

Indoor News





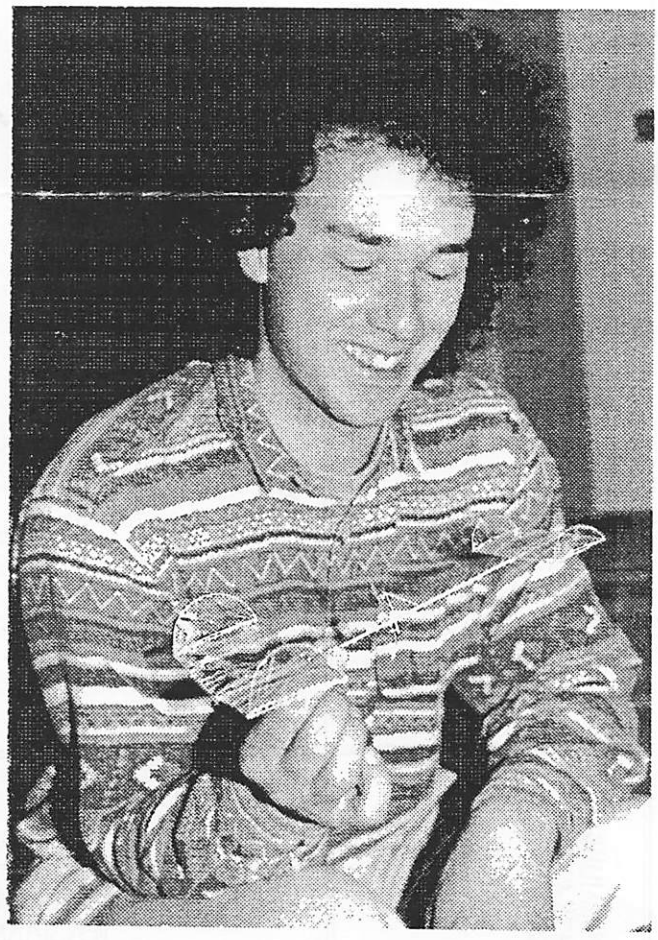
Issue 33 August 1995

DIARY

18-20 Aug Maastricht Netherlands	**Interscale '95**, F4D, F4E, F4F and Pistachio, T. Schippers, P.O.Box 2060, 6201CD Maastricht, Netherlands, Tel. +31.(0)79.212195.
27-28 Aug Cardington England	**British Indoor Nationals**, Index over 2 days, 27th: F1L EZB, LPP, 28th: F1D incl. Team Trials, LRS. **Before** travelling to Cardington contact Laurie Barr, Herries Cottage, Winter Hill Road, Pinkneys Green, Berks. SL6 6PJ, England, Tel. +(0)1628 487544.
26Sep/1 Oct Slanic Romania	**European Championships F1D**, Federatia Romana de Modelism, M. Zanciu, V. Conta 16, Sec 2, Bucarest 70139, Romania, Tel. +40 1 2100161, fax +40 1 2110160
2/3 Oct Slanic Romania	**Euroindoor F1D Open International**, Federatia Romana de Modelism, see above.
Jan-Mar '96	**International Mini-Stick Postal Contest**, Larry Coslick, 4202 Valley Crest Hills Drive, St. Louis, Missouri 63128, U.S.A..

Too small to believe.....!

About a year ago we reported about the smallest CO_2-motor in the world, the 0,75 mm^3 made by Rainer Gaggl from Austria. Well, he excelled himself by producing one with a displacement volume of only 0,12 mm^3!!! This motor has a piston diameter of 0,5 mm and stroke of 0,6 mm. The whole engine is as large (small) as a pin head.... The motor powers a canard Mini-Stick model. Walter Hach made the nice drawing of this model. The model flies for ± 60 seconds on a tank capacity of 0,1 cm^3 at an RPM of ±10.000. The motor is fixed to the model with two-sided tape and the tank is fixed with a dental rubber band.



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.

I can make the drawings, if you are no draftsman. I prefer payment of subscriptions per eight issues. When paying by Eurocheque, International Postal Money Order or with bank notes no additional bank fees are required. Please add NLG 6,50 for bank fees when paying by Eurogiro or NLG 20,00 with foreign checks. The Eurogiro account number is 4406860.

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NL-6537JD Nijmegen
The Netherlands

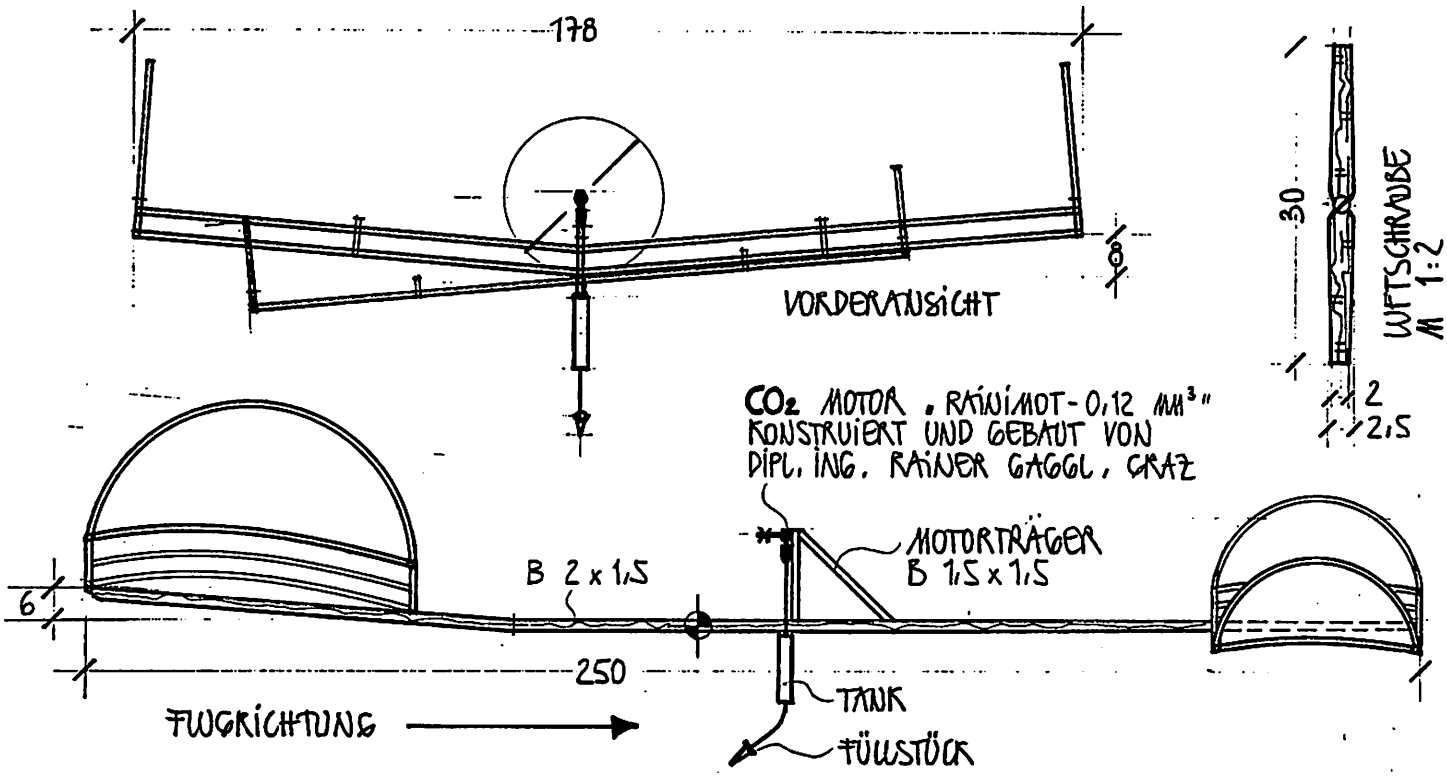
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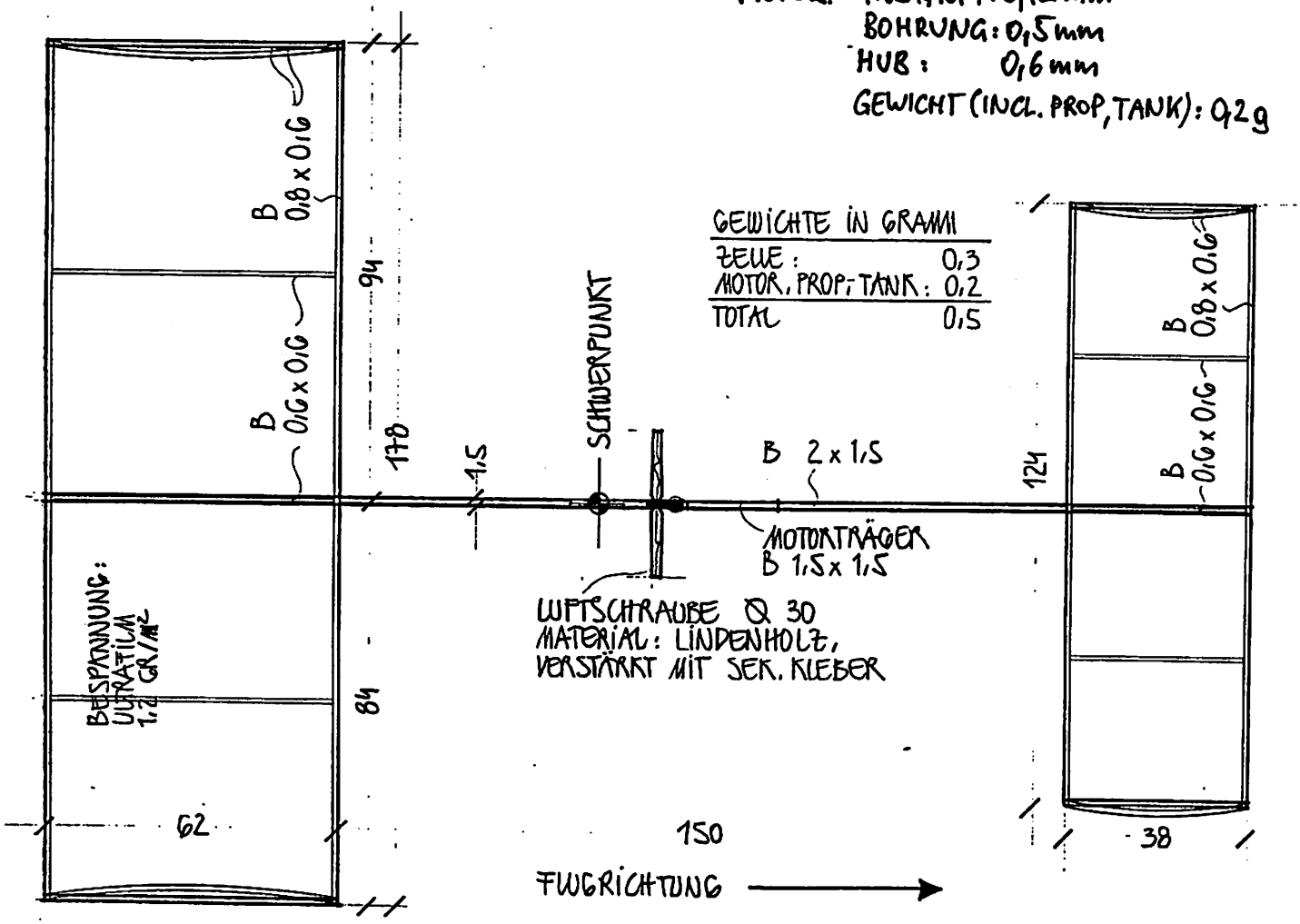
MINI-STICK "CANARD" MIT CO_2 MOTOR

