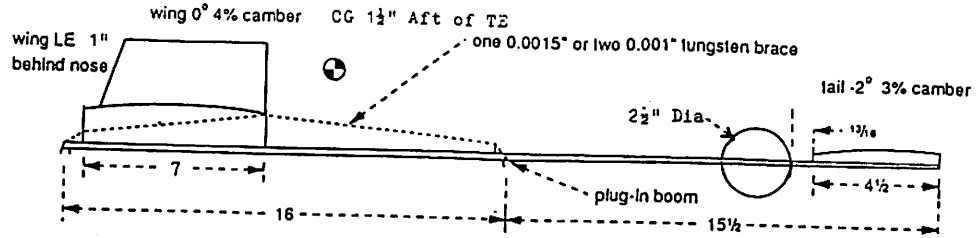
by Bernard Hunt (GB)

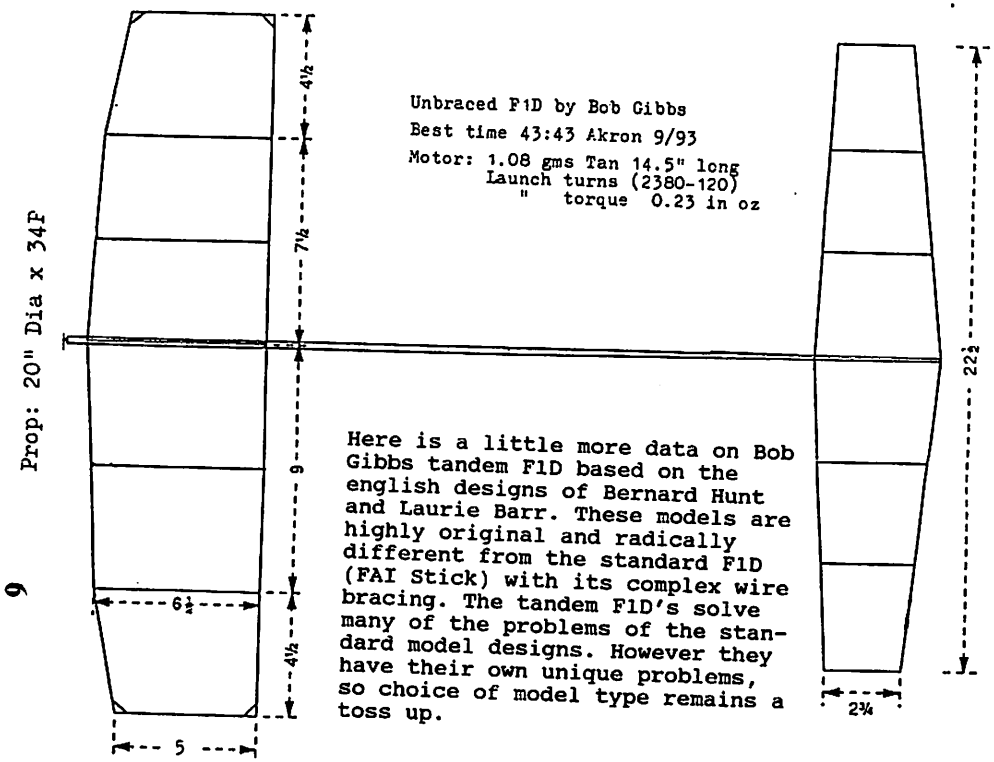
I have tested Tan II rubber by stretch and winding methods and found it to be good for energy but rather tricky to handle (breaking at knot) - some batches are worse than others. The torque curve is definitely flatter than Tan I or Pirelli. This can probably be explained by the shorter loop lengths arising from the high stretch ratio - effectively the loop is tighter between the hooks at low turns.





EFFECT OF TEMPERATURE I have been surprised by the ease of winding and good energy of Tan II at low temperatures. I did some stretch tests at two extreme temperatures (for UK indoor fliers!). The specific energy was 119,000 cm (3900') at 50°F (10°C) and 132,000 cm (4300') at 82°F (27,8°C) - both excellent figures. Despite the 12% extra energy and 25% extra cruise torque at 82°, the rubber was definitely more fragile - I broke 3 motors in doing the single test and failed to reach my normal maximum load.





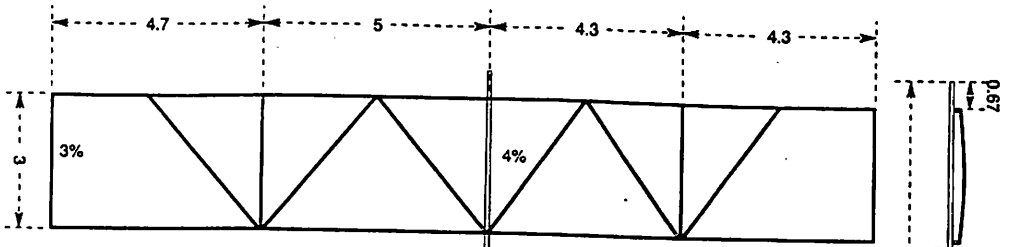
Unbraced F1D by Bob Gibbs
Best time 43:43 Akron 9/93
Motor: 1.08 gms Tan 14.5" long
Launch turns (2380-120)
" torque 0.23 in oz

Here is a little more data on Bob Gibbs tandem F1D based on the english designs of Bernard Hunt and Laurie Barr. These models are highly original and radically different from the standard F1D (FAI Stick) with its complex wire bracing. The tandem F1D's solve many of the problems of the standard model designs. However they have their own unique problems, so choice of model type remains a toss up.

---------FAI INDOOR TEAM SELECTION FINALS -- LORAL AIRDOCK, AKRON OHIO -- SEPT 4 - 6, 1993---------

CONTESTANT	ROUND 1	ROUND 2	ROUND 3	ROUND 4	ROUND 5	ROUND 6	ROUND 7	ROUND 8	ROUND 9
Steve Brown	-	00:22:16	00:48:37	-	00:47:54	-	-	00:45:40	-
Bob Randolph	00:12:56	00:43:19	00:45:35	-	-	00:42:00	-	-	-
Cezar Banks	00:38:17	00:01:42	00:41:34	00:43:04	00:45:01	00:45:57	-	00:27:49	-
Bob Gibbs	-	00:39:26	00:32:39	00:38:41	att	-	00:10:30	00:43:43	00:36:51
Larry Loucka	-	-	00:41:20	-	-	00:34:13	00:38:35	att	00:01:09
Rich Doig	-	00:35:06	00:32:23	00:35:27	00:39:59	00:38:50	00:39:49	00:25:27	-
Gary Underwood	00:26:06	00:30:53	00:35:44	00:38:39	00:26:43	00:32:55	00:29:08	00:35:54	00:37:57
Don Slusarczyk	00:36:28	00:34:12	00:34:24	00:36:02	00:35:36	00:08:56	00:33:23	00:38:49	00:31:01
Bill Hulbert	00:27:34	00:27:30	00:33:13	00:35:32	00:28:25	00:36:28	00:29:57	00:30:19	00:27:30
Tom Vallee	-	00:11:57	00:28:47	00:29:18	00:32:52	00:33:45	00:15:42	00:26:11	00:26:54
Dan Beljeff	00:23:00	-	00:20:22	00:28:45	-	00:34:51	-	00:26:13	00:02:48
Larry Mzik	00:27:31	00:31:27	00:30:15	00:24:47	00:29:19	00:31:56	00:12:01	00:33:20	00:23:14
George Chabot	00:31:40	00:29:18	00:32:01	-	00:28:01	00:28:09	-	-	-
Chuck Slusarczyk	att	-	00:34:01	-	00:29:14	-	-	-	-

