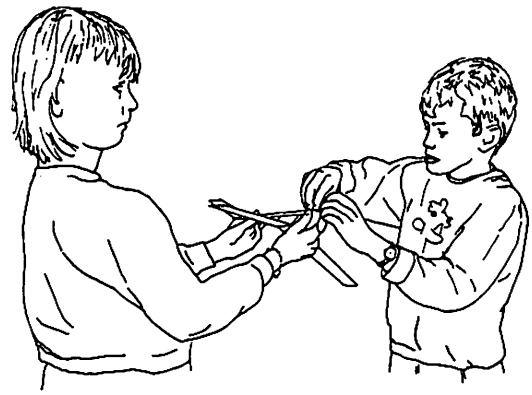
Indoor News

Issue 46 May 1998



DIARY

16 May Oerebro Sweden	**Swedish Indoor championships** Classes: F1D, F1L, 50-oeres (F1D-beg), Manhattan Cabin, Nocal, Miniflug (Delta Dart and other simple planes), and Peanut F4F. Contact: Daniel Hartstein, Ekvägen 2C, 133 34 Saltsjöbaden, Sweden.
22-24 May Donetck Ukraine	**Donbass Cup, F1D.** Entry $20. Contact: V. Moskalev, Krasnoflotskaya 74, 340053 Donetck, Ukraine, tel +380 622 942010, fax +380 622 946159
27-30 May Johnson City USA	**1998 U.S. Indoor Championships.** Site: Memorial Center Arena, East TN State University. Contact: 5432 Haft Rd., Cincinnati, OH 45247, USA.
20-21 June Orleans France	**Concours International d' Orleans. F1D, F1L, F1D-B.** Entry FF 100. Contact: J. Delcroix, 41 Allee du Caudray, 45160 Olivet, France, tel +33 238 634957
3-5 July Olkusz Poland	**Polish Indoor Model Championships / International Memorial Contest of Ryszard Czechowski** Classes: F1D & F1L. Details see elsewhere in this issue.
1-4 Aug Moscow Idaho USA	**Kibbie Dome Annual + EZB International,** Andy Tagliafico, 10039 S.W. Quail Post Road, Portland, OR 97129, USA, T +1 503 452 0546.
? Aug Gualeguay Argentina	**Argentine 98 Indoor Championship.** Contact: Jorge Conti, Tel 54 1 644 2121, Fax 54 1 778 4590, E mail: aumnteng@satlink.com.ar
27-30 Aug Angleur Belgium	**Indoor International. All classes.** Contact: B. Delhalle, 62 rue de Souvret, B-4000 Liege, Belgium, tel +32 4275 0523. Details see elsewhere in this issue.
29-31 Aug Cardington England	**British Indoor Nationals.** Contact: Laurie Barr "Herries Cottage", Winter Hill Road, Pinkneys Green, Berks., England SL6 6PJ, tel 01628 487544.
11-17 Oct Slanic Romania	**F1D Indoor World Championships 1998.** Contact: Federatia Romana de Modelism, Str Vasile Conta no. 2, sector 2, 70139 Bucharest, Romania, tel +40 1211 0160, fax +40 1210 0161.

POSTAL/PROXY EVENTS

Winter 98/99	**AeroNutz Indoor Schneider Cup,** see info in IN 45, note address correction: 199A Knighton Church Rd, Leicester LE2 3JP, England.

Wing experiments on a F1M (F1D-Beginner) model

by Jonas Romblad (SWE)

(This article is an updated version of the one on Daniel Hartstein's website: http://www.astro.su.se/~daniel/).

Introduction by Sven Pontan: *Jonas Romblad works as a "windtunnel engineer" doing aerodynamic research. His new 50-öres (F1M/F1D-beginner) model flies just as slow as old F1D's. I am really impressed by his performance! He covered the plastic film on the underside of the wing. But the the ribs are glued on top of the trailing edge, and he made a small notch in the film at each rib, just in front of the TE, so the film could be glued to the top of the TE. I hope that's understandable!*

Over to Jonas and his story:

Does the film go on the top or the bottom of the wing? This question from a beginner made me

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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Editor:
Thedo André
Meijhorst 35-43
NL-6537JD Nijmegen
The Netherlands
Phone/Fax +31 24 3450711
E-mail: Thedo.Andre@net.HCC.nl

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recapture an experiment performed while designing my current F1D-beginner model in 1995.

First, let's rephrase the question slightly. On a mini-stick, F1L (EZB) or F1D, we all know the covering, curved to an arch, is making up the major part of the airfoil. The question could therefore be; where, with respect to the covering should the ribs and especially the spars be placed?

To answer this question some tests were performed using a small balsa wood glider. The glider had a sheet balsa wing curved to an arch, camber being 4-5% of the cord. The wing had a chord close to 1/3 the chord of the F1D-beginner I was designing and flew about 3 times as fast. This meant the glider and the F1D-beginner operated in the same Reynolds number regime - something quite important for this kind of test. The glider was flown from a catapult which would launch it at the proper glide angle and airspeed. All testing was done indoors to eliminate wind interference.

To simulate the leading and trailing edge spars, several layers of adhesive tape were laminated to the scale (1/3) height of the full scale spars and cut to the scale width. These "spars" were then placed on top or bottom of the sheet balsa wing to simulate the real spars being put above or below the covering.

The flight times were too short to measure performance directly, but the flight behaviour of the model was studied. The model was flown both in symmetric and asymmetric configurations, for instance leading edge on top of the right wing but below the left.

Using the normal (both spars under the covering) as a reference the following observations were made:

Symmetrically placed "spars".
1. LE spar above and TE spar above covering: Slight dive. CG moved aft to trim.
2. LE spar below and TE spar above covering: Steeper dive than in 1. CG moved more aft than in 1.
3. LE spar above and TE spar below covering: Nose up or stall. CG moved forward to trim.

Asymmetrically placed "spars" induced rolling and yawing. If the left wing was left in the reference configuration (both spars under the covering) the following observations were made:
4. LE spar above and TE spar above covering: right turn.
5. LE spar below and TE spar above covering: right turn. Tighter than in 4.
6. LE spar above and TE spar below covering: left turn. Less tight than in 4 and 5.

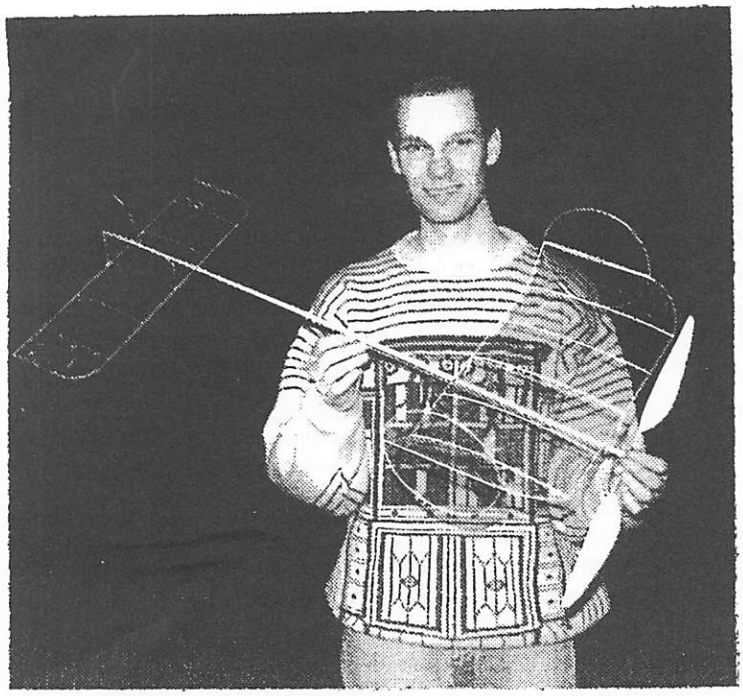
My conclusion was that the wing with the leading edge above and trailing edge below the covering generated more lift than the other configurations. However, there are possible pitfalls. As the leading edge was moved to the top of the covering, the point of stagnation was possibly moved along with it. This would mean that the effective angle of attack was increased with increased lift as a result; something which does not mean any gain in performance. It should also be noted that the method used is too coarse to clearly detect any changes in drag.

So, what caused the apparent change in gliding behaviour?

The positive effects of having a small "lip" hanging down under the trailing edge of an airfoil has been known for long. Such a device, called a "Gurney Flap", will generally increase maximum lift at a small increase in drag. The TE spar acts as a Gurney flap increasing lift, as indicated by the experiments.

What happens around the leading edge spar is more complicated and strongly coupled with the low Reynolds number our models are operating at. My theory is that the leading edge placed on the wing upper surface acts as a turbulator, trigging or at least helping a transition to a turbulent boundary layer. The turbulent boundary layer is less prone to separating and an early transition may therefore increase maximum lift and perhaps reduce drag.

As mentioned earlier, I have built a F1D-beginner model using the results from the tests described.The wing has the leading edge on top of the covering and the trailing edge on the bottom. For practical purposes, the ribs were placed above the covering. As the ribs represent a very small part of the wetted surface I doubt the increase in drag due to the higher velocities on the upper surface will have any but a neglectable effect. Putting the ribs on top makes the covering process easy, maybe even easier than covering the normal way. Since the air loads will push it against the ribs, the film can be spot-glued to the rib every inch or so. The result is a slight gain in weight, though probably not enough to matter.



Jonas Romblad's F1D-Beginner model. Everything on this model is demountable, the wing (of course), stab, rear fuselage and endplates, which makes this large model very easy to transport. Apart from the endplates the wing has yet another unusual feature, it is covered on the underside instead of on the upper side.

Although far from a comparative test, the model flies quite well at a very low speed. Flight speed at cruise has been measured to 0.8 m/s. It has been flown at two Swedish Championships, 1995 and 1997, placing first both times.

Jonas Romblad
rdj@ffa.se

CIAM Plenary Meeting

The following are indoor related topics extracted from Ian Kaynes' report on the CIAM Plenary Meeting held in Paris on March 25 to 27.

F1M. The indoor class "F1D Beginner" will be identified as F1M with the general name "Indoor model". Under a difference between rule change requirements for the Sporting Code and for provisional rules, the formal inclusion of the reference to F1M the Code does not come into effect until 2001, but the name change is formally effective 1999.

Indoor Hand Launch Glider. A specification for this class had been proposed by the FFSC and was accepted with a change removing a proposed requirement for solid construction. As for F1M, the formal definition comes in 2001, but the class rules nominally apply from January 1999. The rules were published in IN45. From Par. 3.N.2. the lines about "construction" are removed.

Indoor model winding. The proposal from France to require F1D models to be wound by the competitor was passed unanimously (2001).

Eligibility for championships. The UK had proposed increasing the number of teams necessary for a valid World Champs from 5 to 7 anf 3 to 4 for Continental Champs. This would serve to remove championship status for some small events, to help make room for new classes. F1D and F1E could have become vulnerable. The proposal was defeated 14 for, 12 against, 2 abstaint (i.e. failed to gain an absolute majority) but the total number of votes counted different from the declared number. Nick Neve, UK delegate, pressed for the vote to be retaken but this also gave a defeat 14-15-1.