VON DIPL. ING. RAINER GAGGL, A-8020 GRAZ, TRIESTERSTRASSE 69, TEL: 0316/26 14 97

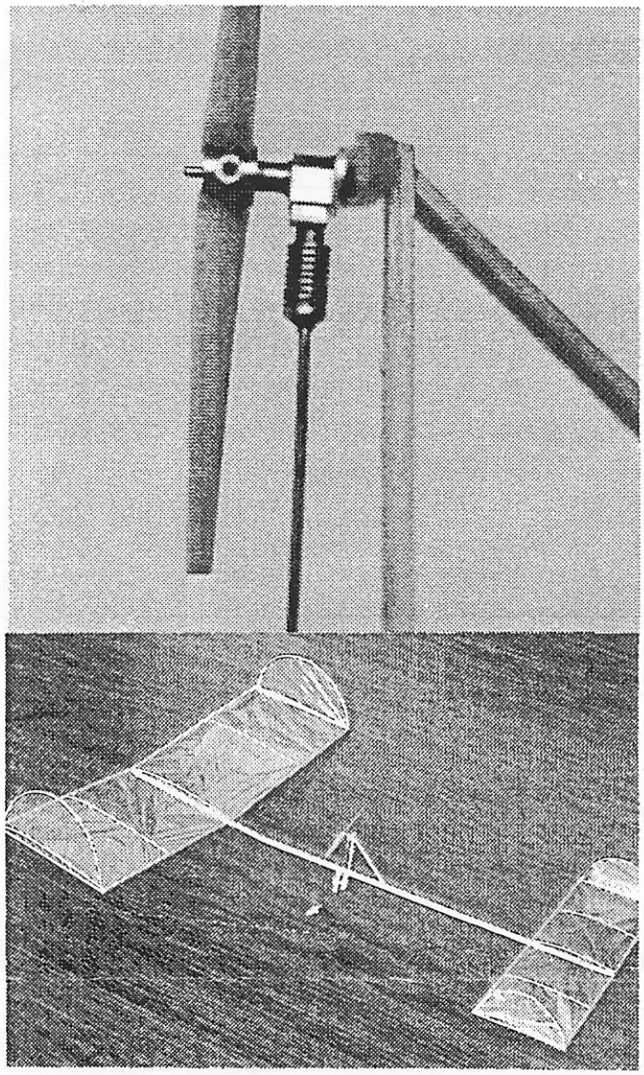
MASSTAB 1:1, 1:2 ALLE MASSE IN MM! GEZEICHNET: W. HACH APRIL 1995



MOTOR: HUBRAUM: 0,12 mm³
BOHRUNG: 0,5 mm
HUB: 0,6 mm
GEWICHT (INCL. PROP, TANK): 0,2 g



GEWICHTE IN GRAMM	
ZELLE:	0,3
MOTOR, PROP, TANK:	0,2
TOTAL	0,5



Rainimot CO_2-motors

Rainer Gaggl has decided to produce a limited number of his "Rainimot 21 mm^{3}" motor. This is the motor he uses in all his Peanut models and F1K duration planes (winner of 1994 Eurotrophy). Technical data are: displacement 21 mm^3, bore 3 mm, stroke 3 mm, weight 4.5 g (incl. tank, without prop), tank capacity 3 cm^3. Price is 1500,- ATS + shipping. Contact: Rainer Gaggl, Triesterstraße 69, A-8020 Graz, Austria. Tel. ++43-(0)316-261497, e-mail: raini@fexphds03.tu-graz.ac.at.

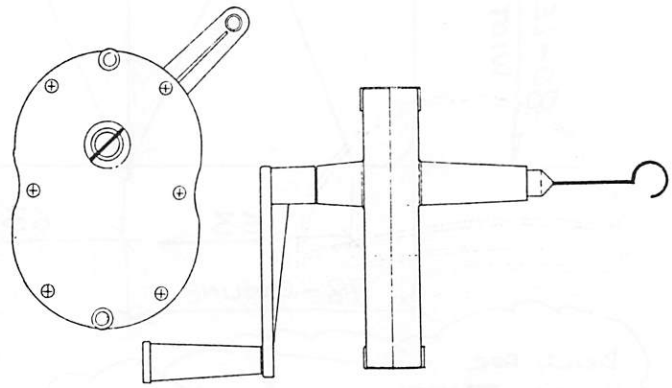
Ornithopters on Internet

Nathan Chronister (editor of Flapper Facts) has set up an ornithopters page on the World Wide Web. It presents a fairly thorough introduction to ornithopters, but it is also a new source of information for the more experienced. The page also includes new information on designing ornithopters (including engine powered models) not found in the Ornithopter Design Manual. You will find several photographs, and there are even some movies of P.H. Spencer's gas powered ornithopters in flight.

The URL is: http://www.bucknell.edu/~chronstr. Nathan's address is: Box C-8315, Bucknell University, Lewisburg, PA 17837, U.S.A..

Indoor Winders

John Tipper is producing a range of indoor winders. These winders are available in 5:1, 10:1 and 15:1. All three winders will wind ¼" loop of rubber to breaking point, so they should cover all aspects of indoor flying. There is a ball bearing thrust race built in and the winding hook is retractable. There are two mounting holes, one top - one bottom, so that counters and bench clips can be securely fixed to the winder. The cost is £9.00, which includes world wide post. Payment can be made by Eurocheque or International Money Order, made out in £ sterling to John Tipper, 23 Green Lane, Chichester, West Sussex, PO19 4NS, England.



Sainte Formule model

by Chris Hutchinson (GB)

I have flown this Sainte Formule model in low ceiling sports halls and at Cardington. We had only two Saint competitions at Cardington, but we hold an index competition at each indoor meeting in addition to a single class event. Any class of model can be flown in the Index competition, and the results are expressed as a percentage of the record time for the appropriate class.

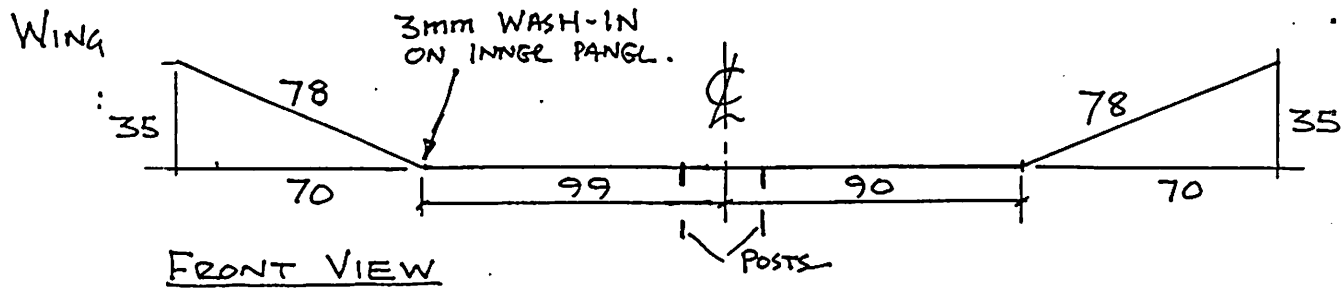
My Sainte design seems to perform quite well without using any exotic in construction, and has done 6 min. 28 sec. at Cardington. I drew the rough sketch/drawing for Mike Green and Brian Roberts who were hoping to go to Liège this year. There is nothing unusual on the drawing, except perhaps where I have indicated a radius at the tail and wing tips, I suggested cutting around our 2 pence coin when making a card template. Our 2 pence coins are 25 mm diameter!

BMFA 1995 INDOOR SCALE NATIONALS

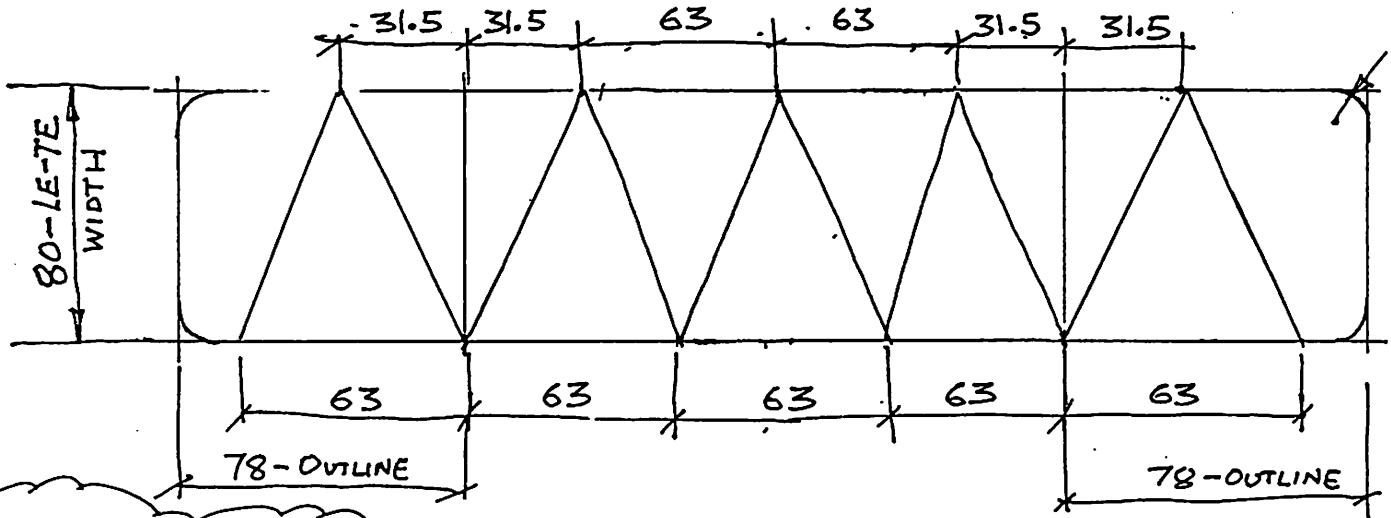
Nottingham, May 7, 1995

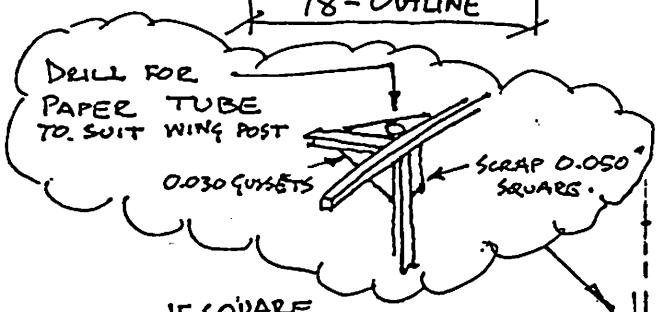
Report by Reg Boor (GB)

From many fine prototypes at a successful 1995 Nationals I shall mention just a few of the models and modellers that are outstanding in their class. The Sopwith Schneider floatplane of Mike Allen has appeared before at events in the UK, but for the first time Mike was able



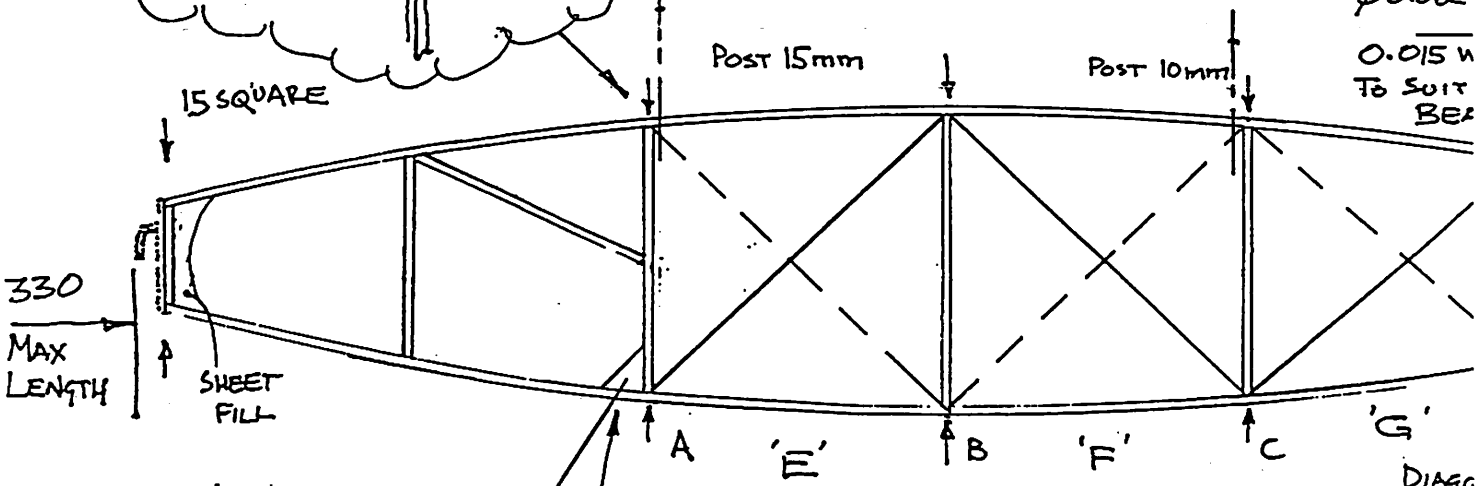
FRONT VIEW





WING SPARS 0.065" x 0.043"
TIPS 0.060" x 0.034"
RIBS 0.065" x 0.032"