CONTESTANT	BEST FLIGHT	2ND FLIGHT	TOTAL (Best 2)	FINAL PLACE	FINALS POINTS	REGIONAL POINTS	TOTAL POINTS	TEAM PLACE
Steve Brown	00:48:37	00:47:54	01:36:31	1	1000.00	100.00	1100.00	1
Bob Randolph	00:45:35	00:43:19	01:28:54	2	921.08	100.00	1021.08	2
Cezar Banks	00:45:57	00:45:01	01:30:58	3	942.50	75.00	1017.50	3



Wing spars 4.8 lb/cu ft cut from 0.035 sheet, 0.080 at root, taper to 0.055 at dihedral break and 0.020 at tip.
Wing ribs 0.030 deep from 0.020 sheet. No centre rib.
Tip is 0.030 x 0.020 flat. Centre panels flat; 1.5° tip dihedral both tips, both tip panels have slight washin.

Wing set at zero incidence on ⅜ long posts which are glued to motorstick
Wing has tissue tubes front and rear.
Tailplane on similar mounting.
Prop shaft 4° upthrust and 2° left thrust in 0.012" wire pig tail bearings.
CG 1.5" behind wing TE.

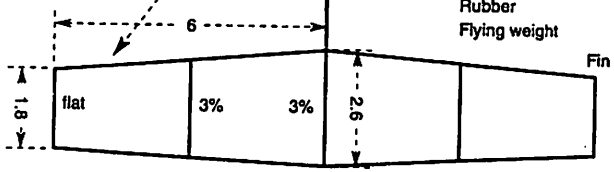
0.012" wire hook

Motorstick 4.8 lb/cu ft balsa 9" long
0.174 x 0.77 nose
-> 0.214 x 0.095 centre
-> 0.195 x 0.069 rear
Tailboom 4½ lb/cu ft balsa 11.5" long
0.080" sq taper to 0.063 x 0.044

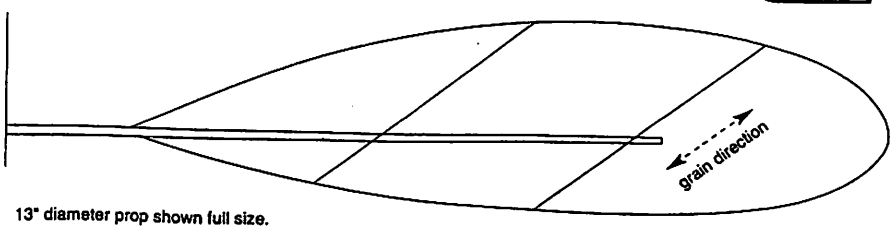
Cover with Polymicro mylar, available from Wayne Trivin & Lou Gittlow. Use 3M spray adhesive, sprayed into a small container and diluted with lighter fluid until like water. Apply sparingly with a fine brush. Allow to dry. Mount Polymicro on over-size frame. Place wing upside down and using a fine brush and lighter fluid re-activate the adhesive.

WEIGHTS	gm
motorstick	0.24
tailboom	0.11
tailplane	0.06
wing	0.20
prop	0.18
Total airframe	0.79
Rubber	0.90
Flying weight	1.69

Tailplane spars 4 lb/cu ft cut from 0.024 sheet taper from 0.045 at root to 0.024 at tip.
Ribs 0.030 x 0.020. No centre rib.
¼" tail tilt for turn, also washin this panel.



Fin outline 0.024 sq



13" diameter prop shown full size.
Blades moulded on block 22.5° pitch.
Rotate to 26° pitch at 5" radius when attached to spar.
Blades are 0.008" C-grain 4½ lb/cu ft. Spar is 5 lb/cu ft, 7/16 dia taper to 1/32. Spar is underneath blade.

USA rules EZB
by Bernard Hunt
Unofficial world record time 28.33

FFn Scale 1:3 All dimensions ins

from Free Flight News
(with thanks):

BERNARD HUNT'S RECORD BREAKING EZB

Laurie Barr writes: "In June a remarkable sequence of events took place in the world of aeromodelling.

On Wednesday evening the 16th of June, Bernard rang me sounding enthusiastic about the question he had asked his computer about what duration one could expect from a USA rules EZB model that weighed in the region of 0.75 grams? It came up with the answer 28 minutes!

He then asked his program about where the centre of gravity should be, and concluded that the most practical way to achieve the design objectives was to shorten the motor stick to 9". The centre of gravity still needed to be well aft of the wing, so in order to make a long thin tail boom practical, a lower aspect ratio and much lighter tailplane was called for.

By the following Sunday, four days later, Bernard had built the model, and had made a flight of 28 mins 33 sec duration, passing his previous record by more than 2.5 mins!

Everything else was pared down close to the limit, and it was not known if such a model would hold together when full scale turns and stress was applied to it. The model uses Bernard's usual system of posts on the motor stick and tailboom plugging into tissue tube posts on the wing and tail. The tailplane incidence is adjusted during low power trimming flights - usually adding small amounts of negative incidence until model has a nose-up cruise attitude without mushing.

The record flight was made on June 20th in Number One Hangar at Cardington and the weather was not exceptional. The model gained about 135ft under the 150ft roof. 2000 turns were applied to the 0.9 gram 17.5" loop of Pirelli; 90 turns were backed off and the model landed with 180 turns left.

The model as drawn on a really good day (hot and still) in Cardington may climb all the way to the roof (another 15ft) and then fly off those remaining turns. Also a Mark II version (even lighter!) has been built by Bernard and I and 30 minutes is now within range.

Bernard is a rare aeromodeller, who has great inventive skills, and has compiled computer "models" for all kinds of indoor duration types that provide near perfect answers to the question he asks it. I know there are others who do this, but Bernard's strength lie in his excellent model building skills, allied to a fierce competitive edge, yet strangely he gives all his secrets away so easily and is keen to share his knowledge with fellow enthusiasts. A similar prediction of 38 minutes was made for the American Intermediate Stick class and was fulfilled in flight at Johnson City this year.

Last year he developed a design of an F1D class microfilm model that needs no complex and difficult wire bracing. The new style models to his design are now within reach of modest building skills, and they are very strong, fly like a dream, and pack in to small boxes for easy travel, and are capable of world class times. Another remarkable achievement.

RUBBER MOTOR SELECTION FOR LRS MODELS

KAI K. HALSAS

I had a lot of problems when flying my first (overweight) LRS models. With low torque the planes flew relatively well, but with higher torque they either crabbed sharply to the left and dived into ground or tried to fly as some kind of parlorcopter.
My first motors weighted about 80% of the airframe weight. The rubber unit weight was close to 1.o g/m and the torque almost 0.4 oz.in. The rubber weight of 0.5 g gave a wing load of 1.o g per square decim.

