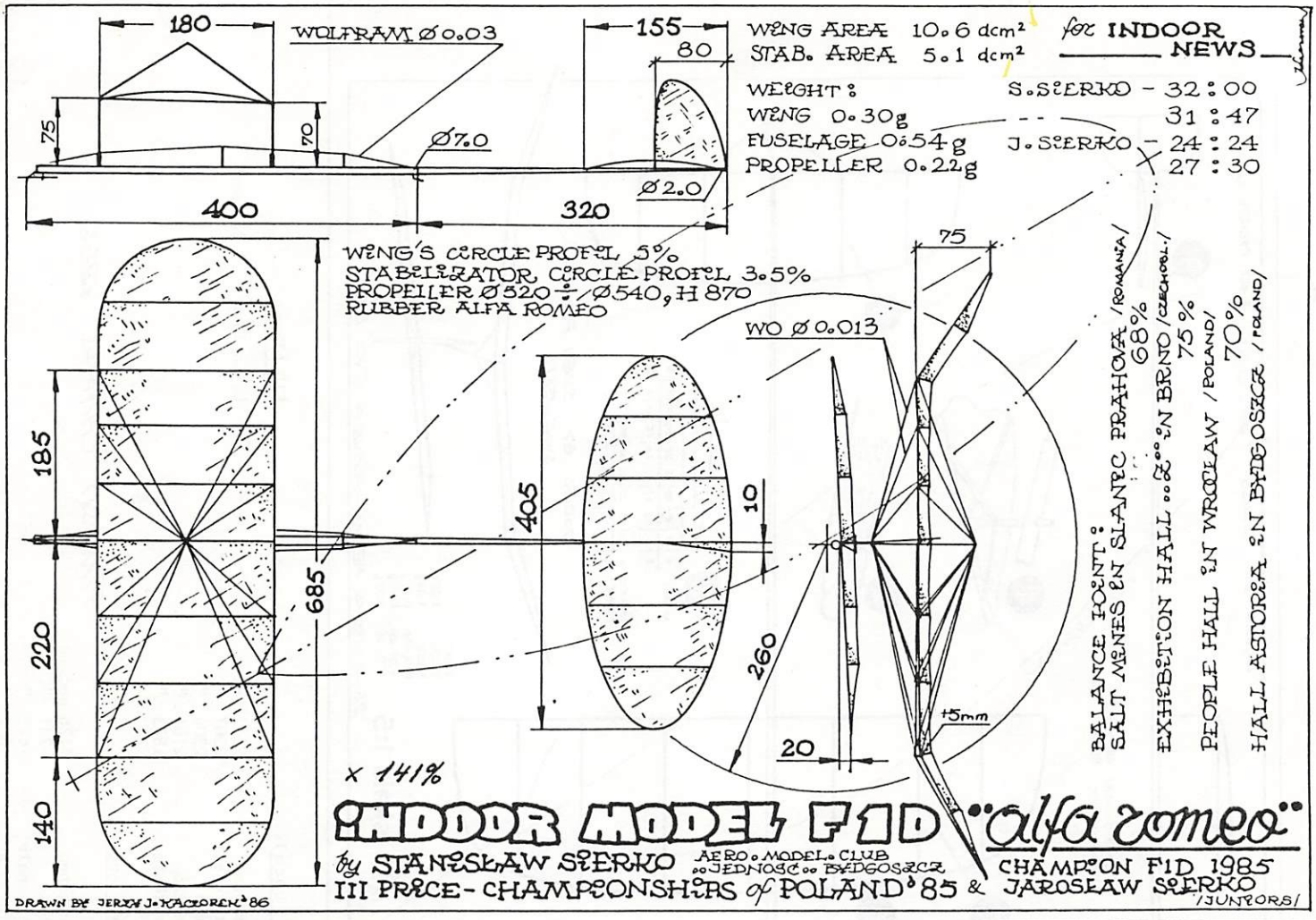
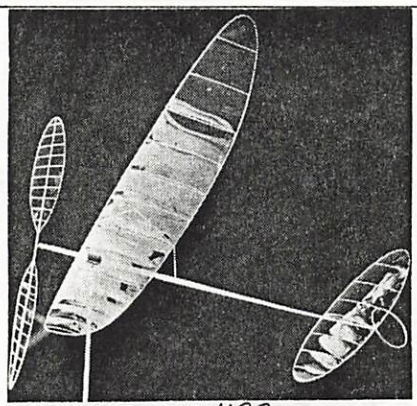


INDOOR NEWS ·2·1986



NOSTALGIA !!??