PROP
ϕ0.062
0.015 W
TO SUIT
BEA



DIAGO

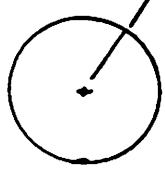
SIDE VIEW
DRAWN TO SCALE

BAMBOO LEG, ϕ0.030" → ϕ0.015" INTO DRILLED GUSSET

ALSO
'E', F

ALL

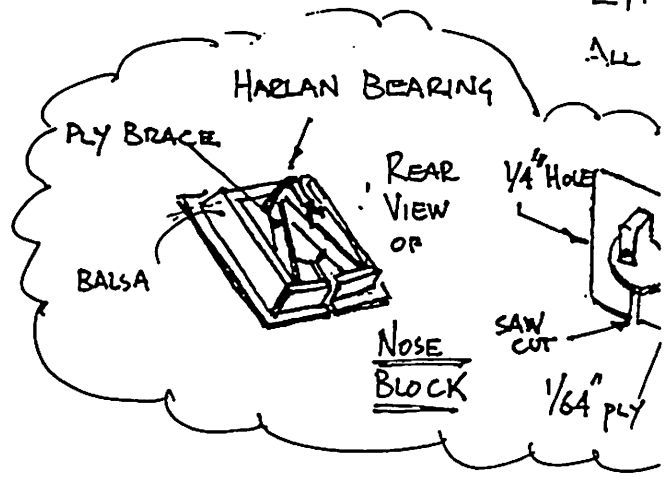
OTHER SCRAP VIEWS AND FORMER DETAILS NOT TO SCALE.



BAMBOO RIM BENT ROUND 1p WITH 3 BALSA SPOKES.

PAPER TUBE OR HYPODERMIC HUB.

100mm D/C



G.31-1-95

UNCOVERED WING	0.10 gm
UNCOVERED TAILPLANE	0.05gm.
FINISHED FUS.	0.72 gm
PROP	0.15 gm
NOSE BLOCK	0.132gm.

SAINT BY CHRIS HUTCHINSON
BEST TIME 6:28, CARDINGTON 29-8-93
FOR RULES SEE AEROMODELLER AUGUST '88

CHECK DIMENSIONS:
MAX LENGTH 330mm EXCLUDING PROP
FUSELAGE TO CONTAIN 3×4×5cm
"WINDOW" 2 sq Cm TOTAL IN ELEVATIONS

TRIM CORNERS
ROUND 2 pence.

News Indoor

WING	330 × 80mm MAX PROJECTED.
TAIL	150 × 60mm
PROP	Ø150 × 25mm CHORD.
U/C	2 LEGS EACH WITH Ø18mm min WHEEL

Enlarge 1.06X

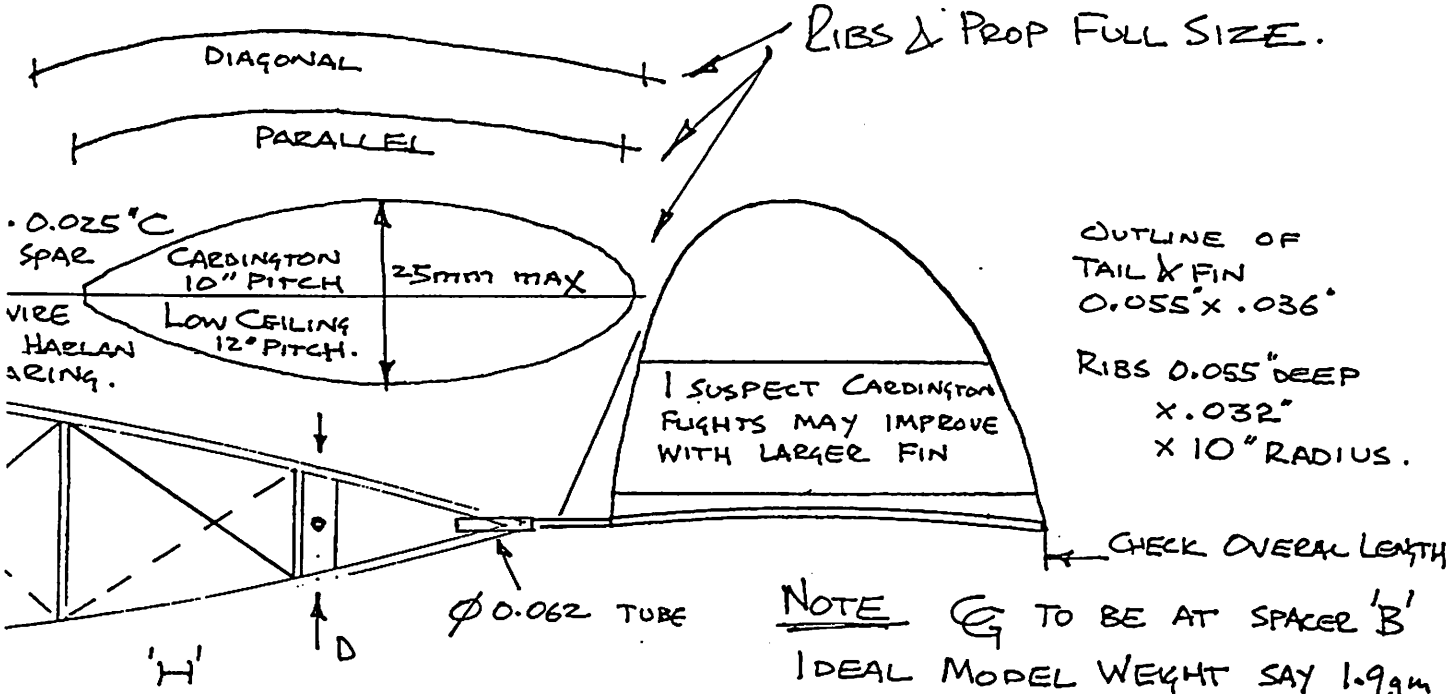
DIMENSIONS OF CARD WING FORMER

	NOSE	A	B	C	D	REAR
FUSELAGE DEPTH	15mm	40	44	40	16	TUBE
WIDTH	15mm	30	33	30	12	TUBE

COVERING "JAN SOMMERS FILM"

LEADING EDGE.

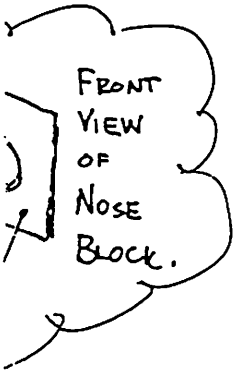
RIBS & PROP FULL SIZE.

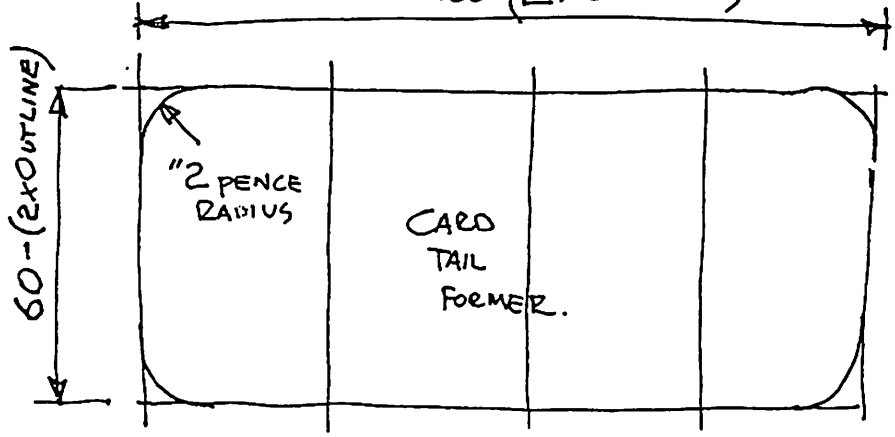


DIAGONAL BRACING FULL LINES = THIS SIDE
DOTTED = FAR SIDE.
BRACE TOP AND BOTTOM IN BAYS 'G' AND 'H'.

FUSELAGE 0.050 BALSA.

NOTE CG TO BE AT SPACER 'B'
IDEAL MODEL WEIGHT SAY 1.9gm
THEN ADD BALLAST TO 2gm
AND ACHIEVING REQUIRED CG.
CG CAN BE MOVED UP TO 4mm BACK.
('B' IS 100mm FROM NOSE WITHOUT NOSE BLOCK.





to make this model take-off and his consequent first place in the Co2/Electric contest was well-deserved, with a good model and superb flying. Mike Goldby's static score for his Bristol Fighter in Co2/Electric was, as last year, high enough to win him a place without the need for a take-off, his single qualifying flight was hand-launched, but the model is built to museum standards with some extremely fine detail and had, amazingly, been repaired after being broken in two some 10 days before. The models built by Ray Johnson flew impeccably, as they always do. The numerous SE5a's of Divs Masters flew in all four contests and were amongst the leaders throughout. Although in the Peanut and Pistachio events they had to share the honours with Harris's Voisin canard floatplanes. I complained about the domination of these two prototypes last year and I should like to see more complexity points for low-wing models to encourage further diversity in Peanut.

Interestingly, it seems that when not in the hands of the experts, the Lacey's and Fike's do not do very well. However, the meeting was notable for a new development. Models constructed from builder's "blue foam" insulation. All of them were rubber-driven and many of them twin-engined. This foam has a very close grain structure and if finished with extremely fine sanding paper can be painted directly without a priming coat. Some modellers use a 50/50 enamel/thinner mixture and some use acrilic paints. The result is a good simulation of the monocoque structure of WW2 fighters and bombers, which is so difficult to achieve with stick and tissue. There must have been at least 15 models at the meeting built using this technique, most of them to about 1/48th scale and all of them very light in weight. In fact, I understand that 1/48th scale plastic kits can be used as templates for the basic foam shapes, there being plenty of decals, canopies and pilots available in this scale. Fuselage halves are temporarily fastened together by means of many tiny squares of double-sided sellotape in order to shape the outside, then the halves are separated and hollowed-out to about 1.5mm thickness. Final assembly takes place using PVA adhesive (white glue). In common with all other foams except Rohacell, blue foam will not accept cellulose or cyano. None of the models that I saw had undercarriages and so had to be hand-launched and all of them had single-surface aerofoils, which might not be liked in the judging process and could cause stiffness problems at a larger size. I discussed this with one of the modellers and he has ideas about a false spar on which to attach an undercarriage. So, in the larger classes at least, there are still problems to be overcome to bring the technique up to competitive standards.

Also, in Peanut, there is no mechanism in the rules for judging the flying surfaces of a foam model, so they tend to score zero under this heading. Nevertheless, three were flown in competition. A Barracuda in Open Rubber, a Tempest in Peanut and a FW 190 in Pistachio. None of them World-beaters yet. But if you like Spitfires, Barracudas, Mosquitoes, Marauders, Junker 88's etc, and models of all of these types were flying at the Nationals, then this could be the way for you.