Table No 1 shows how I gradually went to lighter motors.
With my overweight planes I feel that the rubber motor parameters are:

Rubber weight, 50-60% of airframe:	0.3-0.36 g
Rubber unit weight:	0.6-0.65 g/m
Wing load:	1.1 g/sq.dm.
Torque:	Max. 0.2 oz.in.

At the present time I can not continue testing with different motors, or new lighter planes. Next winter I hope to be able to resume test flights.
I have also collected information from some Free Flight newsletters. This information is shown in Table No 2.
I am proposing now the following parameters for LRS motors, as a starting point for testing. These are for models which are built close to the min. weight of : 0.425 g.

Low ceiling flying

Wing load:	0.55-0.6 g/sq.dm.
Rubber weight, less than 60% of airfr.:	0.25 g
Rubber unit weight:	0.5 g/m
Torque:	0.1-0.13 oz.in.

High ceiling flying.

Wing load:	0.8 g/sq.dm.
Rubber weight, Max. 100% of airfr.:	0.425 g
Rubber unit weight:	0.5-0.65 g/m
Torque:	0.15-0.2 oz.in.

The reader will note that I have used the unit weight g/m to show rubber size.
I do not have measuring equipment to measure the width of rubber motors accurately.
The unit weight can be measured accurately with the Indoor Scale.

	Model Weight g	Rubber Weight g	Wing Area dm2	Wing Load g/dm2	Loop mm	Rubber g/m	Calc. Turns	Calc. OZ.IN Torq.	REM
KKH I	0.6	0.5	1.08	1.02	250	0.94	1370	0.37	Too strong
KKH II	0.6	0.49	1.08	1.0	302	0.81	1840	0.27	Too strong
KKH III	0.6	0.49	1.08	1.0	290	0.84	1730	0.28	Too strong
KKH IV	0.6	0.25	1.08	0.79	250	0.5	1940	0.13	Too weak
KKH V	0.6	0.35	1.08	0.88	270	0.65	1840	0.19	Adeq.
KKH VI	0.6	0.33	1.08	0.86	250	0.65	1685	0.2	Adeq.

Table No 1

	Model Weight g	Rubber Weight g	Wing Area dm2	Wing Load g/dm2	Loop mm	Rubber g/m	Rubber %	Calc. Turns	Calc. OZ.IN. Torq.
Nonaka	0.432	0.17	1.13	0.53	200	0.425	39	1680	0.1
Kinoshta	0.432	0.22	1.09	0.60	200	0.55	51	1500	0.15
J. O'Donn.	0.425	0.34	1.15	0.66	330	0.51	80	2520	0.13
S. Fink	0.48	0.35	1.13	0.83	305	0.57	73	2205	0.16
J.G. Troiola	0.425	0.37	1.1	0.72	356	0.52	87	2705	0.14
T. Valiee	0.432	0.432	1.1	0.79			100		
L.Barr	0.425	0.52	1.086	0.87	305	0.85	122	1810	0.29

Table No 2

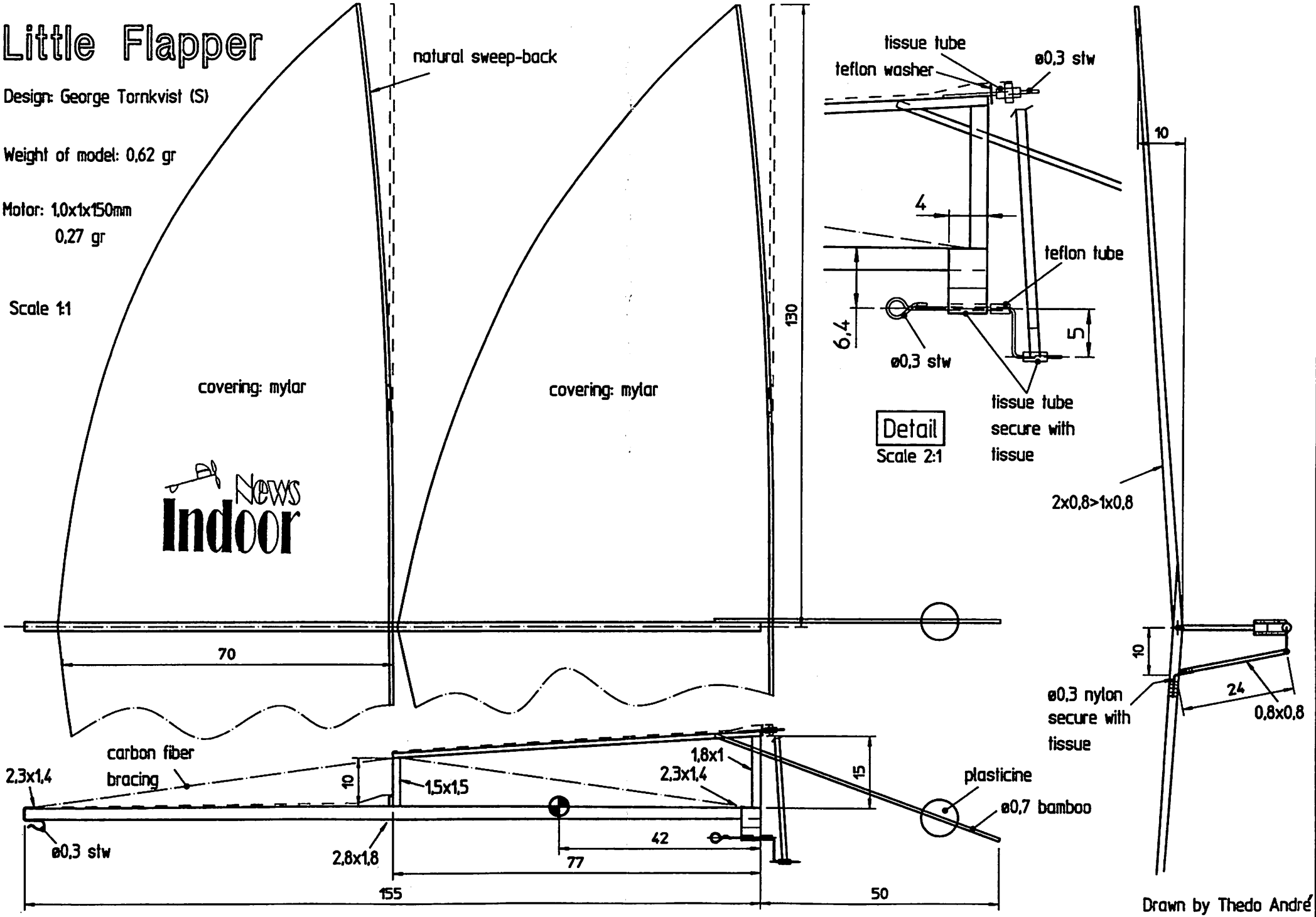
Little Flapper

Design: George Tornkvist (S)

Weight of model: 0,62 gr

Motor: 1,0x1x150mm
0,27 gr

Scale 1:1



Drawn by Thedo André

LITTLE FLAPPER

by Georg Tornkvist (Sweden)

As you see this little flapper is extremely simple. It is only meant for living room fun flying. It has made about 2 minutes in a large hall. All our friends find it very funny when it flaps around them.

There has to be a little dihedral in both wings and rather much incidence in the front wing. I have not used any sophisticated formulae or building methods, just rules of thumb and inspiration. I am sure it can be refined if one goes in for it, but I won't.