Records. Competition records are added as follows (effective from 2001):

- F1L and F1N indoor duration, 4 ceiling categories
- Indoor competition records for F1D and F1L for the longest single flight, the best two fligth total, and the best total from all six flights.

F1D Indoor World Championships 1998

SLANIC-PRAHOVA, ROMANIA
DATE: 11- 17 October 1998

ORGANIZERS: The Romanian Modelling Federation in cooperation with the Romanian Aeroclub and Salt Mine Slanic-Prahova.

VENUE: The Salt Mine of Slanic-Prahova, where 1970, 1982, 1994 W.Ch. and 1973, 1991 and 1997 E.Ch took place.

FAI JURY: Sandy PIMENOFF, Ian KAYNES, Mihail ZANCIU, Pierre CHAUSSEBOURG (reserve)

ENTRY FEES:
-225 USD / senior competitor, TM, trainer
-175 USD / junior competitor
- 45 USD / helper, supporter

BOARD AND LODGING: 40 USD / pers / day in a two star hotel (Hotel and Restaurant Slanic, 2 km far from the Salt Mine). BANQUET: 25 USD / pers.

THE UNDERGROUND HALL: the Slanic Salt Mine offers matchless flying conditions, thanks to its large size and being thermoinsulated and draughtless, allowing a proper checking of the true performances of the models (constant temperature of 12-15 deg.C and 70% humidity). The Salt Mine is 64 m high, 33 m wide and 118 m long.

The Salt Mine hall is a IV degree one and is exclisively at Romanian Modelling Federation disposal. The walls, floor and ceiling are flat, without protuberances and trapping areas. The external weather does not influence at all the airmodels flights. During September-October, the average external temperature is equal to that one inside the Salt Mine. The access in the Salt Mine hall (122 m deep) will be possible by 2 alternative speed elevators, each of them having a 10 pers. capacity.

SCHEDULE
-11 Oct, Sunday : arrival, accomodation and registration at Hotel Slanic

-12 Oct, Monday : training session, opening ceremony, technical meeting
-13 Oct, Tuesday : rounds 1 & 2
-14 Oct, Wednesday:rounds 3 & 4
-15 Oct, Thursday: rounds 5 & 6
-16 Oct, Friday : reserve day, Euro Indoor Open (rounds 1-4), closing and prize awarding ceremony
-17 Oct, Saturday : departure

OTHER INFORMATIONS: The Slanic City is 104 km North of Bucharest, via Ploiesti, and can be reached by car or railway. The participants coming by plane will be met at Otopeni Airport by a Romanian delegate and accompanied to Hotel Slanic.

CONTACT ADDRESS:
FEDERATIA ROMANA DE MODELISM
Mihail ZANCIU
Str. V.Conta no.16,
70139 Bucharest - sector 2
ROMANIA
Fax: (40-1) 210.01.61.
Tel.:(40-1) 211.01.60
http://rmf.kappa.ro

Polish Indoor Model Championships

The Cracow Aero Club kindly informs that from July 3-5, 1998 in the sports hall in Olkusz the Polish Indoor Model Championships as well as the **International Memorial Contest of Ryszard Czechowski** will take place (classes: F1D & F1L ie. EZB).

The competition will run according to the following rules: There will be 6 starts in each category. Everyone who fulfills the requirements of entering the competition can compete. From among those champions of Poland in F1D class (seniors and only Poles) as well as champions of Poland in F1L class (juniors and only Poles) will be nominated. The winner of the Championships (the one who achieves the best result) receives the Memorial Cup of Ryszard Czechowski. The best of the Polish competitors receives the title of Champion of Poland (valid to both classes). Everyone who declares his/her willingness to be a competitor to the organisers can enter the competition. Every competitor can compete in both classes (F1D and F1L).

The contest will be held in a town called Olkusz (between Katowice and Krakow) in a sports hall which is 7,5 m high. The results achieved in the hall are 36'20 in F1D and 11'50 in F1L. The models do not attach to the roof construction. Entry fee for the competitors who are not members of the Aero Club of Poland is 10DM. Accommodation and meals are available on the spot (one night's lodging is approx. 12DM; meals approx. 12DM).

We invite you to Poland!

Magdalena Czechowska
ul. Dietla 44/11
31-039 Krakow
Poland
tel +48 12 4231134

Indoor Contests in Belgium

28 June	Chimay-Baileux, Salle du Sudhaina. Contact: Emile d'Hondt, tel. 060-2117 78
27-30 Aug	**20th Indoor International Flemalle**, Saint Severain, tennishall "Club du Condroz". Contact: Bernard Delhalle, tel. 04-231 07 92.
20 Sept	Flemalle, Salle Omnisports André Cools, Rue-du Beau-Site, 25, Flemalle-Haute (Trixhes). Contact: Bernard Delhalle, tel. 04-231 07 92
? Okt	Strepy-Bracquegnie, Centre Culturel de Strepy. Contact: Jean Marie Melice, tel. 064-675742

At the contests in Belgium the following rules for the Bostonian Junior class will be used:

"Simplified"-Bostonian Rules

(Category for juniors only)

DEFINITION	Rubber powered model for indoor flying
CHARACTERISTICS	
Fuselage	Total max. length, excl. propeller: 355 mm. Min. cross section: 30 mm x 63 over a length of 76 mm (volume 30x63x76)
Wings	Max. projected span: 406 mm Max. span of monoplane: 75 mm If biplane: max. sum of chords 100 mm, with one chord 40mm min
Tail	Max. span: 200 mm Max. chord: 60 mm
Undercarriage	Two legs and two freely revolving wheels obligatory; min. diam.: 18 mm.
Propeller	Max. diam.:165 mm; compulsory in plastic
Covering	Japan paper
Motor	Rubber; length and cross section unrestricted, enclosed by the fuselage. Multiple propellers not allowed.
Weight	Min. weight of airplane, ie. without motor: 10 grs.
Flights	Contest to be flown over 6 flights with one take-off obligatory. Scoring to be the total of the two best flights.
Attempt	Less than 10 seconds.
Collision	In the event of a collission with an obstacle, the competitor must decide to make a re-flight or to retain the time of this flight. The recommenced flight must be flown before the next official flight.

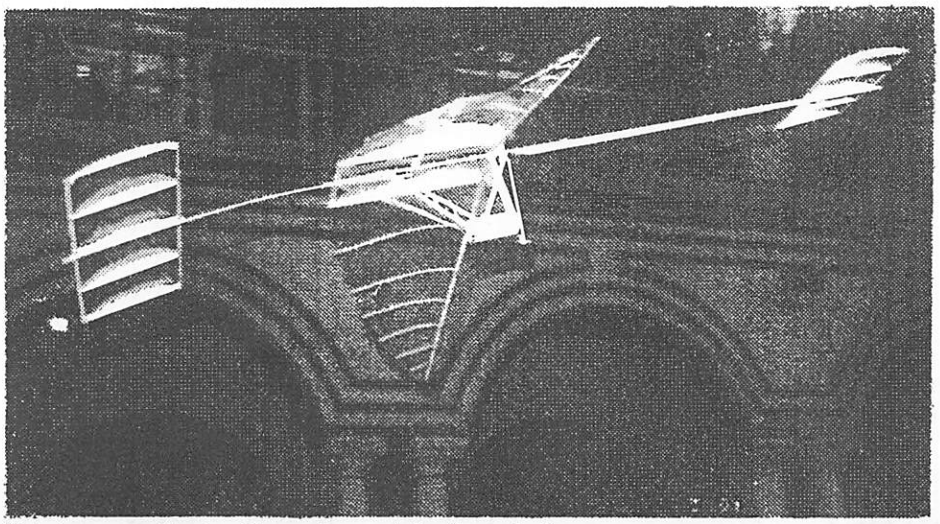
Balsa

A note from Lew Gitlow (Indoor Model Supply): Regards Balsa, the requests for ALL OF ONE SIZE BALSA will be filled with an assortment of sheets close to the size and including the size ordered, in order to allow everyone to obtain first class material. I will try to make the WEIGHT, strength, and uniformity meet the demanding requirements of motor stick sheets, prop blades, and spars. EVERYONE WORLD WIDE WILL BE TREATED EQUALLY.

Stockholm Blå Hallen meeting 1998

Report by Daniel Hartstein

As usual the Blå Hallen indoor meeting was held in January this year. We are fortunate to have access to this large hall with its high ceiling (21 m); it is the Stockholm town hall and is also used during the Nobel Prize ceremonies. There were three competitions; the Leijon Nocal trophy, the Solna Flugan (Delta Dart) competition and, new for this year, a 50-oeres (F1D-beginner) competition. The Nocal and Flugan competitions attracted a record number of entries, 41 and 31 respectively, with the help of a large Finnish contingent.



This large ornithopter (2 m wingspan) by Kenneth Barman was first seen at the Blå Hallen meeting 1997. It has a weight of 250 grams, and managed to hold a level course as long as the (very short) rubber motor was propelling. The ribs are individually hinged to the front spar, and the construction features a "return spring" to equalize the motor load on the up- and downstrokes

The rules used in the Nocal Trophy specify a minimum weight of 6.2 grams. Ginger Sjoeberg won with her Bumble Bee racer and a best flight of 206 seconds. Tomas Leijon, the originator of this competition, came a close second. He flew a Heinkel 178, the very first jet aircraft. At 10 grams it is overweight, but clearly shows the potential of freakish models. He intends to build a lighter one for next year. The Best-in-Show prize was given to Daniel Hartstein's Westland-Hill Pterodactyl 5, an experimental tailless biplane fighter from the twenties. Initially hard to trim, it now flies as if on rails. Best biplane was Anders Sjoeberg's SE 5A, with 2 min+ duration.

The Flugan competition was flown in three rounds with 40 s max, and then flyoffs with 60 and 80 seconds max.. Two attempts were allowed for each flight. In this way, the competition becomes more exciting, if also more time-consuming, than it would be if just counting the x best flights of y attempts. The competitors left after the 80 sec. flyoff, 2 juniors and 4 seniors, then flew an unlimited flyoff. More than one flyer had broken the 90 sec. level previously, but in the flyoff Janne Lauren was the only one to make more than 80 sec. The top two seniors got the same duration, and so had to fight it out through yet another flyoff. The winners finally emerged as Janne Lauren (juniors) and Anders Haakansson (seniors).

The 50-oeres competition did only attract four entries, even if there were more models around. Jonas Romblad won, using his "unbeatable" model shown in the photo below, which has won every competition he has entered it in. Lasse Nyberg was however close behind, and the result was not decided until after the last flight.

Competitions aside, the motto of the Blå Hallen meetings is "Fly for fun". This was done with models of every size, from tiny pistachios to Kenneth Barman's gigantic rubber powered ornithopters, one of which is shown below. Even if their flyability is a bit limited, their huge dimensions make them very impressive to the eye.

Another event which was popular with the public was the indoor RC demonstration. Several Bleriot's and Wespes flew at the same time and had ample room for maneuvering in the large hall. With the availability of small commercial RC-equipment, these ultralight RC-models have become quite popular.