F4D OPEN RUBBER

		Static	Flight	Total
1. MASTERS D.	SE5a	1006.5	1059	2065.5
2. JOHNSON	PILATUS	752	1146	1898
3. BALL	HENSCHEL	830.5	1050	1880.5
4. HETHERINGTON	CAPRONI	840.5	954	1794.5
5. SMITH	ARADO	604.5	1078	1682.5
6. DIMES	FIKE	602	890	1492
7. REECE	SUPER ACE	537	882	1419
8. BLACKBURN	PUSS MOTH	289	1078	1367
9. MASTERS V.	LACEY	374	944	1318
10 SMART	BARRACUDA	561.5	755	1316.5
11 SKERRETT	TAILWIND	497.5	784	1281.5
12 BATES	VAGABOND	390	804	1194
13 BOOR	FURY	535	596	1131
14 ROBINSON	LOVING LOVE	423	348	771

F4E CO2/ELECTRIC

		Static	Flight	Total
1. ALLEN	SOPWITH	806	1211	2017
2. GOLDBY	BRISTOL F2B	1128	816	1944
3. MASTERS D.	SE5a	1112	726	1838
4. JOHNSON	SCION	598	1012	1610
5. SMART	KALILIN	712	878	1590
6. PALLISTER S.	ARROW	1056	508	1564
7. HOVELL	ANTOINETTE	536	992	1528
8. KNIGHT	AVRO 560	800	686	1486
9. LAWSON	CESSNA	522	750	1272
10 GREEN	ANEC	564	707	1271

F4F PEANUT

		Static		Flight		Total
		Pts	Pos	Sec	Pos	
1. HARRIS	VOISIN	61.5	4	133	3	7
2. MASTERS D.	SE5a	69.5	1	86.6	9	10
3. JOHNSON	CURRIE WOT	49.5	6	88.8	=6	=12
4. PEPPIAT	AERONCA	43.5	10	136.1	2	=12
5. FROSTICK	LACEY	39.5	=13	178	1	14
6. MORGAN	CURRIE WOT	64.5	2	77.5	14	16
7. GOLDBY	PIPER CUB	48.5	7	86	10	17
8. PRIOR	FRED	41	12	88.8	=6	=18
9. BOOR	AVRO 560	39.5	=13	97.4	5	=18
10 BOYS	HAMILTON	38	16	109.5	4	20
11 SMITH	VOISIN	62.5	3	54.5	19	22
12 CROSSLEY	TEMPEST	46	8	74.6	15	23
13 HOVELL	FLY-BABY	51.5	5	33.2	23	=28
14 BEALES	LACEY	38.5	15	79.6	13	=28
15 BATES	BUTTERCUP	42.5	11	55.3	18	29
16 HAVARD	FLY-BABY	45.5	9	47.4	21	=30
17 FIRTH	LACEY	25.5	22	88.6	8	=30
18 MASTERS V.	LACEY	34.5	19	79.8	12	=31
19 LAWSON	BROUSSARD	33	20	85.3	11	=31
20 SMART	BARRACUDA	35	18	51.5	20	=38
21 SKERRETT	TAILWIND	26.5	21	55.6	17	=38
22 PURSGLOVE	HE 46	37.5	17	46.3	22	=39
23 STICHBURY	FARMAN	23.5	23	57.5	16	=39

PISTACHIO

		Static		Flight		Total
		Pts	Pos	Sec	Pos	
1. MASTERS D.	SE5a	68	1	93	=3	4
2. HARRIS	VOISIN	62	2	93	=3	5
3. PEPPIAT	BEERCAT	47	=5	179	1	6
4. KNIGHT	SWIFT	50	4	68	8	=12
5. CROSSLEY	FW 190	47	=5	70	7	=12
6. HANKS	SE5a	56	3	33	10	=13
7. GRIFFITHS D.	HE 46C	33	7	73	6	=13
8. GRIFFITHS A.	HP SAYERS	18	12	141	2	14
9. FIRTH	LACEY	26	=10	86	5	15
10 STICHBURY	SAMOLOT	26	=10	49	9	19
11 DIMES	LACEY	32	8	19	12	=20
12 CHAPMAN	HP SAYERS	29	9	26	11	=20

Living Room Stick Postal Contest 1995

		time	height	points	
1. W. van Gorder	USA	10'48	7.09	1044.99	Overall Champ
2. L. Coslick	USA	7'40	2.73	946.59	1st Int
3. L. Mzik	USA	8'24	6.10	847.85	2nd Int
4. T. Yatabe	JAP	9'12	9.00	830.13	3rd Int
5. J.F.Frugoli	FRA	6'31	2.50	820.68	
6. J. Clem	USA	8'20	7.01	808.81	
7. M. Vanlil	USA	6'48	3.33	801.97	
8. R. Eberle	USA	7'56	6.10	800.74	
9. M. Thomas	CAN	7'28	5.41	778.53	
10. K. Hara	JAP	8'18	7.91	778.12	
11. J. O'Donnell	GBR	6'18	2.74	777.07	1st UK
12. S. Nonaka	JAP	8'35	9.00	774.49	
13. T. Yatabe	JAP	8'31	9.00	768.47	
14. K. Kihara	JAP	8'28	9.00	763.96	
15. Z. Fujiwara	JAP	8'22	9.00	754.94	
16. D. Belieff	USA	7'18	5.67	751.60	
17. Y. Sugi	JAP	8'01	9.00	723.35	
18. T. Vallee	USA	7'01	5.67	722.43	
19. A. Abell	GBR	6'39	2.34	722.00	2nd UK
20. K. Hashimoto	JAP	7'59	9.00	720.35	

A total of 97 entrants posted 299 competitive flights. Flyers from 6 countries (incl. Slovenia!) flew in sites ranging from 18.30 m down to 2.34 m. Prizes will be sent to the Overall Champion and to the top three in international class and U.K. class. Well, that is just about it. Thank you for letting me run this contest for the last five years, it has been FUN!

Thermals forever, even Indoors,

Mike Colling

(The St. Louis Thermaleers will organize the 1996 contest. Details elsewhere in this issue)

Mini-Stick Contest Argentina

Eduardo Grippo from Argentna sent the results of a series of Mini-Stick contests which they held early this year in a 7 meter hall.

	March 4	March 14	March 25
Eduardo Grippo	6'07	5'03	4'40
Alberto Cromberg	5'09	6'38	5'08
Roberto Vaucelle	5'03		
Horacio Angerola	3'15		
Edmundo Cuello		6'42	6'03
Santiago Cardona			4'57

PM2L-New Covering Material

PM2L is a super thin plastic material that can be applied to frames and hoops with spray adhesive such as 3M's Spray 77 or Elmer's SAF*T CONTACT CEMENT, thinned one part cement to ten parts water. Thinned contact cement permits the use of a razor blade for trimming the excess film after drying for at least 6 hours. The usual method of trimming with a pencil soldering iron may also be used if preferred.

Covering can be accomplished with PM2L as received or crinkled and re-stretched. Loose film at dihedral joints can be tightened by applying water on top of the film using a fine brush, much in the same way as handling microfilm. This material can also be used for patching holes in microfilm with the usual atomized water spray.

The weight loss factor (approx. 2/1) of using PM2L vs. microfilm is a deterrent but dimensional stability, puncture and shock resistance are much better, all of which would minimize problems of shipping and handling models.

Specifications

	Weight oz./100sq.in.	Weight g/m^2	Thickness inches	Thickness μm
Harlan Ultra Film	.0045	1,98	.00006	1,5
Trivin Ultimate	.00366	1,61	.000047	1,2
PM2L	.00271	1,20	.0000353	0,9
Microfilm	.0015	0,66	Varies	

(weights determined using a Harlan beam scale. Weight of microfilm varies depending on sheet color after pouring.)

PM2L costs $15.00/15ft. post paid USA. Overseas readers ask for quotation. PM2L is available from R.W. Obarski, 2112 N. Halcyon Dr., Sun City Center, FL 33573, U.S.A..

Corrections to the dictionary

Jean-Francis Frugoli has made corrections to the complete dictionary now. I could have incorporated them earlier if it were not for the mail to take two months to get our letters back and forth! Here are the corrections to the pages in the last issue:

Tailler should be: Découper
Nervure central: Nervure centrale
Empennage: Gouverne
Piquer: Piqucur
Lisse: Brillant
Planeur Lancée Main: Planeur Lancé Main
Voi d'Intérieure: Vol d'Intérieur
Fixture: Fixation
Atterir: Atterrissage
Train d'atterissage: Train d'atterrissage
Borde d'attaque: Bord d'attaque
Largeur: has to be omitted

Tillamook blimp hanger

New Indoor Site —

Keith Varnau and Andrew Tagliafico have arranged the use of an old blimp hanger in Tillamook, Oregon, for indoor flying and will hold FID team qualifications there May 6 & 7. According to Andrew, the hanger is bigger than the Kibbie Dome and is a world class site.

"The hanger is now a museum and the museum people are anxious to have us come and fly there to help them attract more visitors," he explained.

The use of the hanger was arranged by Keith, who stopped in and talked to the staff when he was on a short holiday in that area. Then Andrew and John Lenderman went down and flew spending most of the day sending F1D's and EZBs aloft. They found the air to be very good.

"The temperature remained at 50 degrees all day," Andrew said. "When I told that to Bob Randolph he said it would be good training site for the salt mine in Romania."

Tillamook is 70 miles or so west of Portland, and is a major tourist location. Keith said that while the Kibbie Dome site is probably marginally better, the Tillamook area offers a lot more things of interest for wives and families.

UNITED STATES INDOOR CHAMPIONSHIPS

Johnson City, May 31-June 1,2,3,4, 1995

1995 USIC GRAND CHAMPION

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CONTESTANT	201 HL STICK	202 INT STICK	203 FIO	204 ROG CABIN	205 MANH CABIN	206 EZB	207 PP	208 LPP	212 HLG	215 BOSTON	218 CAT GLID STND	505 PNUT SCALE	507 AMA SCALE	CHAMP POINTS
49 J McGillivray			100			92.9	84.3	100				90.4	100	567.6
74 Ron Ganser		73.9		52.9	75.4			87.5			76.0	100	98.8	564.5
64 M Thompson	62.1	59.7				84.8		95.0	85.1		100	77.0		563.7
104 L Barr	82.9	82.0	76.9		82.5	88.4		81.3						494.1
110 J Koptonak		65.0			66.4			78.8	64.8		74.8	57.0	72.4	479.2
57 Bernard Hunt		100	89.6			96.0	84.4	91.2						461.2

1995 USIC (45) ----------EZB- #206----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	CHAMP POINTS
01 Larry Coslick	4652	21:55	24:51	27:01	-	-	27:01	1	100
57 Bernard Hunt	SMAE56209	21:16	23:15	25:57	-	-	25:57	2	96.0
50 L Cailliau	79985	12:04	18:56	24:51	23:59	25:34	25:34	3	
104 L Barr	ENG	11:00	16:27	23:54	25:25	05:46	25:25	4	
49 J McGillivray	MAAC 1025L	22:00	25:06	24:57	-	-	25:06	5	92.9
19 W Van Gorder	19912	21:59	23:50	04:13	22:33	-	23:50	6	
64 M Thompson	1484	19:57	22:55	21:47	21:38	-	22:55	7	84.8
68 J Lenderman	879	20:40	22:50	17:48	-	-	22:50	8	

1995 USIC (38) ----------PENNY PLANE #207----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
23 Dan O'Grady	MAAC 6192	15:40	16:38	17:04	-	-	17:04	1	100
76 Phil Hartman	8667	16:04	16:56	14:36	-	-	16:56	2	
42 Gord Wisniewski	716	16:33	16:51	04:35	-	-	16:51	3	
53 Jim Clem	L-55	05:47	16:51	12:47	15:01	15:45	16:51	4	
98 Larry Loucka	1210	14:06	15:05	15:30	16:26	-	16:26	5	
15 Jim Grant	159477	14:20	14:43	15:57	16:11	07:13	16:11	6	94.8
68 J Lenderman	879	15:21	14:02	15:52	15:21	15:29	15:52	7	
32 P Olshefsky	MAAC 864L	15:08	12:34	09:36	15:52	13:37	15:52	8	

1995 USIC (41) ----------MINI STICK----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE
104 L Barr	ENG	08:30	08:15	07:34	11:51	12:33	12:33	1
50 L Cailliau	79985	11:55	12:30	-	-	-	12:30	2
57 Bernard Hunt	SMAE56209	09:58	09:00	11:48	04:48	-	11:48	3
46 Bob Eberele	4117	09:26	08:15	11:45	07:20	-	11:45	4
80 W Miller	742	09:30	11:40	10:35	-	-	11:40	5
68 J Lenderman	879	11:32	11:13	11:25	-	-	11:32	6
120 Mark Vancil	124866	-	11:07	-	-	-	11:07	7
77 A Tagliafico	5533	11:06	-	-	-	-	11:06	8