Dear friends,

Just finished this issue at the end of June, being very busy about making preparations for the big event at the Cardington "Cathedral" as the Archbishop (Laurie Barr) calls it. I hope that a great many indoor flyers will meet there and enjoy the friendly and helpful atmosphere which always seems to be the rule, when the indoor people see each other.

This issue has been possible because of the many contributions sent to me, and this makes the editor quite confidential for the future.

A few contributions have been printed directly in the handwriting of the contributors due to the very readable writing and - lack of time. I hope this will pass on!

On page 8 you will find a small note about a booklet which I have planned to produce - the first ever F1D planbook....!

.... Again many of the drawings have been reduced by 71% so by enlarging by 141% (on most modern copy-machines) you will get a convenient scale dwg, in case of the Peanut a full size building drawing ...

Editor etc., etc....

Jørgen Korsgaard
Ahornweg 5
D-2397 Ellund-Handewitt

W. Germany

Phone 04608-6899

3 issues :

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Europe 50,- Dkr
Airmail outside Europe 60,- Dkr

SOME SWEDISH RESULTS...

RESULTAT FRÅN INOMHUSTÄVLINGEN I KATRINEHOLM 1985 10 19

PENNY SM-25öres , Peanut , Hkg och Flugan

25-öres Juniorer	Org.	1	2	3	4	5	6	Sum.	
1. Peter Comet	MfkVingarna	1.15	6.47	3.37	8.02	1.50	8.45	16.47	min.
2. Kristian Edlund	Nimbus	--	--	5.12	5.25	3.23	--	10.37	.
3. Tomas Larsson	"	--	3.53	4.12	3.36	3.38	4.02	8.14	
4. Lars Gerdin	"	.14	4.05	.10	2.45	3.44	.20	7.45	'
5. Andreas Giaever	"	2.43	--	3.25	3.39	3.42	3.46	7.28	'
6. Per Eriksson	"	2.52	2.40	--	3.17	3.09	2.27	6.26	'
7. Andreas Edhammer	"	--	2.43	3.05	--	3.09	2.50	6.14	'
8. Tord Gustavsson	Oxelösund	1.32	2.04	1.20	2.25	.26	1.37	4.29	

25-öres Seniorer PENNY									
1. Sven Pontan	Handens Mfk	7.48	--	7.54	--	5.56	4.50	15.42	min
2. Lars Linden	Nimbus	5.09	1.20	1.08	6.38	3.19	6.04	12.42	
3. Sven-Olov Linden	"	4.10	2.51	2.20	5.39	5.03	5.31	11.10	
4. Olle Blomberg	"	--	1.07	5.20	4.38	4.45	5.11	10.31	
5. Bengt Blomberg	Gamen	5.07	3.50	5.19	4.17	4.11	3.42	10.26	
6. Göran Åberg	"	.25	4.49	5.04	4.34	5.02	5.15	10.19	
7. Owe Carlsson	Malmö	2.18	3.52	3.04	4.06	.07	4.12	8.18	

Peanut (Inomhusklass)		Modell	Skalapoäng	Flygtid	Sum.poäng
1. Lennart Liljenberg	Handen	Isacé Fury	100	39 + 36 =75	175
- " -		Piper Cub J3	74	37 + 39 =76	150
- " -		Pilatus Porter	60	38 + 38 =76	136
2. Olle Blomberg	Nimbus	Lacey M10	32	51 + 55 =106	138
- " -		Bü 131 Jungman	96	18 -- =18	118
3. Tomas Wisur	Oxelösund	LaceyM10	74	27 + 26 =53	127