Results

The Leijon NoCal competition (41 flew)

No.	Competitor	Plane	best flight
1	Ginger Sjöberg	Bumble Bee	206
2	Tomas Leijon	Heinkel 178	192
3	Anders Sjöberg	Spitfire	173
4	Anders Sjöberg	Mig-3	170
5	Åsa Kivling	Spitfire	168
6	Anders Håkansson	AirCobra	166
7	Lars Tolkstam	Bf 108 Taifun	140
8	Daniel Brånn	Focke Wulf 190	137
9	Birgit Törnkvist	Wittman Racer	135
10	Ginger Sjöberg	Blohm & Voss	130

The Solna Flugan (=Delta Dart) competition

The durations in the final, unlimited, fly-off are given.

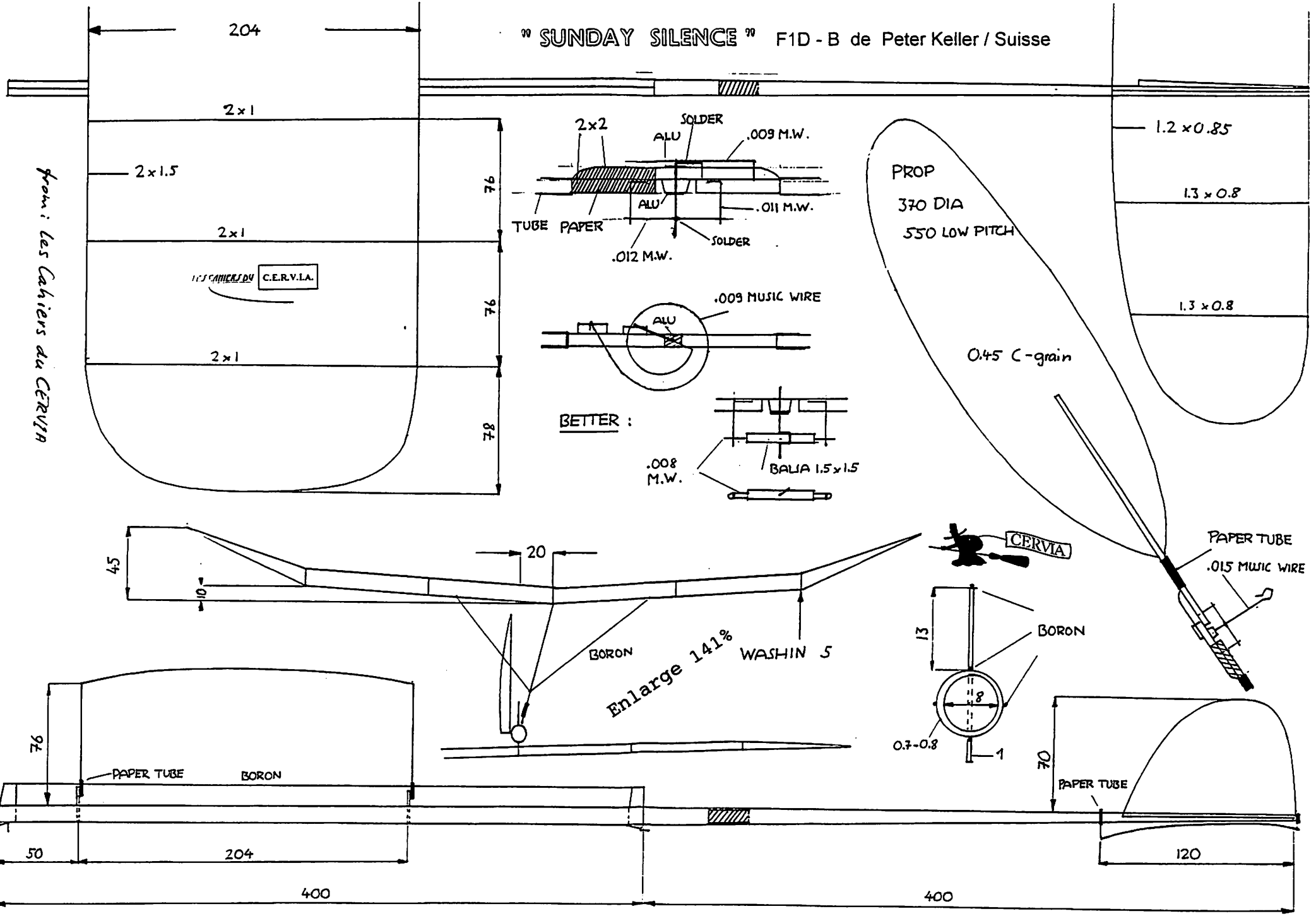
Seniors (18 flew)

No.	Competitor	
1	Anders Håkansson	79
2	Tapio Linkosalo	79
3	Daniel Hartstein	73
4	Lars Tolkstam	48
5	Olle Blomberg	-

Juniors (13 flew)

No.	Competitor	
1	Janne Laurén	84
2	Daniel Brånn	73
3	Lasse Nyberg	-
4	Viktor Wågman	-
5	Nico Berglund	-

" SUNDAY SILENCE " F1D - B de Peter Keller / Suisse



50-öres (= F1D-beginner) competition (4 flew)

Times given are two best flights and sum of two best flights (=result in competition)

No.	Competitor	flight 1	flight 2	Sum of two best flights
1	Jonas Romblad, Handen	705	566	**1271**
2	Lasse Nyberg, Finland	675	545	**1220**
3	Tapio Linkosalo, Finland	577	555	**1112**
4	Sven Pontan, Handen	424	411	**835**

Argentine Indoor Championships 1997

Report by Jorge Conti

The Argentine Indoor Championships 1997 were held during 4 and 5 October, in Paraná city, Entre Ríos province. There were more than 30 competitors including the visit of our friend Ulises Alvarez from Uruguay.

It was the first contest since 1993; and we hope that this one helps expanding this category in our country. The site was a basketball stadium with a height of approximately 8 mts (24 ft) with some obstacles. Outside the weather was rainy and wet. The competition was very well organized by the "Asociación Paranaense de Aeromodelismo".

These were the final results:

EZB 1.2grs

19 contestants — Best 2 from 5

1.	Muñoz Rómulo	405	395	**796**
2.	Molo Marcos	347	343	**690**
3.	Cuello Edmundo	350	320	**671**

P 25 (A6)

8 contestants — Best 2 from 5

1.	Lastra Oscar	163	166	**350**
2.	Muños Rómulo	155	142	**297**
3.	Martinez Adriana	136	156	**292**

F1D

4 contestants — Best 2 from 6

1.	Cuello Edmundo	727	384	**1111**
2.	Vaucelles Roberto	370	622	**992**
3.	Conti Jorge	630	11	**641**

MINI STICK

6 contestants — 2 flights

1.	Molo Marcos	**556**
2.	Vaucelles José	**502**
3.	Grippo Eduardo	**458**

ARGENTINE FORMULA

			static	flight	total
1.	Lastra Oscar	Rundum	16	168	**184**
2.	Lastra Oscar	Pampero	16	97	**113**
3.	Bausela Gabriel	Rundum	13	94	**107**

PIR Indoor Towed Glider

10 contestants — Best 2 from 5

1.	Molo Marcos	49	55	**104**
2.	Collaud Eduardo	35	41	**79**
3.	Boiero Roberto	35	36	**71**

PATITO (Little Duck)

2 contestants — 2 flights

1.	Madrid Carlos	**259**
2.	Molo Marcos	**205**

PEANUT

5 contestants

1.	Ulises Alvarez	Uruguay	Farman
2.	Muñoz Rómulo	Argentina	Voisin
3.	Molo Marcos	Argentina	14 Bis

Contest Rules for local categories:

PIR (Indoor towed glider):

Projected Span : 65 cm

Microfilm is not allowed.

The glider is towed by hand with a line with no restriction length.

ARGENTINE FORMULA

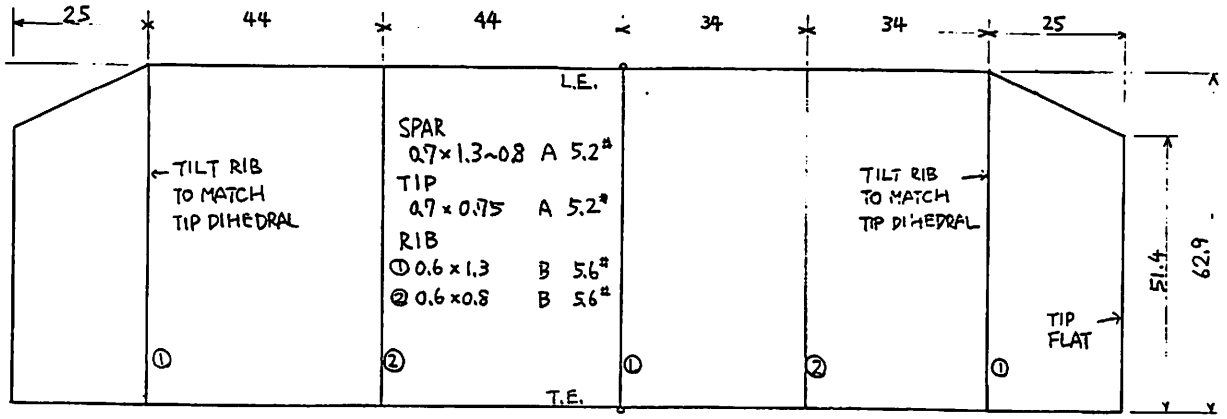
Projected wing span:	33 cm
Max chord:	8 cm
Projected stab span	15 cm
Max chord:	6 cm
Fuselage length:	33 cm
Main cross section	3x4 cm
Clear cabin	
ROG	
Propeller diam.	15 cm
Prop chord max	2,5 cm
Weight	10 gr

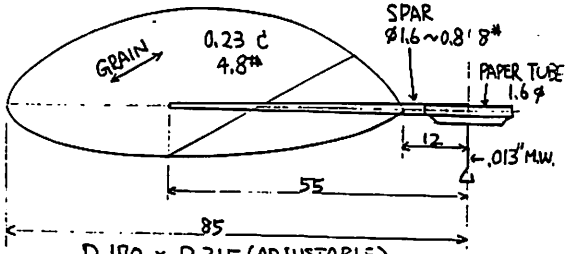
Mini^2-Ran^2

by Akihiro Danjo (JPN)

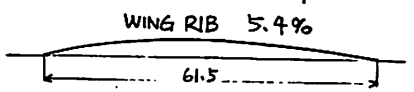
This Mini-Stick model is named after my favorite Japanese singer, RanRan Suzuki. When I designed it, I was just an indoor beginner. So, I was much influenced by the American design Mini Stick - K777, Mini-Quark, WINKS2, etc.. The tubular motorstick is slightly stronger than the solid stick against twisting. You may think that it will be lighter than a solid stick, but that is not always the case. Although it is short, it needs reinforcing at both ends. You will be able to get an equally strong solid stick, if you have good wood and can find the right cross section. The main reason why I use a tubular stick is practice for F1D! I have never before rolled such thin balsa! Prop pitch and rubber combination in my drawing are for low and uncatchy ceiling.

I don't know the final result of the '98 Mini Stick Postal Contest, but I could get a good result: 10 min. 10 sec - 9 meter ceiling, 917 points or so.