1995 USIC (59) ---------LIMITED PENNY PLANE #208----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
49 J McGillivray	MAAC 1025L	14:14	14:39	14:43	05:51	15:23	15:23	1	100
19 W Van Gorder	19912	14:58	11:16	14:19	14:09	-	14:58	2	
83 John Marett	MAAC 651L	13:47	14:56	-	-	-	14:56	3	
41 Rob Romash	130061	12:43	14:15	14:43	13:00	14:50	14:50	4	96.4
53 Jim Clem	L-55	14:39	14:46	05:53	13:55	-	14:46	5	
64 M Thompson	1484	14:05	14:23	14:37	14:22	13:52	14:37	6	95.0
98 Larry Loucka	1210	14:02	14:29	14:14	13:44	-	14:29	7	
68 J Lenderman	879	13:45	03:17	14:01	14:17	02:27	14:17	8	

1995 USIC (15) ----------UNL CATAPULT GLIDER #219----------

CONTESTANT	AMA #	1	2	3	4	5	6	7	8	9	BEST FLT	2nd FLT	TOTAL BEST 2	PLACE	GRAND CHAMP POINTS
64 M Thompson	1484	81.1	76.9	78.4	75.7	75.9	82.3	83.1	83.1	82.4	83.1	83.1	166.2	1	100
62 Robert Warmann	18748	48.4	56.7	52.2	71.9	67.6	80.0	73.8	82.7	83.0	83.0	82.7	165.7	2	99.7
71 Jim Buxton	75154	77.3	80.0	78.8	81.3	81.7	61.0	--	-	-	81.7	81.3	163.0	3	98.1

1995 USIC (22) ----------STND CAT GLIDER- #218----------

CONTESTANT	AMA #	1	2	3	4	5	6	7	8	9	BEST FLT	2nd FLT	TOTAL BEST 2	PLACE	GRAND CHAMP POINTS
64 M Thompson	1484	72.6	81.5	78.3	83.0	77.3	76.5	80.4	76.5	82.2	83.0	82.2	165.2	1	100
14 Ralph Schlarb	322352	79.3	78.9	74.0	73.1	69.0	78.1				79.3	78.9	158.2	2	95.8
13 W Schlrb	14425	75.6	73.9	0.59	0.61	78.4	77.4	-	-	-	78.8	77.4	156.2	3	94.5
44 K Van Bueren	51477	71.6	73.1	72.3	70.7	69.6	73.6	69.6	76.5	73.4	76.5	73.6	150.1	4	90.9
117 Dan Belieff	12816	52.0	55.0	10.0	74.1	65.3	66.7	64.0	68.2	74.4	74.4	74.1	148.5	5	89.9

1995 USIC (8) ----------FAI INDOOR(F1D)#203----------

CONTESTANT	AMA#	1	2	3	4	5	6	BEST FLT	2nd FLT	TOTAL BEST 2	PLACE	USA TEAM REGIONAL POINTS	GRAND CHAMP POINTS
49 J McGillivray	MAAC 1025L	30:27	43:50	43:59	-	-	-	43:59	43:50	01:27:49	1		100
98 Larry Loucka	1210	31:32	32:15	39:32	39:43	-	-	39:43	39:32	01:19:15	2		90.2
57 Bernard Hunt	SMAE56209	37:48	40:00	38:42	-	-	-	40:00	38:42	01:18:42	3		89.6

USIC 1995 (24) ----------BOSTONIAN-#215----------

CONTESTANT	AMA#	1	2	3	4	5	FLIGHT	FIGHT	BEST 2	CHARISMA	TOTAL	PLACE
69 D Aronstein	97976	05:19	05:34	-	-	-	05:34	05:19	653	1.15	750.95	1
64 M Thompson	1484	04:17	04:47	04:36	-	-	04:47	04:36	563	1.19	669.97	2
01 Larry Coslick	4652	04:25	04:39	04:32	-	-	04:39	04:32	551	1.16	650.18	3
15 Jim Grant	159477	03:32	03:27	-	04:30	04:51	04:51	04:30	561	1.15	645.15	4
34 Joseph Nuszer	29036	03:26	04:20	04:26	04.02	-	04:26	04:20	526	1.15	604.90	5

1995 USIC (3) -------- LIMITED PENNY PLANE #208 , (JR-SR) ---------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
108 Vlad Linardic	MAAC 38165J	13:47	15:53	-	-	-	15:53	1	
45 Rob Eberele	411592	12:10	12:27	11:22	08:53	-	12:27	2	80.9
106 Nick Leonard Jr ?		09:32	08:53	08:05	09:28	06:50	09:32	3	

1995 USIC (2) ----------EZB- #206--(Jr-Sr)---------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE
108 Vlad Linardic	MAAC 38165J	01:38	20:51	22:56	24:08	-	24:08	1
45 Rob Eberele	411592	09:32	13:50	18:13	16:43	-	18:13	2

1995 USIC (4) ----------35CM----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
18 Tom Sova	473169	19:11	18:02	18:27	13:57	17:02	19:11	1	100
41 Rob Romash	130061	15:00	16:31	12:42	-	-	16:31	2	86.1
34 Joseph Nuszer	29036	12:06	16:23	13:14	12:28	-	16:23	3	85.4

1995 USIC (4) ----------AUTOGYRO #211----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE
74 Ron Ganser	7532	12:46	12:32	12:01	-	-	12:46	1
79 John Diebolt	97262	09:20	11:20	-	-	-	11:20	2
93 Fred Rash	63458	02:50	03:38	05:09	-	-	05:09	3

1995 USIC (4) ----------ORNITHOPTER #210----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
36 Ray Harlan	131	17:24	05:25	18:13	-	-	18:13	1	100
01 L Coslick	4652	06:31	09:58	10:41	12:44	-	12:44	2	69.8
58 R Stonecipher	372732	01:55	02:33	01:45	-	05:47	05:47	3	31.7

1995 USIC (4) ----------HELICOPTER #209----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
01 Larry Coslick	4652	09:35	-	-	-		09:35	1	100
41 Rob Romash	130061	07:08	-	-	-	-	07:08	2	73
79 John Diebolt	97263	00:00	00:00	03:58	02:18	05:30	05:30	3	57.4

1995 USIC (18) ----------INTERMEDIATE STICK #202----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
57 Bernard Hunt	SMAE56209	36:08	38:06	-	-	-	38:06	1	100
01 L Coslick	4652	33:25	37:29	-	-	-	37:29	2	98.4
15 Jim Grant	159477	24:03	29:16	32:11	27:37	34:09	34:09	3	89.6

1994 USIC (9) --------HAND LAUNCHED STICK #201----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
57 Bernard Hunt	SMAE56209	41:07	46:14	-	-	-	46:14	1	100
101 Richard Doig	5392	37:25	20:35	41:31	19:38	-	41:31	2	89.8
104 L Barr	ENG	37:08	38:19	-	-	-	38:19	3	82.9

1995 USIC (3) ----------HAND LAUNCHED GLIDER- #212 (Jr-Sr)----------

CONTESTANT	AMA #	1	2	3	4	5	6	7	8	9	BEST FLT	2nd FLT	TOTAL BEST 2	PLACE	GRAND CHAMP POINTS
99 Chris Sydor	280169	44.0	43.0	57.0	46.0	50.3	42.5	52.8	49.2	40.0	57.0	52.8	109.8	1	
45 Rob Eberele	411592	40.8	50.2	46.3	50.0	43.2	51.9	57.0	50.1	18.3	57.0	51.9	108.9	2	
118 Scott Schriver	459504	44.0	43.0	57.0	46.0	50.3	42.5	52.8	49.2	40.0	57.0	52.8	109.8	3	

1995 USIC (7) ----------HAND LAUNCHED GLIDER- #212 (OPEN)----------

CONTESTANT	AMA #	1	2	3	4	5	6	7	8	9	BEST FLT	2nd FLT	TOTAL BEST 2	PLACE	GRAND CHAMP POINTS
71 Jim Buxton	75154	70.8	75.0	73.6	68.4	71.1	74.2	-	-	-	75.0	74.2	149.2	1	100.0
29 Bernie Boehm	92567	67.0	71.3	73.1	72.0	70.0	75.3	69.6	70.3	71.5	75.3	73.1	148.4	2	99.4
64 M Thompson	1484	62.0	65.0	61.0	-	-	-	-	-	-	65.0	62.0	127.0	3	85.1

1995 USIC (14) ----------MAN CAB #205----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
15 Jim Grant	159477	11:09	11:45	13:17	-	-	13:17	1	100
83 John Marett	MAAC 651L	09:10	09:18	09:53	11:36	12:35	12:35	2	94.7
19 W Van Gorder	19912	12:29	12:29	-	-	-	12:29	3	94.0

1995 USIC (3) ----------ROG CABIN #204----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE	GRAND CHAMP POINTS
98 Larry Loucka	1210	15:05	22:09	21:46	27:30	-	27:30	1	
74 Ron Ganser	7532	14:33	-	-	-	-	14:33	2	
117 Dan Belieff	?	12:20	-	-	-	-	12:20	3	

1995 USIC (21) ----------NO-CAL SCALE----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE
98 Larry Loucka	1210	7:03	7:05	7:44	8:02	-	8:02	1
62 Robert Warmann	18748	6:44	6:06	6:41	2:09	7:20	7:20	2
34 Joseph Nuszer	29036	6:03	6:21	4:51	6:45	-	6:45	3
41 Rob Romash	130061	5:24	5:28	2:44	5:35	-	5:35	4
21 Dick Oberski	560	5:01	5:01	3:27	5:27	5:21	5:27	5

1995 USIC (2) ---------- UNLIMITED SPEE----------

CONTESTANT	AMA#	1	2	3	4	5	6	7	BEST MPH	PLACE
01 Larry Coslick	4652	6.0	-	-	-	-	-	-	14.26	1
114 Greg Kroi	514743	7.03	6.69	-		-	-	-	12.8	2

1995 USIC (5) ----------PRO20----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE
49 J McGillivray	MAAC1025L	28:09	-	-	-	-	28:09	1
77 A Tagliafico	5533	23:35	27:31	23:28	07:14	-	27:31	2
18 Tom Sova	473169	21:59	20:23	18:00	13:42	24:42	24:42	3

1995 USIC ---------- F4C SCALE----------

(14)

CONTESTANT	AMA#	MODEL	1st FLIGHT	2nd FLIGHT	3rd FLIGHT	BEST FLIGHT POINTS	SCALE SCORE	TOTAL SCORE	PLACE
16 Jim Miller	89382	Voisin Hydro	1:15	1:27	-	73.5	87	160.5	1
49 J McGillivray	MAAC 1025L	SE-5	1:47	2:04	-	82.5	76.5	159	2
12 Dave Rees	33928	Nicholas Beasely	2:07	-	-	82.5	66.5	149.0	3

1995 USIC ---------- PISTACHIO SCALE ----------

(10)

CONTESTANT	AMA#	SUBJECT	1	2	3	4	5	6	7	8	9	TOTAL BEST 2	FLIGHT POINTS	STATIC POINTS	TOT	PLACE
09 Dr.John Martin	712	Goldwing	1:18	47.6	1:15	-	-	-	-	-	-	2:33	1	5	6	1
52 D Brimmer	1097	Citabria	54.0	1:00	46.0	53.9	38.0	1:03	53.9	1:00	57.9	2:03	4	3	7	2
12 Dave Rees	33928	Lacey M-10	45.0	52.0	1:07	59.0	-	-	-	-	-	2:06	3	5	8	3

1995 USIC ----------PEANUT SCALE----------

(19)

CONESTANT	SUBJECT	1	2	3	4	5	6	7	8	9	SCALE SCORE	BEST FLIGHT	BEST MAX	2nd FLIGHT	2nd MAX	AVE BEST 2	SCALE AVE OF BEST 2	PLACE
Ron Ganser	Voison Hydro	78.0	82.0	153	112	-	-	-	100	-	118.35	153	118.3	112	112	115.7	233.53	1
J McGillivray	Isaac's Fury	85.0	101.0	113	-	-	-	-	90.4	-	107.18	113	107.18	101	101	104.09	211.27	2
M Thompson	1935 Farman	114	99.09	-	-	-	-	-	77.0	-	90	114	90	99.09	90	90	180	3
W Passarelli	PAMA	86.0	121	-	-	-	-	-	-	-	85.5	86.0	85.5	81	81	83.25	168.75	4
Jim Grant	Gipsy Moth	59.7	50.8	58.2	-	-	-	-	-	-	102.15	60.8	-	59.7	-	60.25	162.4	5

1995 USIC ---------- AMA SCALE -#507----------

(7)

CONTESTANT	AMA#	SUBJECT	1	2	4	5	BEST FLIGHT	2nd FLIGHT	AVERAGE BEST 2	SCALE POINTS	TOTAL POINTS	PLACE
49 J McGillivray	MAAC 1025L	SE5 Replica	126	114	-	-	126	114	90	97.7	187.7	1
74 Ron Ganser	7532	1911 Cessna	99	114	-	-	114	99	90	97.5	187.5	2
16 Jim Miller		Voisin	95	95	-	-	95	95	90	97	187	3

USIC 199?