The leading edges are swept back a little, but that's not intentional. It got that way when I tried to stretch the mylar. The linkage can not take more torque than this motor gives. When it flies you see the principle very clearly. The reaction force makes the aft wing move in opposite direction to the front wing. You can also see that the beat angle is divided between the wings, which I guess makes it very inefficient. If you cut off the wing halves on one side you can make it turn to that side.

Have fun with it!!

Note from T.A.: Georg says that he is not very good at drawing and he dicided to send the complete model to me! Well, I have had a lot of fun with it. The model was entered in our yearly club contest, the Butterfly Meeting. We hold a special event, which is called "Uurtje Apart". That means something like "hour for the unusual" or "hour for weird models". You can enter any kind of model that differs from normal indoor models or standard classes. A jury consisting of non-indoor flyers selects the model that appeals most to them. There are no rules, the jury is free to choose a winner for whatever reasons they like. One or two flights have to be made. Well, Georg's Little Flapper won! The jury called his model a perfect example of the simplest possible, yet effective design.

Two weeks later I flew the model in front of ±700 people....:

INDOOR FLIGHT SHOW

This autumn in Holland a competition for paper airplanes was held at all schools for children of 13 years old. The competition was part of program to stimulate interest in engineering and science. The finale of the competition was held at a Marine Air base. The dutch indoor flyers were invited to give demonstrations. We put up a show of about 15 min. in which we flew all types of indoor models, several mass launches and unusual models like ornithopters and helicopters. We got much applauding, it was a big success!

We flew the following program:

1. Mass launch of simple parlor copters by 20 juniors.
2. Three people flying hand launch gliders (Coot-type, dyed in bright colours).
3. Mass launch of Moustique and other F1D-Beginner models.
4. All types of scale models (in quick succession).
5. Simultaneous launch of two large foam scale airline gliders (from the grandstands into the hall).
6. Unusual models like an Ackus Penni helicopter, Pistachio's, Living Room Stick, George Tornkvist's flapper and a mass launch of small catapult gliders by the juniors.
7. Mass launch of 15 Sainte Formule models.
8. Closing piece: a CO_2-powered folded paper airplane!

The show went very smoothly. We practiced two times before. A fairly strict discipline was required, but all 35 flyers involved co-operated very well. Thanks again, all of you! All in all about 700 people watched the show. We hope to make good use of the contacts we made with teachers and education authorities. Indoor modelling in particular is very suitable for school projects.

Making Scale Model Airplanes Fly

by Bill McCombs (USA)

The tables on the next pages are compiled by Bill McCombs (USA). He is the writer of the book "Making Scale Model Airplanes Fly". In clear language Bill explains all the basic aerodynamics you need to know for trimming a scale model. Scale models probably are the most difficult free flying models to trim, so duration flyers and others will also find much valuable information in this book. Besides aerodynamics Bill also gives design and selection guides in order to get the best flying model. A major part of the book covers building and construction methods. It concludes with references and lists of plans. There are three Peanut plans. Purchase data are on the next pages.

A SUMMARY OF FREE-FLIGHT MODEL TROUBLES

"Nothing promotes Free Flight like highly successful models"

With sources for recognizing, understanding and correcting them

There are many types of troubles which cause FF models to have a reduced duration capability or to fly poorly or to suffer crashes. Following is a summary of these as related to the model's components. References 1 and 2 discuss the various troubles in detail and show how to recognize and eliminate them, or prevent their occurrence in the first place. Any modeler who is not unusually expert with all types of models will benefit greatly with this information, since it will enable him to have much more fun and success for either sport or contest flying. It also enables anyone to avoid most of those discouraging, frustrating, time-consuming and expensive "learning experiences" while getting his models adjusted for best flying. Ref. 1 has been widely recommended for many years in the model magazines and FF model club newsletters.

1. Fore-and-aft C.G. ("Balance Point") Location: Either too forward or too aft is bad and can cause numerous troubles
   a) Excessive loss of altitude following a stall
   b) Large downthrust to prevent mushing or stalling or looping in powered flight
   c) Flight very sensitive to propshaft or stab incidence settings (or to small warps)
   d) Or, flight very insensitive to the above
   e) A lesser duration capability in gusty air
   f) An inability to be trimmed for a slow glide
   g) More wing warping needed for tight circling
   h) A poor flight or a crash for helicopter or for airplane models
   i) How to find the best C.G. by formula or flying
   j) Why the C.G. should not be changed for trimming

2. Power Setting Effects: Changing this setting from low to high power can cause several troubles
   a) Too steep a climb, causing stalling or looping
   b) Too shallow a climb or even a dive and a crash
   c) Excessive banking and turning or a spiral dive
   d) Excessive tail-swinging (Dutch roll) which can be violent, causing a tailspin and a crash
   e) For indoor models too large, too small, too long or too short a motor reduces duration capability
   f) High-powered rubber models often fly well under low to moderate power but go into a power-wasting turn during the initial power burst (untrimmable)
   g) Initial flights of (new) gas duration models need special consideration to avoid troubles

   c) Effects of prop size on the 3 stabilities
   d) Determining a reasonable size and pitch
   e) Too many blades are harmful for duration
   f) 3-bladed props and construction
   g) Carving and forming props and prop blades (9 ways)
   h) Advantages of tractor (up-front) props
   i) Disadvantages of pusher (rear) props
   j) Prop blade airfoil sections
   k) Helicopter rotors (indoor and outdoor)
   l) Indoor model props and ceiling height requirements
   m) Prop size must be matched to engine or motor size
   n) Items frequently wrongly blamed for troubles include torque and gyroscopic effects

8. Rubber Motors
   a) Proper break-in
   b) proper lubrication
   c) proper care and storage
   d) Proper winding (stretch-winding)
   e) Checking quality (poor rubber hurts duration)
   f) Tests to determine failing turns and torque
   g) Predicting allowable turns and torque

9. Pusher Models
   a) Why these can't steadily climb as steeply as tractor models can (so duration suffers)
   b) How to improve a pusher model's climb
   c) Differences between pusher and tractor models
   d) Carving or forming pusher model props and blades

10. Tailless Models (Flying Wings)
   a) Avoiding or correcting stability troubles
   b) Trimming arrangements
   c) Proper C.G. location
   d) Why conventional models are better than these

11. Canard Models
   a) Proper C.G. location
   b) Reasonable tail size, Tail Volume Coefficient
   c) Dihedral considerations

12. Helicopters
   a) Inability to fly upward, how to correct
   b) Wobbling flight, how to correct
   c) Effects of improper C.G. location
   d) Helicopter rotors, indoors and outdoors
   e) Highly-efficient helicopters (outdoors)
   f) Indoor helicopter arrangements

13. Airfoils
   a) Good and bad features
   b) Suggested airfoils for various types of models

postage to Europe: Airmail $4.00; Surface mail $0.40

3. Stability (3 types, longitudinal, spiral and oscillatory or Dutch-roll)
a)Instability of any of these will cause a crash
b)Too little stability makes the model too sensitive to small trim changes (and warps) and can reduce the duration capability
c)Too much stability makes the model too insensitive to small trim changes, reduces duration capability
d)Many things affect each type of stability
e) Trim and stability are different things, why trim changes cannot eliminate stability-caused troubles