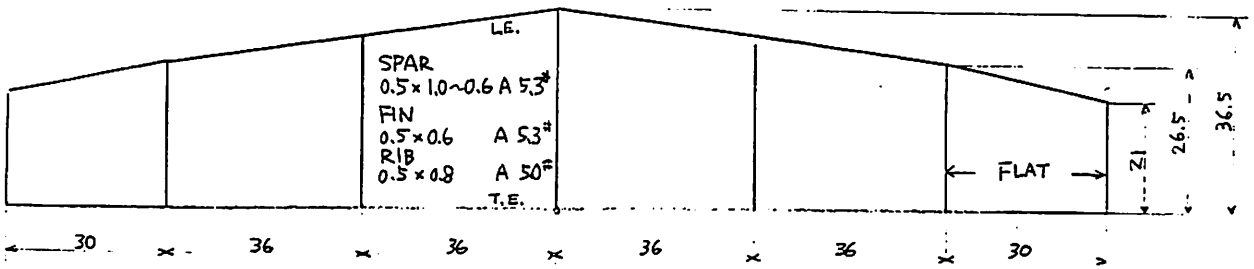


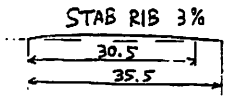


D. 170 × P. 315 (ADJUSTABLE)
MOTOR : FAI TAN II 135± mg/10cm LOOP × 330±



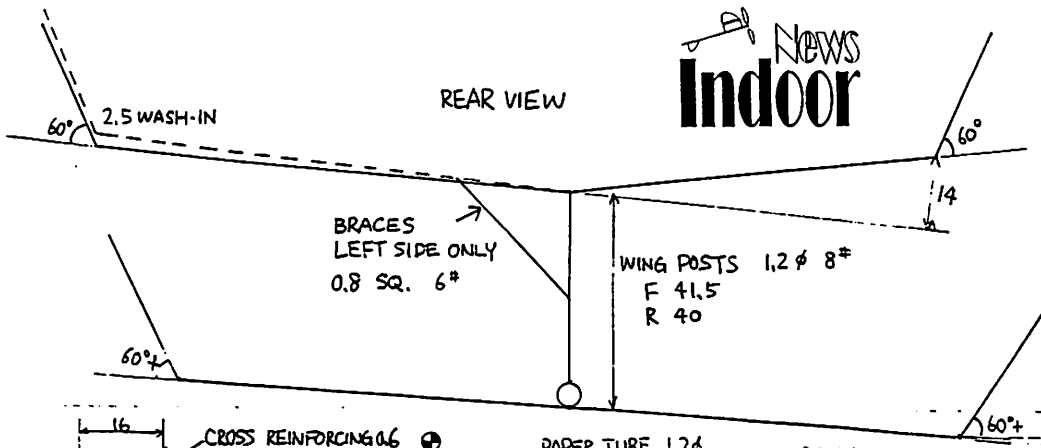
COVERING : POLY MICRO
~HOT DYED BLUE
FOR IMPROVED VISIBILITY





WEIGHTS (g.)

STICK	.14 +
BOOM	.02 +
WING	.11
STAB	.04 +
PROP	.11
TOTAL	0.43+



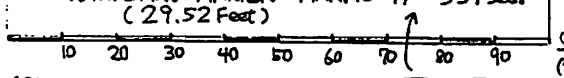
Indoor News

Mini²-Ran²

MINI-MINI — RAN-RAN

BY AKIHIRO DANJO FEB. '97
檀上彰宏 TOKYO JAPAN

KAWASAKI-MARIEN MAR. 16 '97 539 sec.
(29.52 Feet)



SCALE (m.m.) 25.40=1"

MY FIRST CONTEST!
—BEGINNERS LUCK!!

Enlarge 141%

MEASURING RUBBER STRIP WIDTH

KAI K. HALSAS

1. GENERAL

Measuring the rubber strip width after stripping is quite difficult. It is difficult to apply an even and constant pressure every time you take a reading with your caliper no matter what kind of caliper you have. The narrow size strips eg. for LRS models are especially difficult to measure.
The cross-section of the strip can also have different shapes, not necessarily with square corners.
A measurement based on weight per length unit could be more accurate.
Indoor modelers have special indoor scales which will give quite reliable readings. even if the scales are "home made".

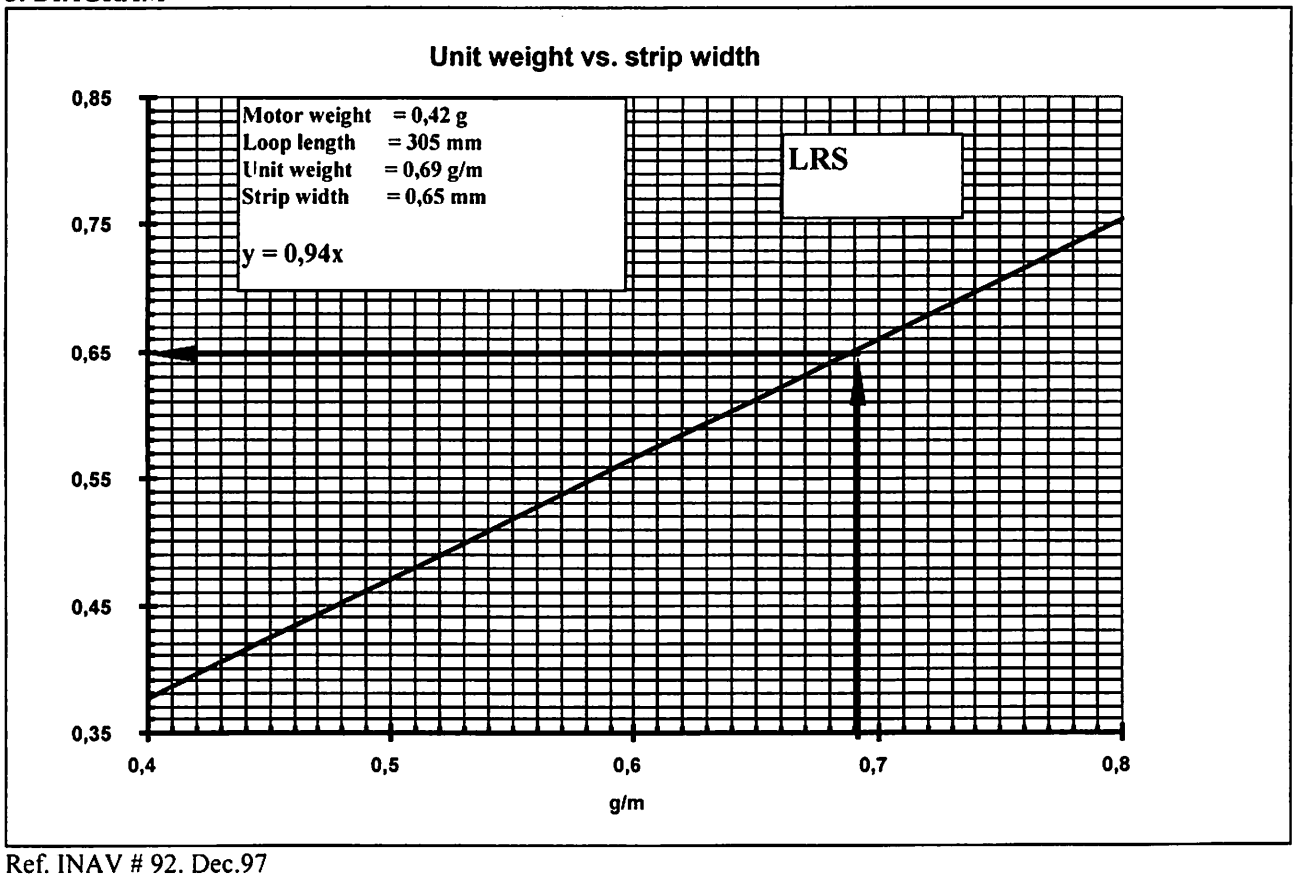
2. CALCULATIONS

I made a 4007 mm strip of 1/4" TAN II (Batch ???). The weight was checked with the local friendly pharmacists precision scale. The weight of that strip was 27,01 g. My own OHAUS scale gave a reading of 26,6 g.

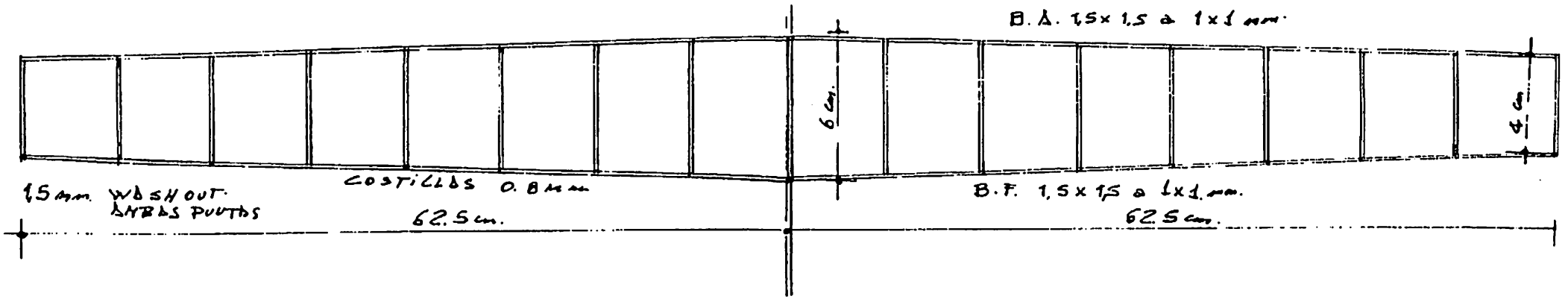
The weight per m of a 1/4" = 6,35 mm, strip is then $\frac{1000 * 27,01}{4007} = 6,7382 g/m$

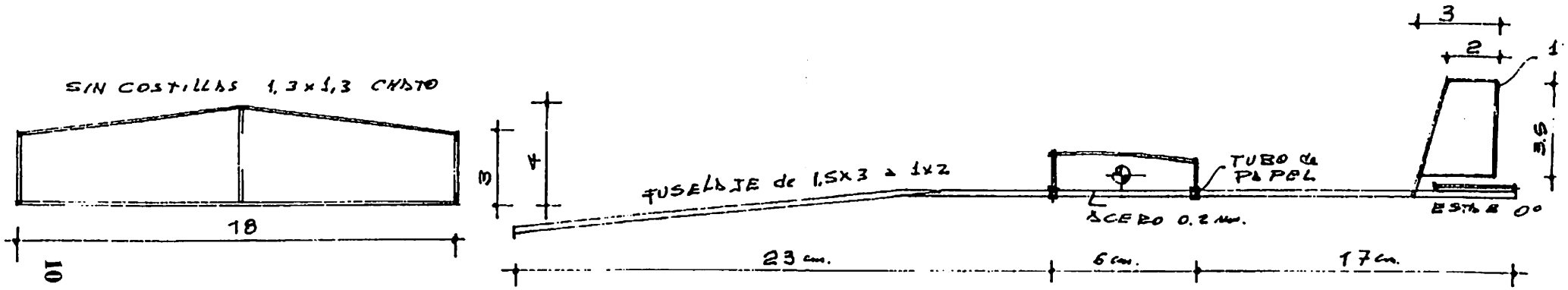
We should now calculate the width/weight ratio
$\frac{6,35 mm}{6,7382 g} = 0,94239 mm/g$. We cut now a strip with the stripper and check the unit weight which could be eg. 2,36 g/m. This unit weight is now multiplicated with the width/weight ratio = 0,94. The width of the strip is 0,94 x 2,36 = 2,22 mm.
The above calculation must be repeated for each new batch of rubber, and also inside each batch
On the enclosed diagram is shown graphically the relation between strip unit weight (g/m) and strip width (mm).The strip width range is for a LRS model.