----------HI-WING MONOPLANE----------

(9)

CONTESTANT	AMA#	MODEL	1st FLIGHT	2nd FLIGHT	3rd FLIGHT	BEST FLIGHT	FLIGHT POINTS	SCALE POINTS	TOTAL POINTS	PLACE
64 M Thompson	1484	Lacey M-10	2:42	-	-	2:42	82.5	56	138.5	1
16 Jim Miller	89382	HI-MAX	2:27	-	-	2:27	82.5	53	135.5	2
27 Sidney Gilbert	1803	Lacey M-10	1:30	-	-	1:30	75	54	129	3

1995 USIC (11) ----------KIT PLAN SCALE - 213 ----------

CONTESTANT	AMA#	SUBJECT	1	2	3	4	5	BEST FLIGHT	BEST (MAX)	2nd FLIGHT	2nd (MAX)	FIDEL.CRAFT PNTS	BEST 2FLTS	TOT PNTS	PLACE
15 Jim Grant	159477	0-57 Taylorcraft	110	111	-	-	-	111	98	110	98		98	294	1
66 Richard Miller	179518	???????	120	111	-	-	-	120	95	111	95		95	285	2
09 Dr.John Martin	712	Dornier Komet	102	111	-	-	-	111.0	92	102	92		92	276	3

1995 USIC (7) ----------FEDERATION ROG----------

CONTESTANT	AMA No	1	2	3	4	5	BEST FLIGHT	PLACE
77 A Tagliafico	5533	07:39	02:59	09:15	-	-	09:15	1
60 Daniel Baird	29698	07:10	02:26	06:22	05:44	06:18	07:10	2
18 Tom Sova	473169	06:09	05:59	02:48	06:52	-	06:52	3

SAM 86 SPEAKS

The following article about a pitch gauge was sent by Dan O'Grady and published earlier in the newsletter he edits "SAM 86 Speaks". SAM stands for the "Society of Antique Modellers". The newsletter mainly covers outdoor modelling but regularly contains indoor information as well. Ten issues of SAM 86 Speaks are published annually. For subscriptions send $12 (U.S.), $15 (Canada and overseas) to Dan O'Grady, 50 Largo Crescent, Nepean, Ontario, Canada K2G 3C7. Do not address cheques to SAM 86 Speaks.

MY FAVOURITE PITCH GAUGE

by Roy Bourke (CAN)

I sometimes think there must be as many designs of pitch gauges for indoor model propellers as there are indoor modellers. I have seen many, and tried several, but so far my favourite is an adaptation of a basic design by Bill Henderson of the Markham Group. Bill's design was for an easy-to-handle direct reading gauge which will sit on a flat work surface and form a stable platform for measuring or setting up the blades of a propeller. My modifications include changing the construction slightly, adding a protractor, and a height adjustment for the prop shaft mount. The resultant gauge is very versatile and convenient to use on the home work bench. It is (or can be) built entirely of wood, so anyone should be able to handle it's construction.

Direct-reading gauges use either a fixed radius, or a fixed pitch angle (usually 45 degrees), and the scale is calibrated using that fixed parameter so that it reads the pitch directly. They are fast to use but limit you to measuring pitch at only one radius on the prop blade. A gauge with a protractor allows you to measure pitch angle at several stations along a prop blade and determine the pitch profile of the prop, using tables to define each pitch, a slow, but more complete process.

The gauge presented here will operate in both modes, measuring pitch angle at any radius and determining pitch from a pitch table, or setting the protractor at 45° and reading pitch directly from another scale. The gauge features an adjustable-height prop-mount stanchion, which allows a wide variety of prop designs to be properly aligned along the axis of the gauge. Also, the gauge is symmetrical, so left-hand props can be measured simply by reversing the protractor slide in it's tracks.

Construction of the gauge is mostly from 1/8" aircraft birch plywood, and some birch, bass, or spruce for the track. I used aluminium for the prop-mount stanchion, but birch or other hardwood should do an adequate job. Generally, dimensions and construction are not critical so feel free to modify and innovate. Be sure that the stanchion and its support are aligned carefully so that the groove for holding the prop shaft is exactly perpendicular to the base in both directions. A clear plastic 4" protractor should be readily available from any stationary supplier, but you may have to modify the protractor slide to suit your particular protractor.

The scales can be marked directly on the plywood base, or (preferably) you can use a piece of thin cardboard glued to the base. Calibration of the "radius" scale is straightforward once you have determined the zero point (directly under or in line with the groove in the stanchion). For the direct-reading "pitch"-scale, you can calculate the position of each mark as follows:

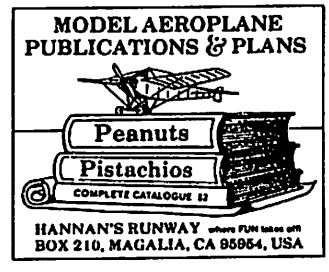
(Pitch) $P = 2\pi R \tan \alpha$

where R is the radius from the prop hub, and α is the pitch angle

Since we are using a fixed pitch angle of 45°,
$\tan \alpha = 1$. Hence the formula becomes: $P = 2\pi R$
or, $R = (0.159155)P$

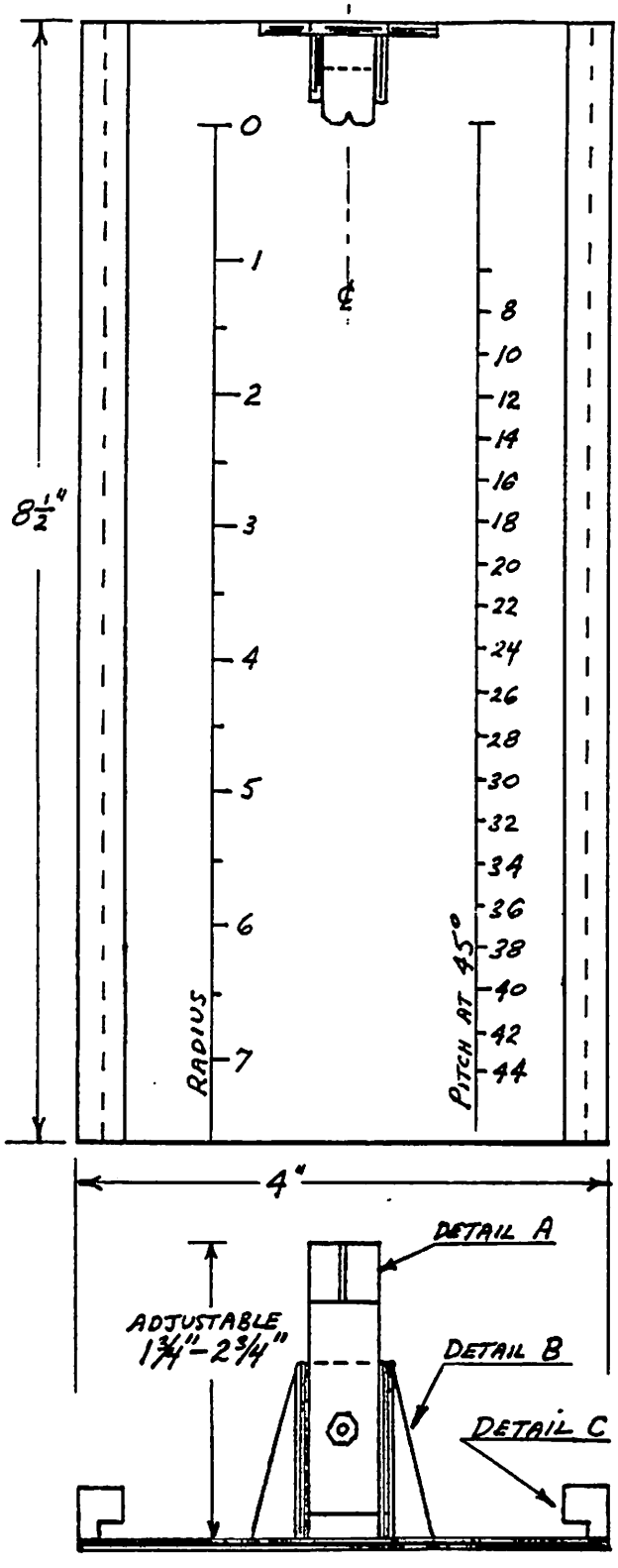
So to mark the pitch scale every 2" of pitch, starting with 8" pitch, the 8" pitch mark would be 0.159155 x 8, or 1.27" from the prop hub, the 10" pitch mark would be 0.159155 x 10 or 1.59" from the prop hub, the 12" pitch mark would be 0.159155 x 12 or 1.91" etc..

If you wish, you could add a third scale, calibrated for direct reading at a fixed-pitch angle, say 30°. Such a direct-reading scale might be useful for plastic propellers, which tend to have lower pitches. Other useful innovations might include a clamp to lock the protractor slide at any radius, and a hinged (flip-down) protractor mount to allow you to swing the prop 180° without moving the protractor slide out of the way.



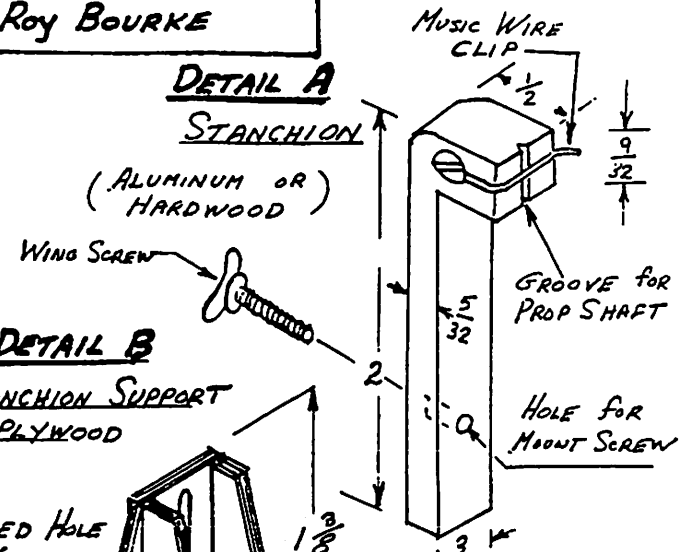
PITCH GAUGE
by Roy Bourke

BASE AND STANCHION TOP VIEW

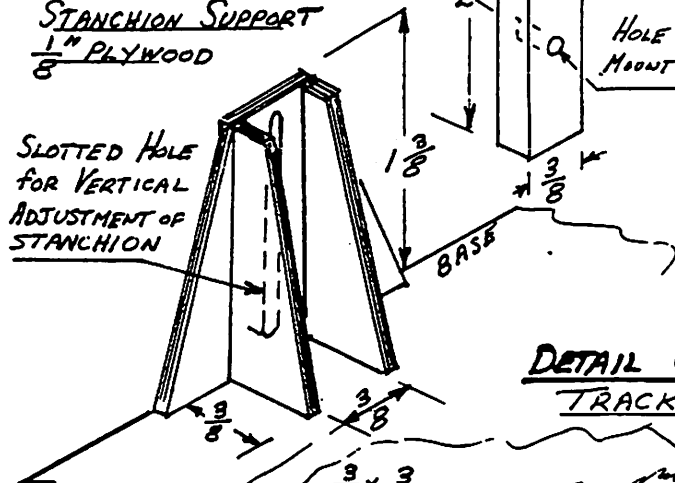


BASE AND PROP MOUNT STANCHION
(NOT TO SCALE)

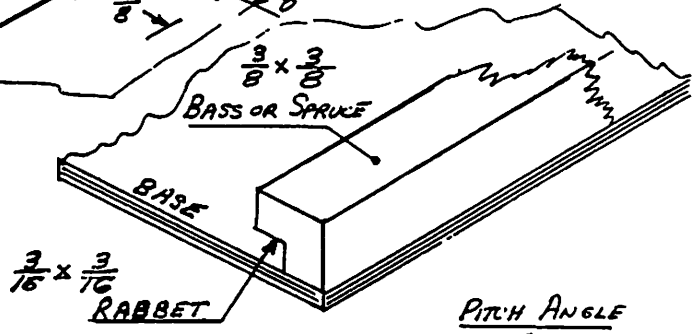
DETAIL A
STANCHION
(ALUMINUM OR HARDWOOD)