4. Wing Dihedral
a)Why it is needed and what it does
b)Too much or too little can promote several troubles including spiral instability, Dutch roll and a reduced duration capability
c)"Effective" Dihedral is provided by things other than wing dihedral and is easily estimated
d)Determining reasonable amounts for different models
e)How to compare the different types of dihedral to V-dihedral, i.e. their "equivalent V-dihedral"
f)Adequate minimum dihedral for scale models can be determined by certain simple glide tests

5.Vertical Tail Size: The item least understood by most modelers; too large or small causes troubles
a)Spiral instability, trim changes won't correct
b)Severe Dutch roll, trim changes won't correct
c)Flight too sensitive to small trim changes, warps
d)Flight too insensitive to trim changes
e)Wandering flight (change in direction)
f)Reasonable sizes can be determined before flying
g)Reasonable sizes can be checked by glide tests
h)Reasonable sizes indicated by flight tests
i)How to recognize troubles in flight
j)Can't maintain a steep climb, always veers-off in an undesired spiral which cannot be trimmed away (also 2f above)

6.Horizontal Tail
a)Calculating and using the Tail Volume Coefficient
b)Improper size causes a loss in duration capability
c)Determining a reasonable size
d)When a so-called "lifting tail" (a cambered airfoil) should and should not be used
e) When a negative camber ("upside down") airfoil should be used
f)Good and bad effects of tail dihedral (V-tails)

7.Propellers
a)Too large a prop or pitch can cause troubles
b)Too small a prop or pitch can cause trouble
c)Taut tissue "sag"
14.Bad Trim (Including warps)

The above subjects for, both, nonscale and scale models are discussed in the following references. Ref. 1 also discusses construction, biplanes and provides numerous sources for articles, plans, kits.

Ref.1 "Making Scale Model Airplanes Fly" (revised 1992), $14.95 ppd USA,* William McCombs (Aircraft Data), Box 763576, Dallas, TX 75224

Ref.2 "Vertical Tail Size for Models", a reprint of the Mar-April, '92 article in Model Aviation but with corrections and added comments: discusses mainly the turning and banking flight. but has some data not in Ref.1. $2.95** with a 2-stamp SASE (No SASE if ordered with Ref.1). U.S.A only

We have received hundreds of letters over the years from modelers who were surprised and delighted to learn how easily the various types of models could be made to fly well, for sport or contest purposes.

Perhaps surprisingly, most modelers do not know how to deal best with various types of kites, which can sometimes be embarrassing if asked for help. After all, kites can be fun as "things that fly", and during the tow a towline glider is just a glorified kite. Our article "About Those Kites" has all that one needs to know to easily make any type of kite fly at its best. For example, the line to bridle attach point location and a rear fin (never a draggy cloth tail) are two key items. Available for $2.95** and a 2-stamp SASE from the above address (SASE not needed if ordered with Ref.1) U.S.A only

(like airplanes kites also suffer from bad trim and stability troubles, and the article discusses these)

Also available are the following "Peanut" plans, more may be available later.

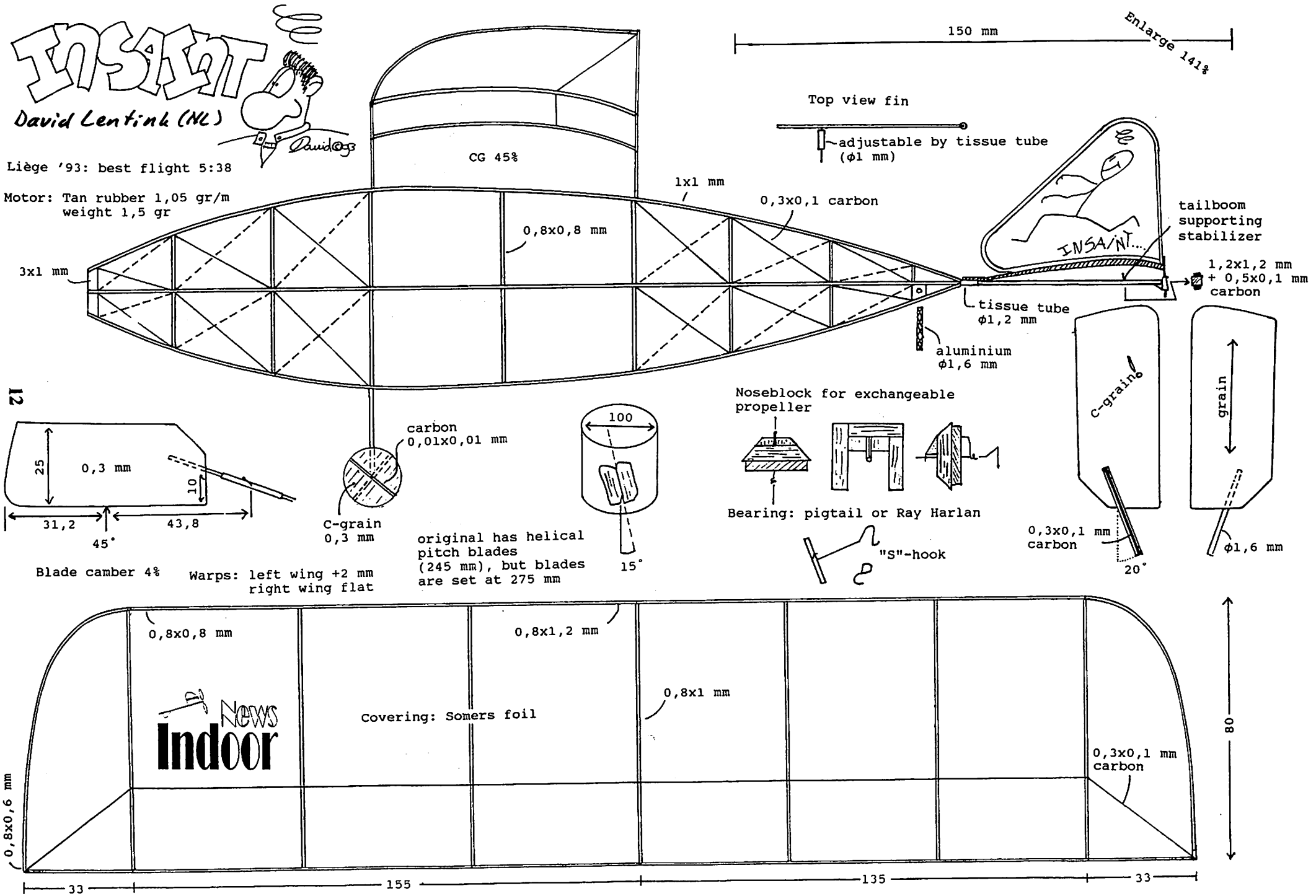
Albatross D-IV	Jodel D-9
Bede BD-4	No. American P-51B
Clipped Wing J-3 "Cub"	Rearwin "Speedster"
Corben "Super Ace"	SE5a
Corben "Cabin Ace"	Waterman "Gosling" Racer
Davis DA-2A	Nesmith "Cougar"
Fokker D-VII	