3. DIAGRAM



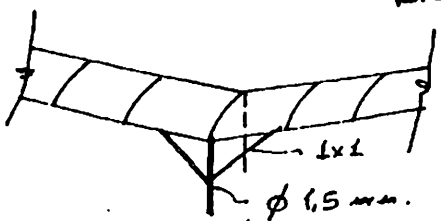
Ref. INAV # 92. Dec.97

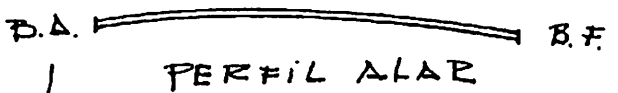






VISTO de ATRAS
GIRO A LA IZQUIERDA





PERFIL ALAR

P.I.R

PESO: 1,5 GRAMOS.

CUANDO DE LA MANO (2.10 m) AL SUELO MARCA 12' COMIENZA A VOLAR BIEN.

REMOLQUE: HILO DE COSER.

Indoor

Spanish Indoor Championships 1997

Report by Daniel Medina

This time the Spanish Indoor Championships took place in Toledo in the last weekend of November.

Saturday 29

Saturday was for training flights and at the end of the day a special promotion competition was held. Antonio Ferrándiz came with an "army" of future aeromodellers, as well as Goyo with their daughter Rocío. Daniel of Málaga brought some ornitópters that flew with a beat of impish wings.

Sunday 30

In comparison to the first day their was less turbulence in the air and the flying conditions were markedly better.. Daniel flew one of the better models and in this hall with a ceiling height of less than 8 m he broke the Spanish record with a flight of more than 11 minutes. The rest of contestants took good notice of the improvements of Daniel and also improved in respect to their performances last year. Fernando Haro, in F1D-B, passed from 4'12" in 1996 to 5'32" in 1997, a result that he without doubt will overcome next year. The same happened with Luís Font in F1D and Fco Javier Ortín in F1D-B all of the club SAF-15. Technically the quality of the models of Daniel were outstanding, all were very near the minimum weight of one gram.

The final result of the competition was two first positions for Daniel in F1D and F1D-B, 2nd place for Luis Font in F1Dand 2nd in F1D-B for Fernando Haro, both of the club SAF-15.

A mishap in the car that transported the team of Albacete reduced the already small participation significantly. The small participation was the handicap that marked the whole competition. At least we proved that there still is a small group of aeromodellers who want to fight for the survival of Indoor flying in Spain.

RESULTS

Class F1D-B

Name	City							Total
1. Daniel Medina Mangas	Málaga	70	**378**	**363**				**751**
2. Fernando Haro Martínez	Alicante	94	**301**	227	292	300	**332**	**632**
3. Mariano Jiménez Ramírez	Toledo	148	170	138	202	**330**	247	577
4. Francisco Ortín Ferriz	Villena	**192**	31	185	74	**192**	181	**384**

Class F1D

Name	City							Total
1. Daniel Medina Mangas	Málaga	**665**	395	455	**564**	148		**1229**
2. Luis Font Bellot	Alicante	121	94	152	191	**193**	**215**	**408**

TROFEO CIUDAD DE TOLEDO

Class Promocion Indoor

Name	City	Total
1. Rocío Martínez Jiménez	Madrid	320
2. Víctor José Jiménez Trejo	Toledo	264
3. Miguel López Jiménez	Toledo	256
4. Luis García Morejón	Toledo	53
5. Carlos Calderón Alcántara	Toledo	45
6. Marta Ferrándiz Lefler	Toledo	38
7. Marco García Tola	Toledo	14

International E-Mail A-6 Contest

Report by Roger Schroeder (USA)

It has been my pleasure to be the contest director for the first A-6 International E-mail contest. This was made possible by the generosity of Del Ogren who maintained the web site and regularly posted the new results. It was an international event with entries from: England, Australia, Finland, Argentina, Japan, and USA.

You are all winners for participating. I believe between 8 and 10 fliers had never built an indoor model before. A lot had never built an A-6 model. The participation by the beginners was especially good, due mostly to the efforts of Don Park a teacher at the Piper Middle School in Kansas City KS. The winner was Andrew Tagliafico at an adjusted time of 415 sec. He was closely followed by John Lenderman at 411 sec. The third man was Akihiro Danjo from Japan with 400 sec. Although Akihiro is confined to a wheel chair, this is apparently not a handicap when it comes to indoor model flying. Well done. The A-6 technology has been advanced greatly by all your efforts.

I believe that A-6 is now established as a low cost, low tech, fun type, competitive indoor event. Where else can you find airplanes that cost less than the admission to a show and still will fly indoor for times of 4 to 7 minutes? Del and I hope that some large club will adopt the A-6 event, encourage competition, and maintain a consistent set of rules.

We have decided that it will be someone else's turn to run the next e-mail A-6 contest; thus, A-6 needs a home to survive. Many have kindly offered suggestions about rule changes. Most were concerned with the tissue covering rule. Gampi paper is the lightest tissue for an A-6 but it is only available from two sources here in the US and it is relatively expensive. Other comments concerned the 1/32 in. dia wire size and Akihiro pointed out that outside the US, wood is in metric sizes of 1, 1.5, 2,3, ect. and that 1/16 sq and 1/32 sheet is not available without sanding to size. To address these concerns, I propose that the following rule changes be made:

1. Add a rule that the minimum model weight without rubber be 1.3 grams.
2. Allow any covering material, plastic, paper, microfilm, ect.
3. Eliminate the wire size rule.
4. For builders where only metric wood sizes are available, 1.5 mm size wood may be substituted for 1/16 wood and 1 mm may be substituted for 1/32 wood.

The important rule is the minimum weight. After that the worry about covering materials, wire sizes, and small variations in wood sizes goes away.

A-6 CONTEST LEADER BOARD:

Contestant's Name	Flight Time	Adjusted Time, Sec.	Date Flown	Ceiling Ht.
1. Andrew Tagliafico	6:40	415	15 Mar 98	47
2. John Lenderman	6:36	411	15 Mar 98	47
3. Akihiro Danjo	6:26	400	14 feb 98	48.36
4. Mark Allison	6:23	398	15 Mar 98	47
5. Lew Gitlow	6:03	378	15 Mar 98	47
6. Emil Schutzel	5:05	334	22 Nov 97	26.5
7. Bill Shailor	5:04	333	6 Feb 98	26.6

These are the six highest adjusted times. Note the time of Andrew Tagiafico at 6:40.

Note: The fudge factor is 2/3 sec per foot of ceiling height difference from 70 ft..

Roger Schroeder rsch@idir.net

NOCAL FF ML Postal Contest

Report by Al Lidberg (USA)

I'm pleased to announce the results of our first NOCAL postal contest.

The turnout was nice; we had the following:
-Indoor; kit/plan stock: 6 entries from 6 flyers
-Indoor; unlimited: 16 entries from 11 flyers
-Indoor; electric: 3 entries from 2 flyers
-Outdoor; kit/plan stock: 2 entries from 2 flyers
-Outdoor; Unlimited: 2 entries from 2 flyers (same 2 guys/flights as kit/plan stock)
-Outdoor; REALLY unlimited - Foam model: 1 entry from 1 guy (added this event as the FAC currently doesn't allow foam airplanes)
-Outdoor; electric: 1 entry from 1 guy

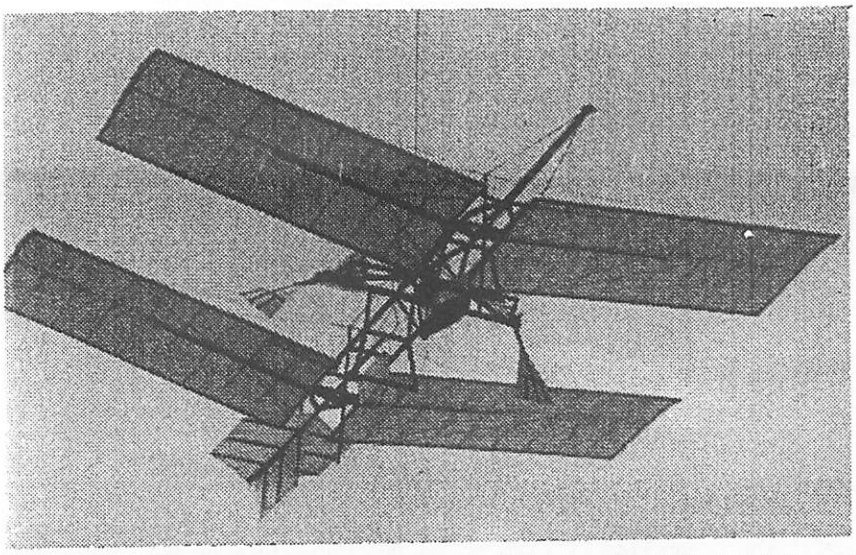
The indoor times were 'corrected' by the fudge factor :
Factor = 627 / (167 + 46 X hsqr), where 'hsqr' is the square root of the ceiling height. This led to an interesting outcome where 1st place in kit/plan stock indoor went to a flyer with a 30' ceiling and 2nd went to a flyer with a 197' ceiling. Be sure to look at the results in Indoor unlimited where 1st (and 2nd) went to a high-celing flyer. Probably will result in some interesting discussions, anyhow.

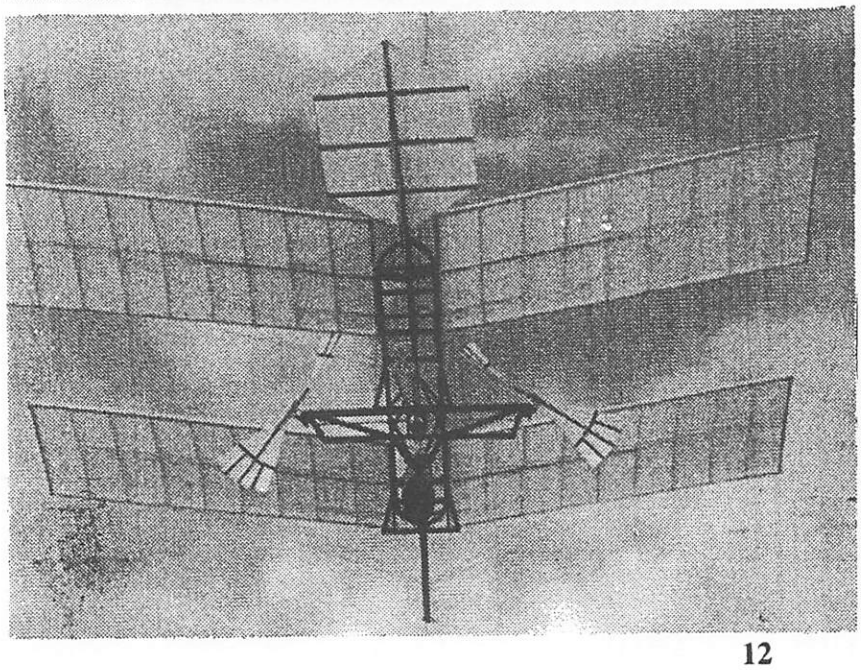
Here are the 1st place results:
-Indoor; kit/plan stock: John Cawthorne, corr score: 420.7
-Indoor; unlimited: Fred Rash, corr score 660.1
-Indoor; electric: John Fleming, corr score 735.5
-Outdoor; kit/plan stock: Gerry Crawmer, 202
-Outdoor; Unlimited: Gerry Crawmer, 202
-Outdoor; REALLY unlimited - Foam model: Jacob Longacre, 160
-Outdoor; electric: John Fleming, 588

There was a nice cross-section of models from a variety of sources/designers, but hard to detect any trends here, except for few folks wanting to fly outdoors in this time frame. Got a good cross-section of locations, too, including Holland and Sweden in addition to many US sites.