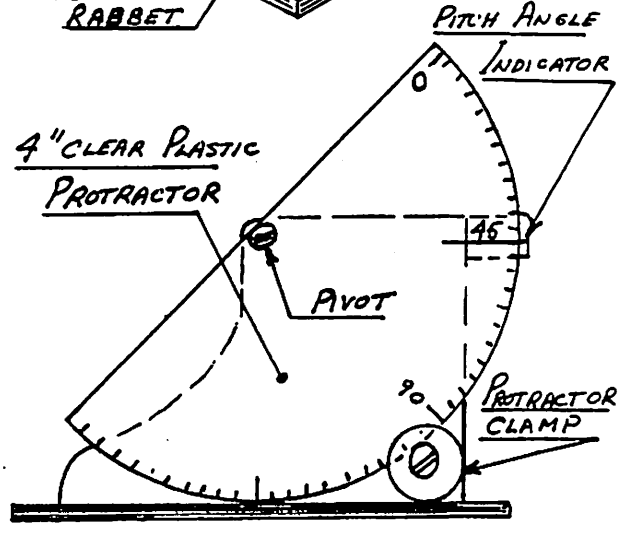


DETAIL B
STANCHION SUPPORT
⅛" PLYWOOD



DETAIL C
TRACK



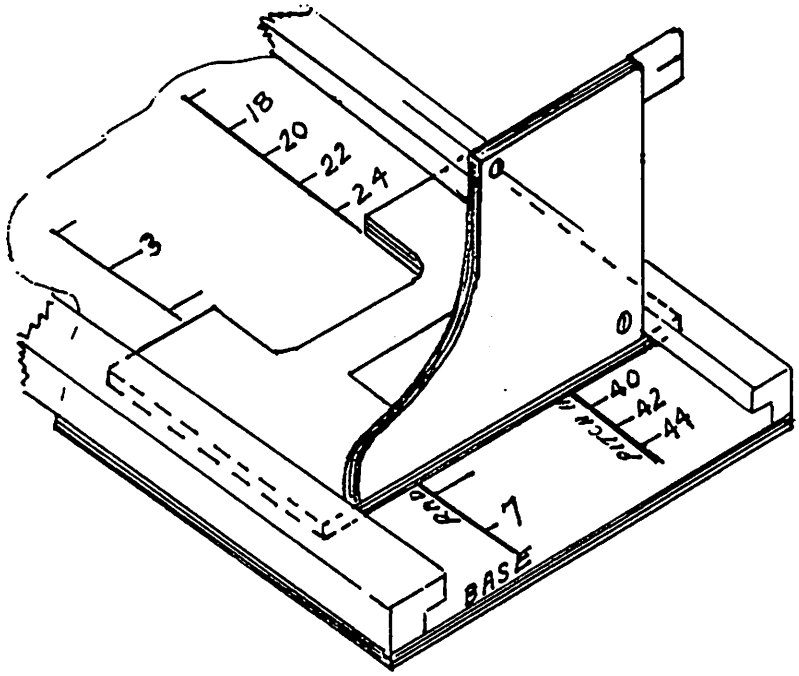


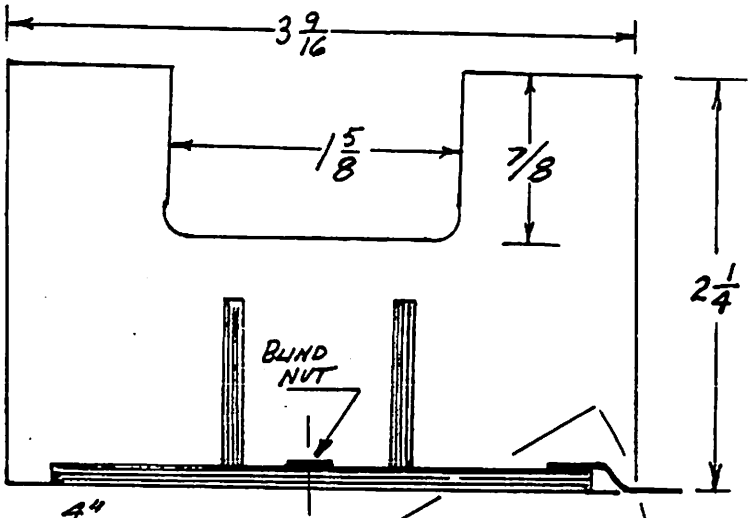
PROTRACTOR SLIDE (SEE DETAIL D)
(NOT TO SCALE)

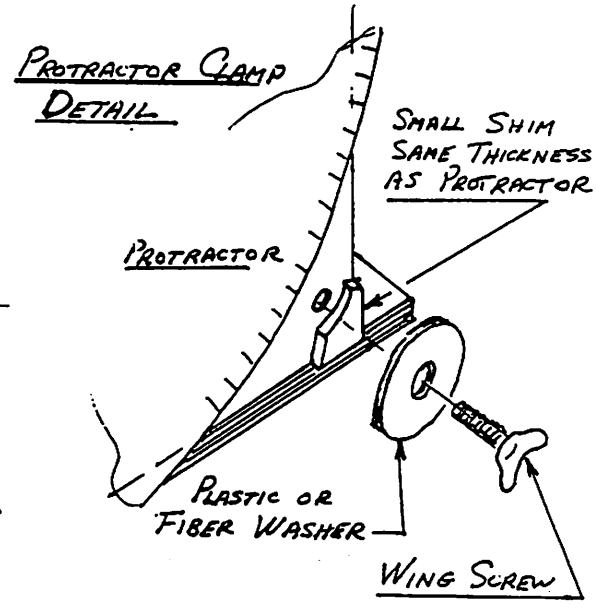
DETAIL D

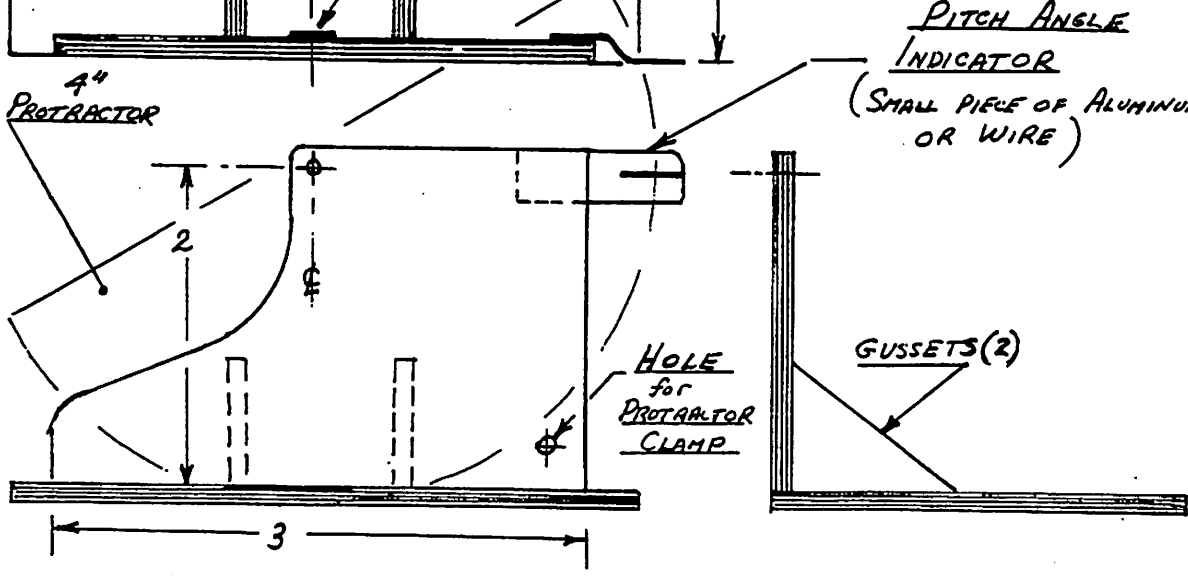
PROTRACTOR SLIDE

(PROTRACTOR OMITTED FOR CLARITY)









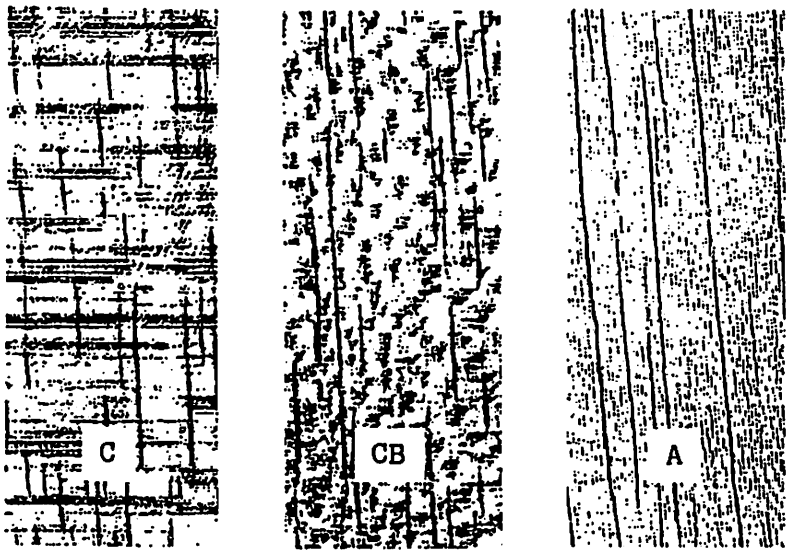
J. H. MAXWELL

Aids For Advanced Aeromodelling

14 UPPER CRAIGS, STIRLING FK8 2DG, SCOTLAND

Telephone 01786 472524
FAX 01786 447325

INDOOR LIST



INDOOR BALSA

This is expert-standard balsa, with no concessions to time or trouble in its preparation. It incorporates Stiffness Grading, which is not found in any other brand.

Each sheet is stamped with a unique serial number, and presented in a protective sleeve. The sleeve carries the same serial number plus data for Grain, Thickness, Density and Stiffness.

Grain - Choice of three grains, as shown in the photographs above.
C - Rays appear as stripes. Very stiff across the sheet.
CB - Rays appear as speckles. Use where C is too stiff.
A - Tangent cut. Best for stripping.

Thickness - Sheets are 18" x 1.125" any thickness from 0.008" up to 0.125", cut to order.

Density - 4 to 7 lb/cu.ft Each sheet is weighed and calculated individually.

Stiffness - Given as a percentage of the average. This was explained in Free Flight News, January 1994. A copy of the original article accompanies this List.

"BALSA for INDOOR MODELS" by Joe Maxwell

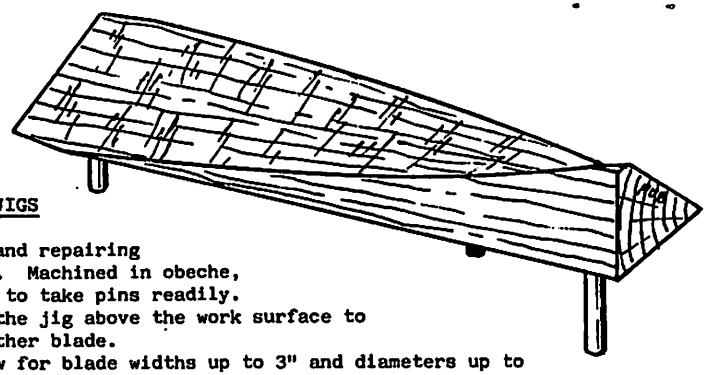
Look out for this little book, which will be in print soon. It is packed with hitherto unpublished facts and information on Indoor balsa. It also scotches several long-established myths on the subject.