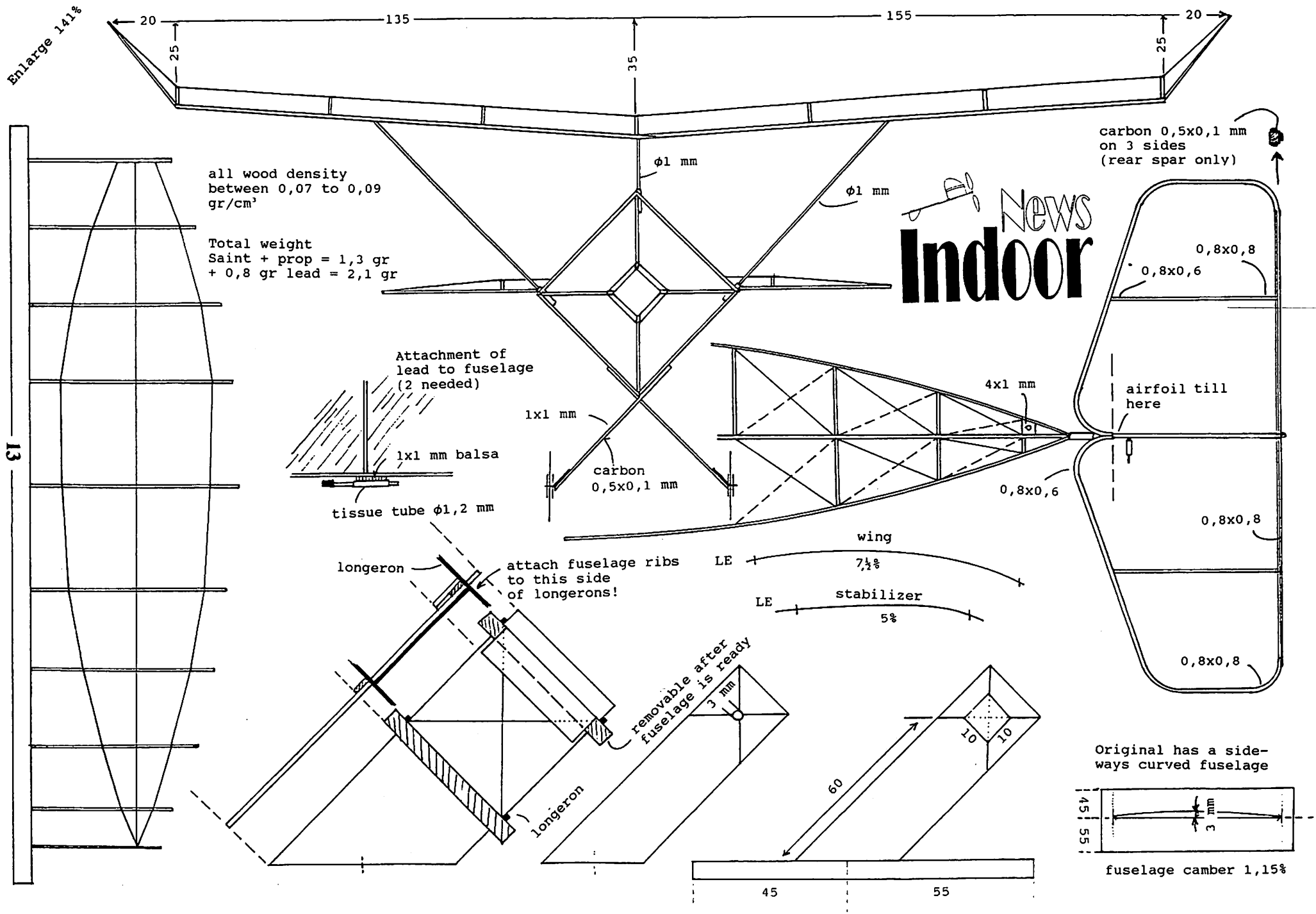
Plan Prices (PPD): 1-2 $1.70 each, then $1.00 each U.S.A. and all 13 for $9.95. +$1.00 surface mail or $2.00 airmail to Europe

Finally understand why any of your well-built models flew poorly (or not at all)

* Add $1 on all!

** To Europe: Airmail $1.30 Surface Mail 75¢


INSAINT
David Lentink (NL)
Liège '93: best flight 5:38
Motor: Tan rubber 1,05 gr/m
weight 1,5 gr
150 mm
Enlarge 141%
Top view fin
adjustable by tissue tube
(ϕ1 mm)
CG 45%
1x1 mm
0,3x0,1 carbon
0,8x0,8 mm
3x1 mm
tailboom
supporting
stabilizer
1,2x1,2 mm
+ 0,5x0,1 mm
carbon
tissue tube
ϕ1,2 mm
aluminium
ϕ1,6 mm
12
25
0,3 mm
10
31,2
43,8
45°
carbon
0,01x0,01 mm
C-grain
0,3 mm
100
15°
original has helical
pitch blades
(245 mm), but blades
are set at 275 mm
Noseblock for exchangeable
propeller
Bearing: pigtail or Ray Harlan
"S"-hook
C-grain
0,3x0,1 mm
carbon
20°
grain
ϕ1,6 mm
Blade camber 4%
Warps: left wing +2 mm
right wing flat
0,8x0,8 mm
0,8x1,2 mm
0,8x1 mm
Covering: Somers foil
News
Indoor
0,3x0,1 mm
carbon
80
0,8x0,6 mm
33
155
135
33


Enlarge 141%
20
135
155
20
25
35
25
all wood density
between 0,07 to 0,09
gr/cm³
Total weight
Saint + prop = 1,3 gr
+ 0,8 gr lead = 2,1 gr
ϕ1 mm
ϕ1 mm
carbon 0,5x0,1 mm
on 3 sides
(rear spar only)
News
Indoor
0,8x0,8
0,8x0,6
Attachment of
lead to fuselage
(2 needed)
1x1 mm
1x1 mm balsa
carbon
0,5x0,1 mm
tissue tube ϕ1,2 mm
4x1 mm
airfoil till
here
0,8x0,6
0,8x0,8
wing
LE
7½%
LE
stabilizer
5%
longeron
attach fuselage ribs
to this side
of longerons!
removable after
fuselage is ready
3 mm
longeron
60
10
10
45
55
Original has a side-
ways curved fuselage
45
55
3 mm
fuselage camber 1,15%

Why InSaint?

by David Lentink (NL)

Not all of what you're going to read might be true (so you're warned). That is because I am flying indoor for just a year and I am still a school boy.

1. The section of the fuselage below the wing does not have carbon fiber, thus the fuselage can twist. This has the most advantage at the beginning of the flight because then the torque is highest. Also the difference in lift between the inner and the outer wing is larger than during the cruise part of the flight (this is why the area of the inside wing is larger, the model turns left). This difference is caused by the different length of travel of the inner and outer wing, $S=2\pi R$. R is smaller for the inner wingtip than the outer tip. From $V=2\pi r/t$ it follows that the velocity for the inner and outer wing tip is different (t is equal for both). Lift is proportional to the square of velocity, thus it follows that there is more difference in lift between both wing halves during the climb (higher velocity) than during cruise (lower velocity).

By making the fuselage torsionally weak the wing will twist with the fuselage twist. The inner wing will warp positively, the outer wing negatively. When torque diminishes the warp will reduce and adjust itself to the flight speed. Advantages: not more drag due to warps as is necessary; less need for backing-off turns, so you can use more of the rubber energy. I also use a "flare"-propeller to use more of the available energy.