Thanks to all who entered - Results are as of 4/4/98, pls check out the complete results at the website: http://members.aol.com/ffmlnocal

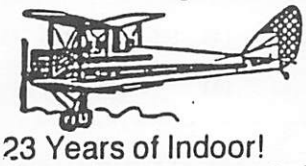
Thanks again - to all who entered or provided support and suggestions to make this idea 'fly' !





Peter Keller (SWI) flew this beautiful twin-rubber powered model of the Samuel Langley 1903 Aerodrome at last years contest in Strepy-Bracquegnies (BEL).
Best flight was 53 seconds

Vol 6 & 7 Here Now!! Lots of stick & tissue plans / how-to! Best of the Hangar Pilot Vol 6 & 7 only $7 ea ppd USA to:



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Provo UT 84601
USA

23 Years of Indoor!

Complete your set: back issues of Vol 1,2,3 $20/set Vol 4,5 $14/set
These contain plans for the best flying models by MIAMA's talented designers!

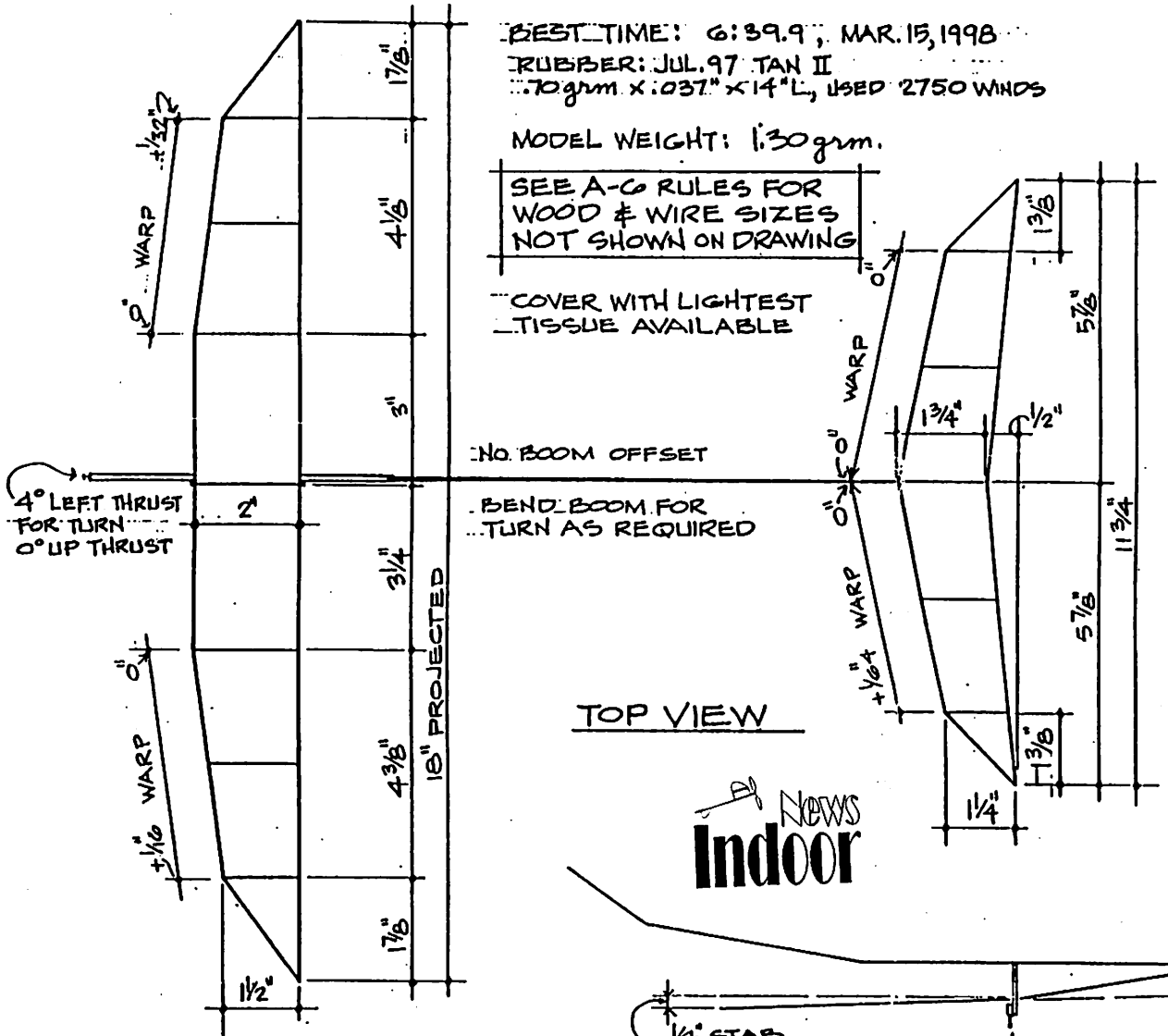
It's NOT just a Calendar !!!
1995 Scale Flyer Calendar contains 14 Planes Worth Modeling, with building plans for contest winners including Swiss 1921 Dornier Falke. Hang in your shop/ build from it!!!
ON SALE only $4 ppd or $3 with any Best of the Hangar Pilot order above!
You tried the rest- now get The Best!
Foreign P & H add $2 / vol for Air Mail UK/Eur

BEST TIME: 6:39.9", MAR. 15, 1998
RUBBER: JUL. 97 TAN II
.70grm x .037" x 14"L, USED 2750 WINDS

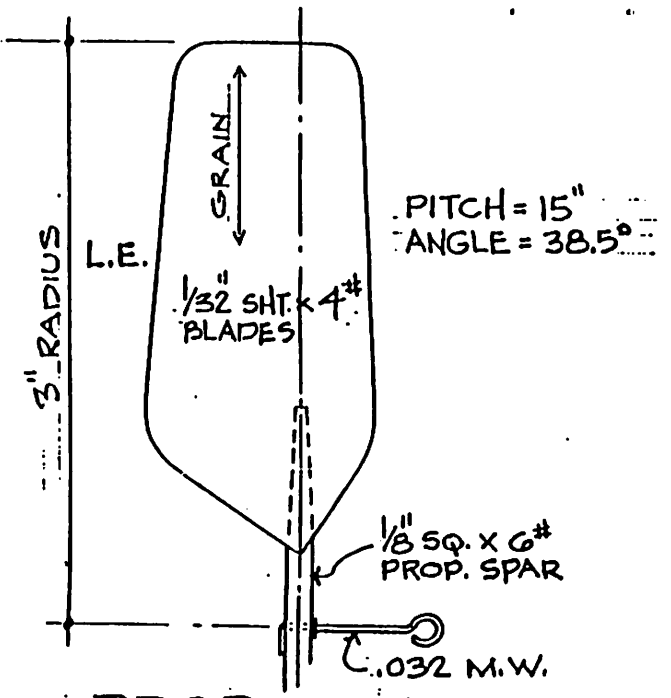
MODEL WEIGHT: 1.30grm.

SEE A-G RULES FOR WOOD & WIRE SIZES NOT SHOWN ON DRAWING

COVER WITH LIGHTEST TISSUE AVAILABLE

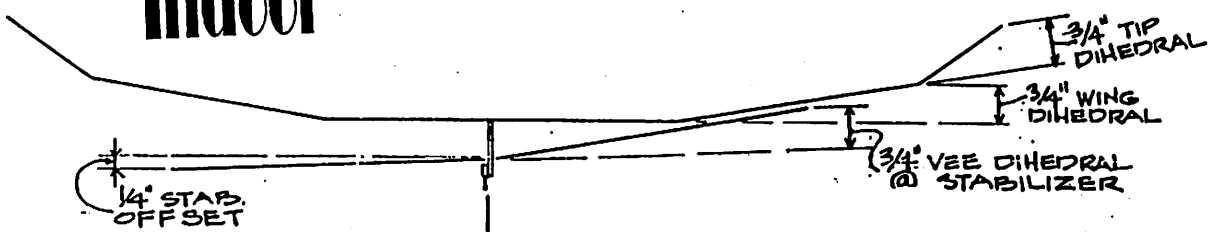


TOP VIEW

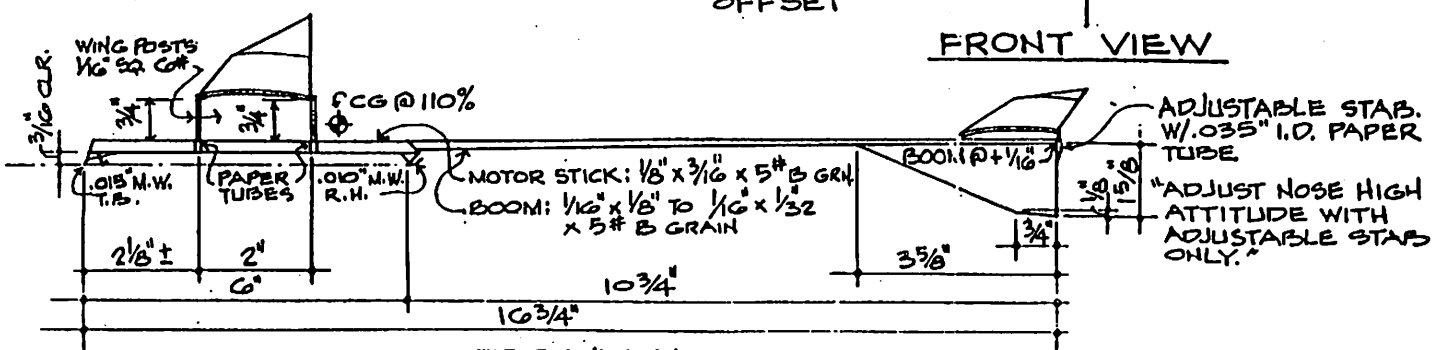


PROP. ° Full Size

AIRFOIL ° Full Size
FOR WING & STAB.