METRIC UNITS

The units used in this List are inches and lb/cu.ft. These are easily converted to metric as follows -

To obtain mm from inches, multiply by 25.4

To obtain gm/cc from lb/cu.ft, divide by 62.5

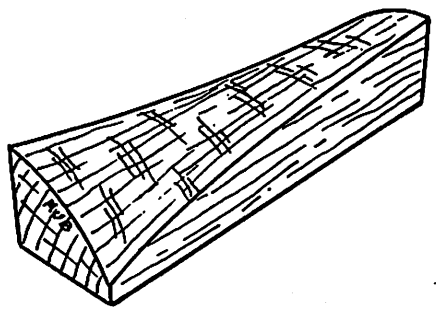


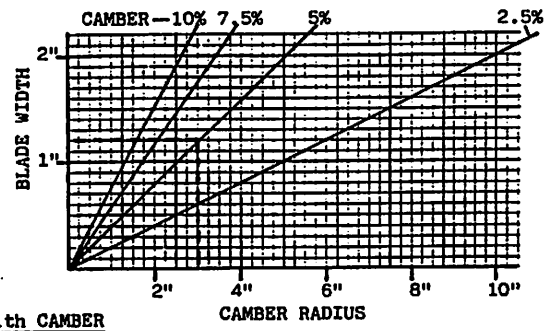
MICROFILM PROPELLER JIGS

Jigs for building and repairing microfilm propellers. Machined in obeche, which is soft enough to take pins readily. Removable legs lift the jig above the work surface to give space for the other blade.

Standard jigs allow for blade widths up to 3" and diameters up to 25". Any pitch.

The axis of twist (location for a straight spar) may be on the centre line or some distance behind it, to give more clearance from the wing.





FORM BLOCKS for PROPELLER BLADES with CAMBER

These blocks, for forming balsa propeller blades, are machined in obeche to the required pitch and camber. Standard blocks will take any blade width up to 2" and any length up to 9". Other sizes on request. Any pitch. Any camber.

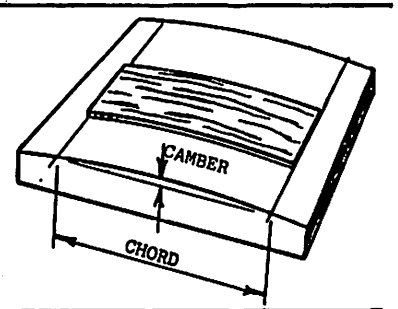
Camber radius depends upon blade width and camber percent. Use the graph to find the camber radius to suit your propeller. Example - Blade width 1.2", camber 5%, therefore camber radius 3"

RIB FORM BLOCKS

Formed ribs are superior to sliced because the grain follows the camber, with no areas of short grain. Just form a piece of A grain sheet on one of these blocks and then cut off the ribs, to the required thickness, with a balsa stripper.

The blocks are machined in Medium Density Fibreboard (MDF) and are wide enough to take diagonal ribs as well as straight.

Any chord. Any camber.

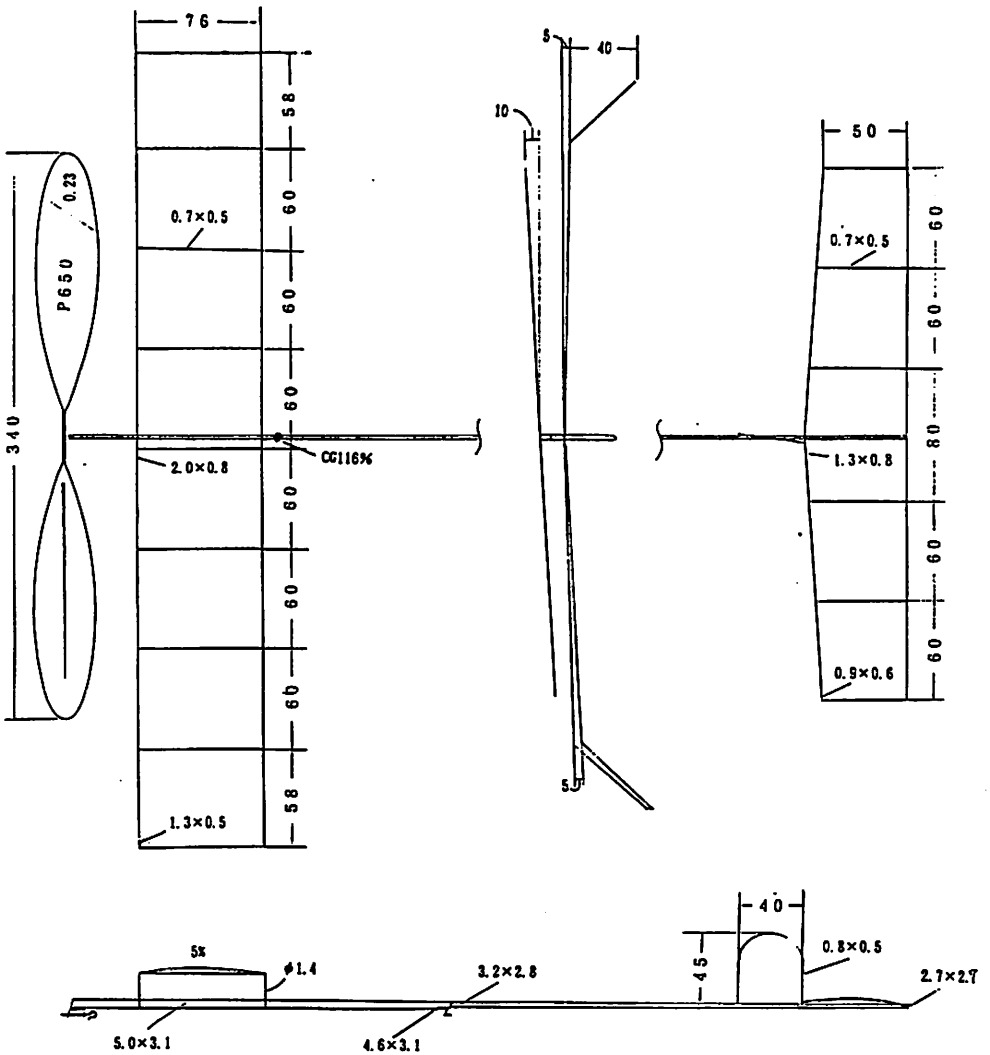


OUTDOOR AIDS

Leading outdoor Free Flight enthusiasts have used these products for many years. They are, of course, still available, and include -

Cambered building boards on which to construct accurate wings.
Sets of machine-cut ribs.
D-box moulds and presses.
Propeller blade moulds.
Propeller blade blanks, in balsa.

A list giving details of these and other outdoor supplies will be sent on request.



WEIGHT

PROP	プロペラ	0.23g
WING	主翼	0.22g
STICK/TAIL	ﾃｰﾙｽﾃｨｯｸ+ﾃｰﾙ	0.40g
TOTAL	合計	0.85g

News Indoor

TAKAJI MASAKI
製作開始時次
記録 17分11秒
(1994年9月17日)

J. H. MAXWELL

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INDOOR PRICE LIST and ORDER FORM

April 1995

NAME

BLOCK CAPITALS, PLEASE

ADDRESS

QUANTITY	DESCRIPTION & PRICE			COST
	Indoor Balsa Sheets each £3.40			
	Grain	Thickness	Density	
	Grain	Thickness	Density	
	Grain	Thickness	Density	
	Grain	Thickness	Density	
	Grain	Thickness	Density	
	Grain	Thickness	Density	
	Grain	Thickness	Density	
	Grain	Thickness	Density	
	Grain	Thickness	Density	
	Grain	Thickness	Density	
	Microfilm Propeller Jigs each £12.00			
	Pitch			
	Pitch			
	Propeller Form Blocks with Camber each £10.00			
	Pitch	Camber radius		
	Pitch	Camber radius		
	Rib Form Blocks each, up to 3" chord £3.00 add 50p for each inch over 3"			
	Chord	Camber		
	Chord	Camber		
	Post and Packing Charge - U.K. none Europe £2.00 U.S.A. and rest of World £4.00			
			TOTAL	£ :

PRICES IN $US - Multiply the £ price by the current rate of exchange (obtainable from business news or your bank) then add 6% for conversion.

METHODS OF PAYMENT WITH ORDER - Sorry, no credit cards or COD, but most other forms of payment acceptable. Choose whichever suits you best.

U.K.- Cheque, P.O., cash.

Europe - Eurocheque, Giro, £ notes, $US bills.

U.S.A. and rest of World - £ cheque or money order, $US bills. $US cheques are o.k. but cost £5 each to convert, which must be added to the total

M

Main spar	Longeron principal	Hauptholm
Mean camber	Cambrure médiane	Mittellinienwölbung
Moment arm	Bras de levier (B.L.)	Hebelarm
Motor mount	Bâti moteur	Motorauflage
Motor run	Déroulement	Motorlaufzeit
Motor stick	Fuselage avant, poutre écheveau	Motorträger

N

Needle	Aiguille	Nadel
Nose	Nez	Nase
Notch	Entaille	Einschnitt

O

O-ring	Anneau	O-ring
Outer panel	Panneau externe	Flügel Ohr
Outline	Dessin/Contour	Umriss

P

Panel	Panneau	Paneel
Paper tube	Tube papier	Papierröhrchen
P/D (Rel.pitch)	Pas relatif	Relative Steigung
Piano wire	C.A.P. (corde de piano)	Stahldraht
Pigtail bearing	Queue de cochon	Schweineschwanzlager
Pin	Épingle	Nadel
Pine	Pin	Kiefer
Pitch	Pas d'hélice	Steigung (Luftschr.)
Plane	Avion	Flugzeug
Plain	Aplanir	Hobeln
Planking	Coffrage	Eindeckung
Plywood	CTP (contre-plaqué)	Sperrholz
Port	Gauche	Backbord, links
Power	Puissance	Motorleistung
Power burst	Surpuissance	Kraftüberschuss
Pre-stressed	Pré-tendu (moteur)	Vorgedehnter Gummistrang
Propeller	Hélice	Luftschraube
Propeller, single blade	Monopale	Einblatt Luftschraube
Propeller, 2-blade	Bipale	Zweiblatts Luftschraube
Prop. blade	Pale	Luftschr. Blatt
-"- hanger, support	Palier avant	-"- Blechlager
-"- hub	Moyeu d'hélice	-"- Nabe
-"- outline	Contour de pale	-"- Umriss
-"- rib	Nervure de pale	-"- Rippe
-"- shaft	Axe d'hélice	-"- Welle
-"- spar	Longeron d'hélice	-"- Holm

R

Rasor blade	Lame de rasoir	Rasierklinge
Rib	Nervure	Rippe
Rear hook	Crochet	Haken
Rear spar	Longeron arrière	Hintere Holm
Right	Droit	Rechts
ROG (Rise of ground)	Décollage	Bodenstart
RPM	Vitesse de rotation	Drehzahl
Rubber band	Bracelet caoutchouc	Gummiband
Rubber motor	Moteur caoutchouc	Gummimotor
Rubber stripper	Machine à refendre	Gummischneider
Rudder	Dérive	Seitenleitwerk

S

Sand	Poncer	Schleifen
Scale	Echelle/Maquette	Masstab/Skale
Sheet	Planche, Planchette	Brettchen
Sheeting	Coffrage	Beplankung
Side thrust	Vireur au moteur	Seitenzug
Skein	Écheveau	Gummistrang
Soldered	Soudé	Gelötet
Soldering iron	Fer à souder	Lötkolbe
Spacer	Entretoise	Steg
Span	Envergure	Spannweite
Spar	Longeron	Holm
Speed	Vitesse	Geschwindigkeit
-"-, sinking	Vitesse de chute	Sinkgeschwindigkeit
-"-, stalling	Vitesse de décrochage	Abreissgeschwindigkeit
Spring	Ressort	Feder
Square, perpendicular	d'Equerre	Rechtwinklig
Stabilizer	Stabilo	Höhenleitwerk
Starboard	Tribord	Steuerbord, rechts
Stall	Décrochage, perte de vitesse	Überziehen
Steel	Acier	Stahl
Strand	Brin	Strang
Strut	Hauban	Stütze
Surface, area	Surface	Fläche, Inhalt
Sweepback	Flèche (aile)	Pfeilung

T

Tail	Empennages, queue	Höhenleitwerk
Tailboom, tail cone	Poutre arrière	Leitwerksträger
Tailplane	Stabilo	Höhenleitwerk
Tape	Ruban (adhésif)	Klebeband
Tapered	Bisauté, effilé	Konisch
Template	Gabarit	Schablone
Thick, thickness	Epais, Epaisseur	Dick, Dicke