The remainder of the fuselage is strengthened to minimize changes to propeller thrust line and tail tilt.

2. The wing and stabilizer have self-stabilizing properties, which makes the model less sensitive for disturbances by turbulence or hitting the ceiling. The model recovers very quickly. You can drop the model (with few turns, 5%) from 1,5 m vertically. It will recover in just one meter and continue to fly level again.

3. "Winglets", in spite of most peoples scepticism about the claimed reduction in induced drag I believe in its advantages. It gives more "useful" wing area. It is generally accepted that a wing "should" have ± 0% camber to keep the induced drag low enough. By extending the wing into a winglet the tip vortex will be directed further outwards, which allows the use of more camber in the tip. Also winglets increase dihedral which benefits stability, particularly at the powerburst.

So: 1. the induced drag is lower
2. more useful area (more lift)
3. better stability.

4. The propeller is not ideal, it can be improved as Benno Sabel pointed out. The blades have to much forward sweep. The angle between propspar and blade can be reduced to 10°.

5. By placing ± 0,5 gr lead under the CG the model will fly more stably and will recover more quickly (larger moment = force x arm). The model doesn't have to be stronger, so do not build it more heavy.

6. The nose block construction allows the exchange of propellers without changing trim.

7. Everything on this model is adjustable and it can thus be trimmed quickly, which makes it easier to achieve maximum performance. Warps are: left wing + 2 mm, right wing flat. The model mainly turns on the tail tilt (so there is less danger of spiralling in under high torque). The InSaint turns left.

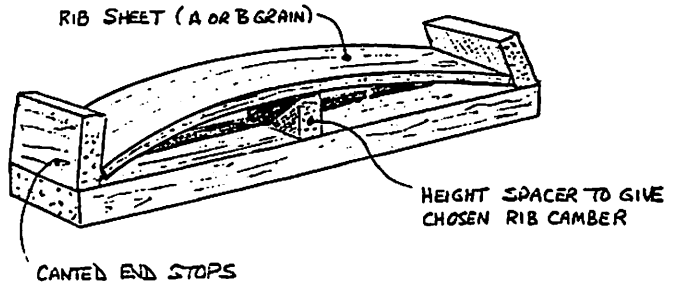
8. I have already co.ne up with some idea's for improvement, so there is still room for more progress in the Sainte Formule class. Up to 7 minutes!

Enjoy your InSaint!

MAKING RIBS

by Brian Kenny (GB)

I have recently been using moulded ribs for all my EZB/F1D wings and built-up props. A sketch of the type of jig I use is attached for your interest.



Brian Kenny. 8/9/93.

The end locators and the central transverse "height" spacer are superglued to the base (all from

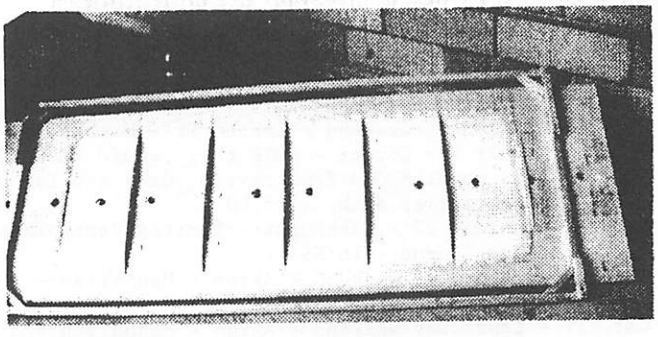
balsa wood). The height spacer of course determines the % camber of the rib and hence the same height of spacer ensures the same maximum rib height for both chordwise and diagonal ribs if these are used on the same wing.

I trim the length of sheet from which the ribs are to be sliced, whilst it is dry, and by trial and error till, when spring into place, it fits snugly and is held securely by the angled end pieces. The rib sheet is then soaked in hot water for ten minutes, replaced in the jig and dried in a low heat oven (or if I am in a rush as usual, I use a hair drier to dry the sheet + set the curvature). A "Laurie Barr" type of slicer is then used to slice off the required number of ribs from the edge of the permanently curved "rib sheet". Since the grain is along the rib, the bending stiffness of these ribs is optimised for their depth + thickness. So far they have not lost curvature in the sometimes damp Cardington conditions and you don't have to use C-grain wood.

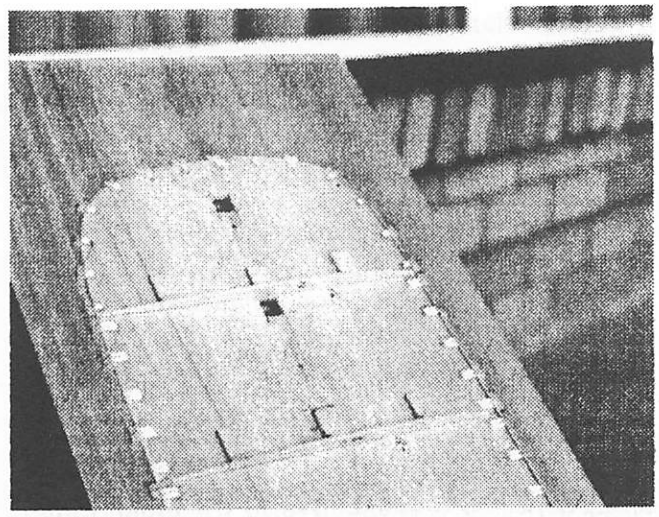
COVERING WITH MYLAR

by Boyd Felstead (AUS):

Referring to the article "Covering with mylar - A different view" on page 16 of IN 22 I suggest the covering procedure is doing it the hard way. Instead of placing the wing or tail freehand upside down on a taut frame of mylar (if the mylar is taut (tight), how does he allow for rib curvature?) it is much, much better to build and cover on a building/covering board similar to mine. See sketch in IN 2/88 and photographs below. As the wing is "anchored" (locked in) on the board around the small cardboard pieces cemented inside the outline (see photo) the spars won't warp, as with the other



method, when the adhesive (whatever) is applied and the frame of mylar (mylar applied slack to allow for rib curvature) lowered over the wing on the board. In an article in Free Flight News (UK) Laurie Barr mentioned that thin mylar carrying a high static charge "may cause the structure to fly



up to meet the frame of film (mylar) being lowered onto it and arrive in the wrong place". This should be unlikely in my method, but to be sure it doesn't happen tack cement the spars in a few places to the building/covering board.

Covering, yet another view

by Thedo André

The following method works surprisingly well. Tape a few sheets of newspaper onto your work place. Lay down the mylar covering and gently blow it flat until most wrinkles have disappeared. Tape down the four corners. Test drop the wing upside down for practice and to check that the sheet size is large enough. Coat the wing with thinned down contact cement. Pick up the frame in the middle with one hand. Two hands may cause damage. Slowly lower the frame onto the sheet and let it drop the last 2 cm. Press/tap down the leading edge in the middle, press the right corner and the left corner. Make vertical taps only so that the frame will not shift sideways. Tap the leading edge down in some more spots. The frame is now secured along the leading edge. If the wing has much curvature then the taped down corners of the mylar sheet at the leading edge corners have to be loosened. Simply cut the mylar diagonally in front of the tape with a razor blade. Gently tap the center rib down, starting at the leading edge towards the trailing edge. The wing will roll along. Now press down the remaining outer corners. Tap down the entire surrounding cm by cm, followed by the ribs (if they are coated, which I seldomly do). The newspaper sheets facilitate cutting the excess film afterwards. If the rolling over gives problems then it may help to cut loose the leading edge corners of the newspaper sheets also. I have teached this method to many kids and beginners without much problems. It works best with the somewhat heavier films and frames.