FRONT VIEW



SIDE VIEW

"SLUGGER"

A-G DESIGN BY:
ANDREW TAGLIAFICO

0 1 2 3 4 5 6
SCALE

DRAWN MARCH 22, 1998
AWT

IN MEMORY OF
P.24 ORIGINATOR
TOM HUTCHINSON NFFS

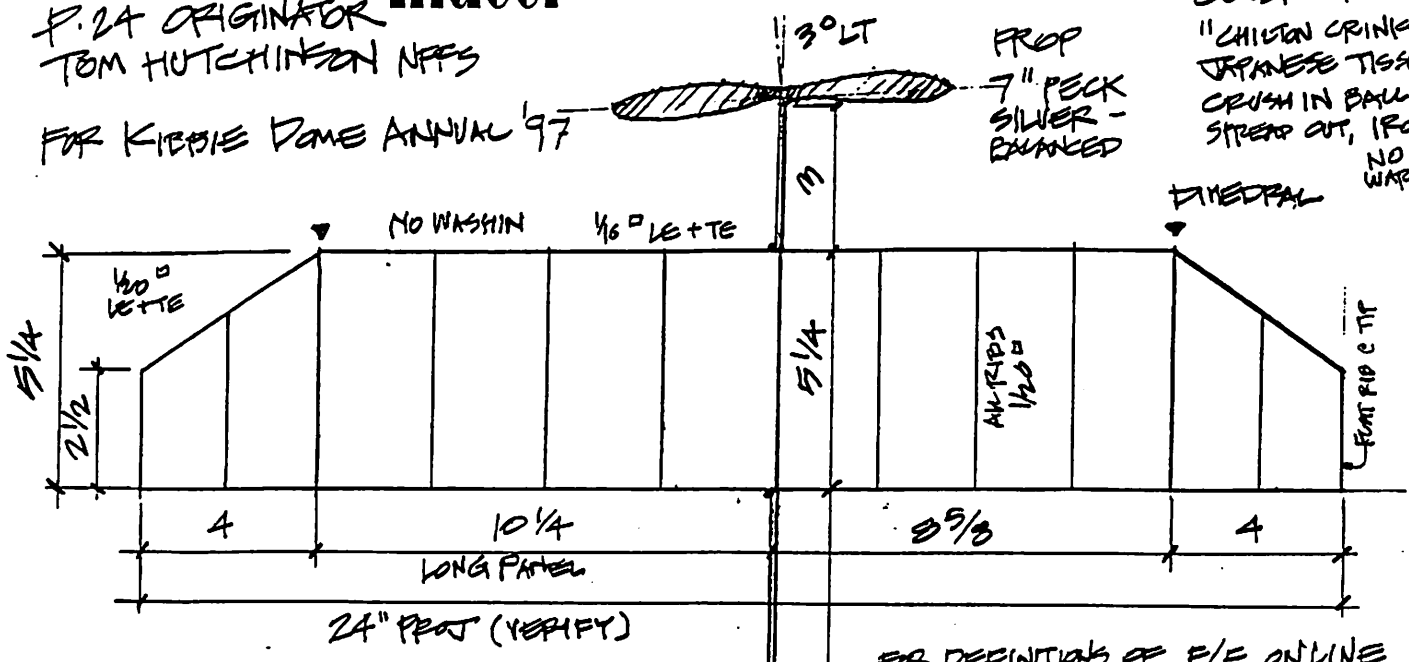
FOR KIBBIE DOME ANNUAL '97

News Indoor

FLY TO LEFT

"POINTY 24" ABANDONED DUE TO INSUFFICIENT AREAS

COVER W/ "CHILTON CRINKLE" JAPANESE TISSUE CRUSH IN BALL, SPREAD OUT, IRON— NO WARPS!

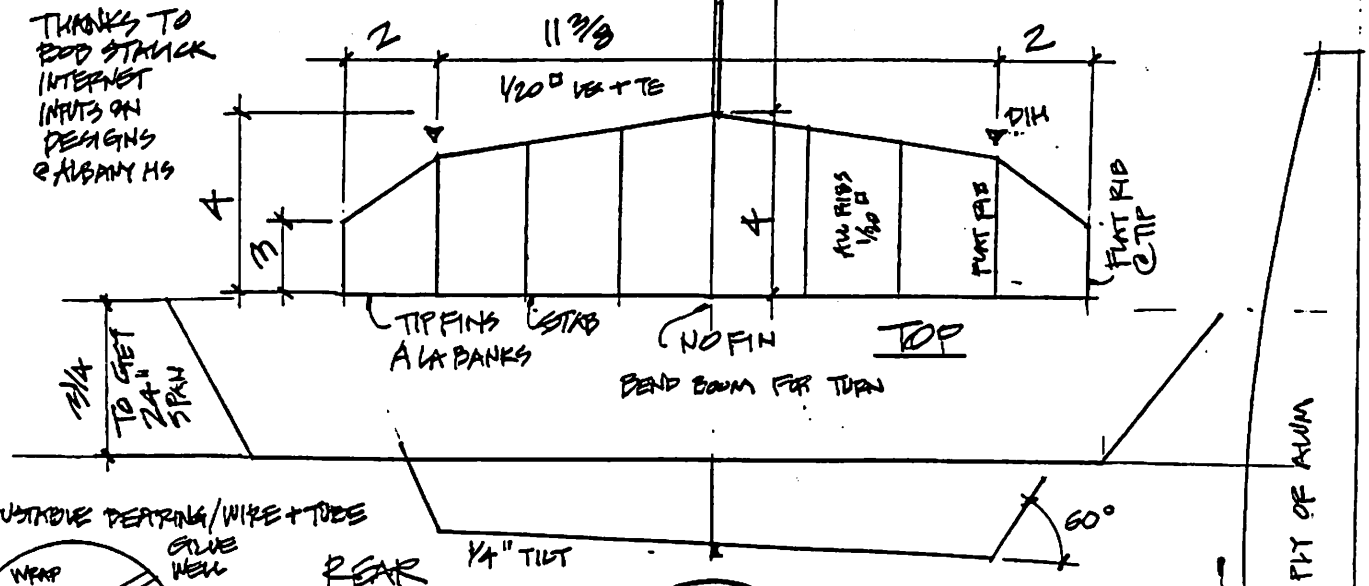


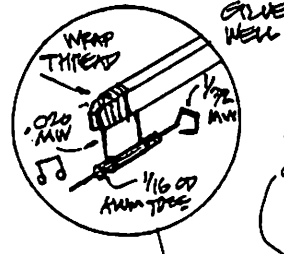
SON OF CYBER-BEAVER P.24

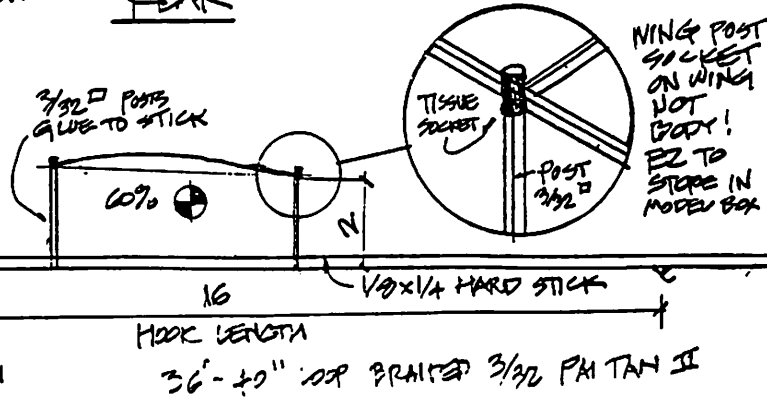
PAVE "VTO" LINSTRUM 7/8/97 WT 10g

FOR DEFINITIONS OF F/F ON LINE "CYBERBEAVERS" / "WDDITES" SEE BILL WARNER F/F SCALE COLUMN AUG 1997 AMA MODEL AVIATION P 115

THANKS TO BOB STALICK INTERNET INPUTS ON DESIGNS @ ALBANY HS



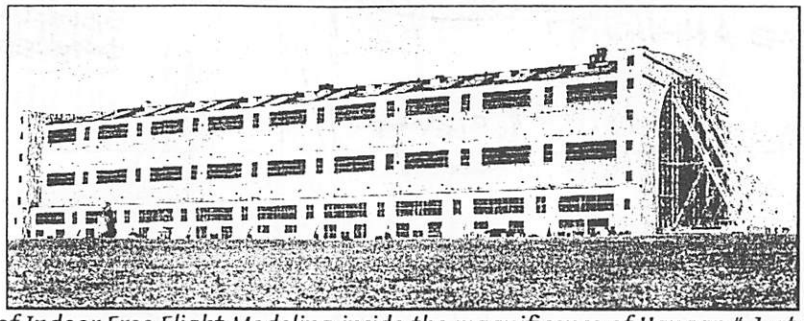




ASSEMBLE W/ THIN DUCO CEMENT

36" ± 0" .008 BRAIDED 3/32 PM TAN II

East Coast Indoor Modelers 1998!



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ECIM is committed to bringing you one of the finest high ceiling sites, more frequently than any other club in the world!

111 AMA Sanctioned Dates

Available every weekend from sun up thru sun down!

Easter Weekend	**April 11, 12, 13**	**Memorial Weekend**	**May 23, 24, 25**
Columbus Weekend	**Oct 10, 11, 12**	**Labor Day Weekend**	**Sept 4, 5, 6, 7**
	Independence Weekend	**July 3, 4, 5, 6**	

- *Our Flying sessions are designed to challenge the most proficient of modelers and to assist new modelers with instructional seminar/apprenticeship programs.*
- *Hangar 1 is available from early morning thru the evening. For those nocturnal flyers, we can even leave the lights on for ya!*
- *ECIM is made up of modelers from every level of experience. Our atmosphere is casual, and we pride ourselves on being a family. We encourage all types of free flying models built for indoors.*
- *If this sounds like the kind of modeling you have been looking for, we would be happy to have you join us!*

1998 ECIM Membership

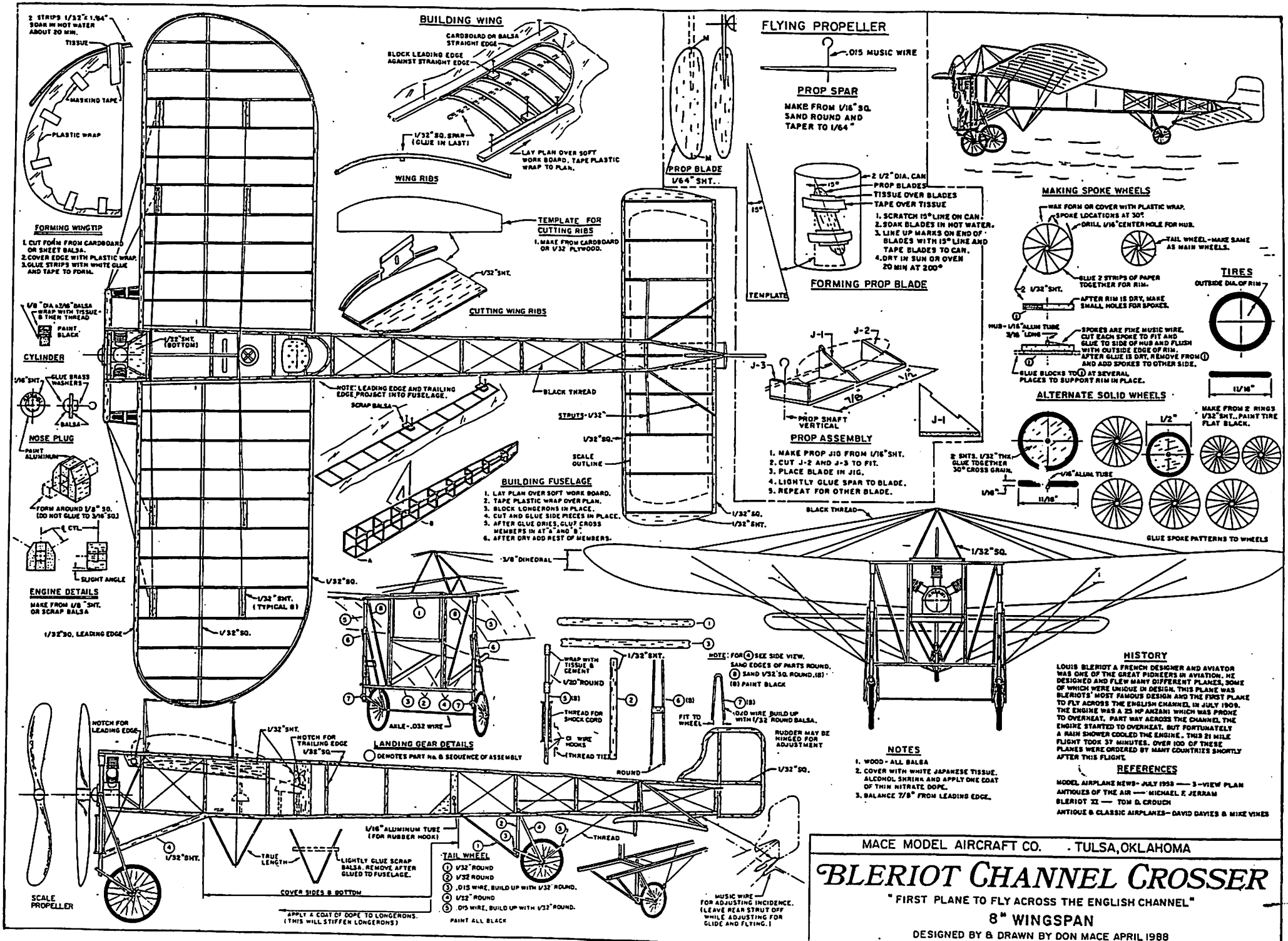
$45 for the year ***Dues are per family*** ***All flyers must have a current AMA membership***

Make checks payable to ECIM

Note New Club Address!

ECIM
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Hopewell NJ 08525

Phone 609 333-0668
Fax 609 333-0669


2 STRIPS 1/32"x 1.84" SOAK IN HOT WATER ABOUT 20 MIN.
TISSUE
MASKING TAPE
PLASTIC WRAP
FORMING WINGTIP
1. CUT FORM FROM CARDBOARD OR SHEET BALSA.
2. COVER EDGE WITH PLASTIC WRAP.
3. GLUE STRIPS WITH WHITE GLUE AND TAPE TO FORM.
1/8" DIA x 3/16" BALSA WRAP WITH TISSUE & THEN THREAD
PAINT BLACK
CYLINDER
1/16" SHT.
GLUE BRASS WASHERS
BALSA
NOSE PLUG
PAINT ALUMINUM
FORM AROUND 1/8" SQ. (DO NOT GLUE TO 3/16" SQ.)
CTL
SLIGHT ANGLE
ENGINE DETAILS
MAKE FROM 1/8" SHT. OR SCRAP BALSA
1/32"SQ. LEADING EDGE
1/32"SHT. (TYPICAL 8)
1/32"SQ.
BUILDING WING
CARDBOARD OR BALSA STRAIGHT EDGE
BLOCK LEADING EDGE AGAINST STRAIGHT EDGE
1/32"SQ. SPAR (GLUE IN LAST)
LAY PLAN OVER SOFT WORK BOARD. TAPE PLASTIC WRAP TO PLAN.
WING RIBS
TEMPLATE FOR CUTTING RIBS
1. MAKE FROM CARDBOARD OR 1/32" PLYWOOD.
1/32"SHT.
CUTTING WING RIBS
1/32"SHT. (BOTTOM)
NOTE: LEADING EDGE AND TRAILING EDGE PROJECT INTO FUSELAGE.
SCRAP BALSA
BLACK THREAD
STRUTS-1/32" 1/32"SQ.
SCALE OUTLINE
BUILDING FUSELAGE
1. LAY PLAN OVER SOFT WORK BOARD.
2. TAPE PLASTIC WRAP OVER PLAN.
3. BLOCK LONGERONS IN PLACE.
4. CUT AND GLUE SIDE PIECES IN PLACE.
5. AFTER GLUE DRIES, GLUE CROSS MEMBERS IN AT "A" AND "B".
6. AFTER DRY ADD REST OF MEMBERS.
1/32"SQ.
1/32"SHT.
3/8" DIHEDRAL
1/32"SQ.
AXLE-.032 WIRE
LANDING GEAR DETAILS
DENOTES PART No. & SEQUENCE OF ASSEMBLY
WRAP WITH TISSUE & CEMENT
1/20" ROUND
THREAD FOR SHOCK CORD
DI WIRE HOOKS
THREAD TIE
1/32"SHT.
NOTE: FOR (4) SEE SIDE VIEW.
SAND EDGES OF PARTS ROUND.
(8) SAND 1/32"SQ. ROUND. (8)
(8) PAINT BLACK
FIT TO WHEEL
.020 WIRE BUILD UP WITH 1/32 ROUND BALSA.
RUDDER MAY BE HINGED FOR ADJUSTMENT
ROUND
1/32"SQ.
NOTCH FOR LEADING EDGE
1/32"SHT.
NOTCH FOR TRAILING EDGE 1/32"SQ.
1/16" ALUMINUM TUBE (FOR RUBBER HOOK)
THREAD
TAIL WHEEL
(1) 1/32" ROUND
(2) 1/32 ROUND
(3) .015 WIRE, BUILD UP WITH 1/32" ROUND.
(4) 1/32" ROUND
(5) .015 WIRE, BUILD UP WITH 1/32" ROUND.
PAINT ALL BLACK
1/32"SHT.
TRUE LENGTH
LIGHTLY GLUE SCRAP BALSA. REMOVE AFTER GLUED TO FUSELAGE.
COVER SIDES & BOTTOM
APPLY A COAT OF DOPE TO LONGERONS. (THIS WILL STIFFEN LONGERONS)
SCALE PROPELLER
MUSIC WIRE FOR ADJUSTING INCIDENCE. (LEAVE REAR STRUT OFF WHILE ADJUSTING FOR GLIDE AND FLYING.)
FLYING PROPELLER
.015 MUSIC WIRE
PROP SPAR
MAKE FROM 1/16" SQ. SAND ROUND AND TAPER TO 1/64"
PROP BLADE 1/64" SHT..
15°
TEMPLATE
2 1/2" DIA. CAN
PROP BLADES
TISSUE OVER BLADES
TAPE OVER TISSUE
1. SCRATCH 15° LINE ON CAN.
2. SOAK BLADES IN HOT WATER.
3. LINE UP MARKS ON END OF BLADES WITH 15° LINE AND TAPE BLADES TO CAN.
4. DRY IN SUN OR OVEN 20 MIN AT 200°
FORMING PROP BLADE
J-1
J-2
J-3
7/8
1/2"
PROP SHAFT VERTICAL
PROP ASSEMBLY
1. MAKE PROP J10 FROM 1/16" SHT.
2. CUT J-2 AND J-3 TO FIT.
3. PLACE BLADE IN JIG.
4. LIGHTLY GLUE SPAR TO BLADE.
5. REPEAT FOR OTHER BLADE.
MAKING SPOKE WHEELS
WAX FORM OR COVER WITH PLASTIC WRAP.
SPOKE LOCATIONS AT 30°
DRILL 1/16" CENTER HOLE FOR HUB.
TAIL WHEEL - MAKE SAME AS MAIN WHEELS.
GLUE 2 STRIPS OF PAPER TOGETHER FOR RIM.
2 1/32"SHT.
AFTER RIM IS DRY, MAKE SMALL HOLES FOR SPOKES.
HUB - 1/16" ALUM TUBE 3/16" LONG
SPOKES ARE FINE MUSIC WIRE. CUT EACH SPOKE TO FIT AND GLUE TO SIDE OF HUB AND FLUSH WITH OUTSIDE EDGE OF RIM. AFTER GLUE IS DRY, REMOVE FROM (1) AND ADD SPOKES TO OTHER SIDE.
GLUE BLOCKS TO (1) AT SEVERAL PLACES TO SUPPORT RIM IN PLACE.
TIRES
OUTSIDE DIA. OF RIM
11/16"
MAKE FROM 2 RINGS 1/32"SHT.. PAINT TIRE FLAT BLACK.
ALTERNATE SOLID WHEELS
2 SHTS. 1/32" THK GLUE TOGETHER 90° CROSS GRAIN.
1/2"
1/16" ALUM TUBE
1/16"
11/16"
GLUE SPOKE PATTERNS TO WHEELS
HISTORY
LOUIS BLERIOT A FRENCH DESIGNER AND AVIATOR WAS ONE OF THE GREAT PIONEERS IN AVIATION. HE DESIGNED AND FLEW MANY DIFFERENT PLANES, SOME OF WHICH WERE UNIQUE IN DESIGN. THIS PLANE WAS BLERIOTS' MOST FAMOUS DESIGN AND THE FIRST PLANE TO FLY ACROSS THE ENGLISH CHANNEL IN JULY 1909. THE ENGINE WAS A 25 HP ANZANI WHICH WAS PRONE TO OVERHEAT. PART WAY ACROSS THE CHANNEL THE ENGINE STARTED TO OVERHEAT. BUT FORTUNATELY A RAIN SHOWER COOLED THE ENGINE. THIS 21 MILE FLIGHT TOOK 37 MINUTES. OVER 100 OF THESE PLANES WERE ORDERED BY MANY COUNTRIES SHORTLY AFTER THIS FLIGHT.
NOTES
1. WOOD - ALL BALSA
2. COVER WITH WHITE JAPANESE TISSUE. ALCOHOL SHRINK AND APPLY ONE COAT OF THIN NITRATE DOPE.
3. BALANCE 7/8" FROM LEADING EDGE.
REFERENCES
MODEL AIRPLANE NEWS- JULY 1953 — 3-VIEW PLAN
ANTIQUES OF THE AIR — MICHAEL E JERRAM
BLERIOT XI — TOM D. CROUCH
ANTIQUE & CLASSIC AIRPLANES — DAVID DAVIES & MIKE VINES
MACE MODEL AIRCRAFT CO. . TULSA, OKLAHOMA
BLERIOT CHANNEL CROSSER
" FIRST PLANE TO FLY ACROSS THE ENGLISH CHANNEL"
8" WINGSPAN
DESIGNED BY & DRAWN BY DON MACE APRIL 1988