DIARY

1 Jan-31 March 1993	**Living Room Stick Postal International.** Mike Colling, 403 Mossy Lea Road, Wrightington, Wigan, Lancs., England, WN6 9SB, Telephone 0257 452624.
18-19 June Orleans France	**13th International Indoor**, F1D + Beginner + EZB, J. Delcroix, 7 Rue de Foncemange, 45000 Orleans, France, tel. +34 925 130923
25-28 Aug Liège Belgium	**18th International Indoor**, All classes, F. van Hauweart, Rue de l'Ermitage, 8, B-4400 Flémalle, Belgium.
20-25 Sept Slanic Romania	**1994 Indoor World Championships**, Federatia Romana de Modelism, Str Vasile Conta 16 Sect 2, 70139 Bucarest, Rumania. Tel. 40 131 20-160,fax 40 131 20161. See details in IN24.
26/27 Sept Slanic Romania	**F1D Open International**, Federatia Romana de Modelism, see above.

Italian Indoor Championships

Gorizia, June 26-27, 1993

Sport-Ins (=F1D-Beg)

1. R. Tabellini	Bologna	10'43	10'43	**21'26**
2. N. Sighelle	Bologna	10'32	8'57	**19'29**
3. C. Cotugno	Roma	9'36	9'02	**18'38**
4. G. de Angelini	Siena	9'03	9'15	**18'18**
5. M. Ghisalberto	Siena	8'24	8'43	**17'07**
6. E. Ronconi	Roma	8'13	8'07	**16'20**
7. F. Piaginiani	Siena	7'57	8'15	**16'12**
8. A. Russo	Gorizia	6'07	5'23	**11'30**

F1D Microfilm

1. C. Cotugno	Roma	20'19	21'04	**41'23**
2. G. Masciullo	Roma	19'36	19'08	**38'44**
3. R. Tabellini	Bologna	16'33	12'32	**29'05**
4. G. de Angelini	Siena	14'02	13'44	**27'46**
5. E. Ronconi	Roma	11'41	11'30	**23'11**
6. N. Sighelle	Bologna	10'58	11'24	**22'22**
7. M. Ghisalberti	Siena	9'57	10'43	**20'40**
8. A. Russo	Gorizia	4'11	2'35	**6'46**
9. F. Piaginiani	Siena	1'10	3'34	**4'44**

1st Spanish Indoor Championships

Linares - December 5, 1993

Report by Santiago Rodriguez Garrido (SP)

I am just returning from the first Indoor Championships of Spain. They were held in Linares, a small town north of Andalucia, near Bailén, 285 km south of Madrid. To note: a big number of junior entrants; many outdoor free flighters competing (myself included). Very good organisation and almost new hall with 8,65 m heighth of unrestricted space, with catwalks giving easy access to every corner of the ceiling. As I do not yet have the full results I will memorize the positions in different categories:

F1D - 8 competitors, only two of them of "standard" design, but models well in the heavy side. No variable pitch proppellers. The winner: a junior girl of only 8 yrs! 2nd: Miguel Cantos, a weil known F1C flyer.

F1L - (1,2 gram) This seems to be, to date, the best access door to indoor for the average modeller. Ten contestants, the winner is the president of the Albacete Aeromodelling Club (I don't remember his name, because he devoted himself to the administrative and organisational work for his club, not an active modeler, to date!). I finished second with a long model, covered with the foil Jan Somers supplied me some time ago.

Special (Open) Formula - 365x85mm wing, 50% tail, 1,2 g. The biggest number of contestants (14) including 6 juniors. I also competed with an old EZB, finishing second. We saw a wide diversity of models from the sophisticated to the ones powered by elastic bands (the biggest available in book and paper stores). I powered my model with the new Tan II batch sept '93. It is very soft and "spongy" like "pudding". Good for the cool morning hours.

Peanut - Only two contestants. The winner belongs to my club. He flew a Piper Tri-Pacer without landing gear, "lost" in a hard landing two years ago. With respect to this last category I must beg you some help: I intended to compete with a scale model of the REX monoplane, circa 1911. Where can I get a plan of such an airplane? (Anyone?)

HLG - As current champion of Spain in the outdoor HLG I expected to win, but I was beaten by my pupil Roberto Rodriguez from the "TDJO" club (Toledo). There were nine contestants.

There were modellers from the following autonomies: Andalucia, Castilla-La Mancha and Madrid. For the next year the Federation of Air Sports of Castilla La Mancha is asked to organise the National Indoor Championships. Date unknown. Place: Toledo, downtown in one of the big halls of an old palace (XVI Century). Santiago's address: Emilio Gastesi Fernandez, 5-4.°B, 28027 Madrid, Spain.

Ed Dolby's new rubber assists record flights

(from New York Indoor Times)

Just asbetter quality rubber in the post World War II years aided Pete Andrews and Bill Tyler to make the first indoor flights over thirty minutes long, so Ed Dolby's improved Tan rubber has resulted this summer and fall in a rash of high personal times and new AMA National records. Here is a list of such record shattering times, all made with the "new" Tan rubber, as compiled by Walt Van Gorder:

* Cat. IV - July 4th weekend -Akron - EZB - Larry Coslick - 26:10
* Cat. IV - July 4th weekend - Lakehurst - EZB - Walt Van Gorder - 26:37
* Cat. IV - July 4th weekend - Akron - Ornithopter - Al Rohrbaugh - 17:38 World Record !
* Cat. IV - July 4th weekend - Lakehurst - Limited Pennyplane - Tom Greene - 16:31
* Cat. IV - July 4th weekend - Lakehurst - Manhattan - Joe Krush - 13:04
* Cat. IV - July 4th weekend - Lakehurst - Manhattan- Walt Van Gorder - NOTE this record disputed as model ROG'd from carrier deck and landed on carrier deck. - 13:09
* Cat. IV - August 27 - Lakehurst - Limited Pennyplane Tom Greene - 16:55
* Cat. IV - Labor Day weekend - Akron - Manhattan - Walt Van Gorder - 13:37
* Cat. IV - Labor Day weekend - Akron - Manhattan - Walt Van Gorder - 14:26
* Cat. IV - Labor Day weekend - Lakehurst - Manhattan - Jim Grant - 14:57
* Cat. IV - Labor Day weekend - Akron - Pennyplane - Chuck Slusarczyk - 17:42
* Cat.III - October 3 - Flint, MI - Manhattan - Walt Van Gorder - 11:32 - Note flight made in 79' bubble and was 'no touch'.
* Cat. II - Date ? - California - EZB - Bob Gibbs - 17:21 (also 18:30 unofficially)

TAN II: Send $1.50 for catalog to FAI Model Supply, P.O. Box 3967, Torrence, CA 90610. U.S.A.