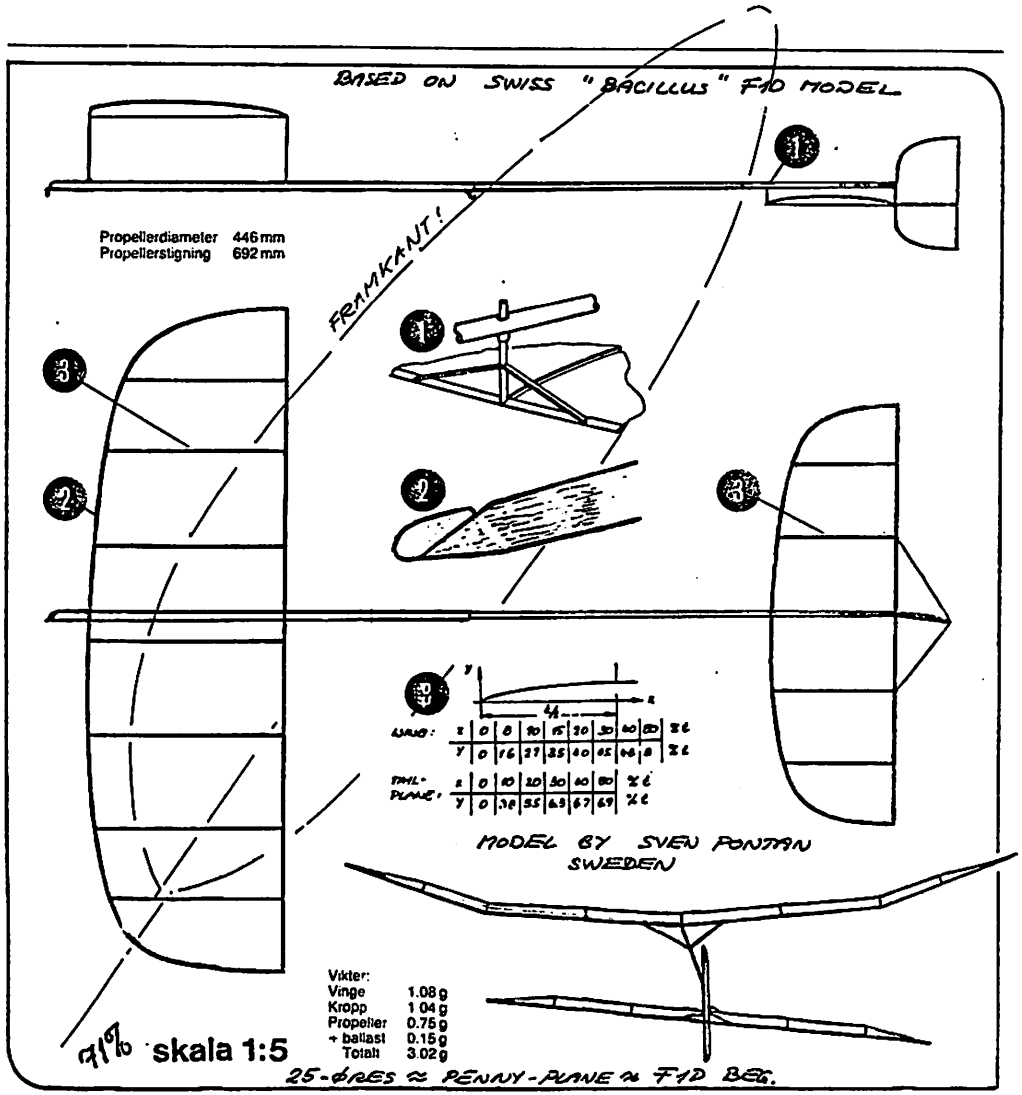
HKG (Handkastglidare) IMLG

1. Peter Comet	MFK Vingarna Helsingborg	22	24	28	26	27	27	= 55 sek.
2. Sven Pontan	Handen	25	9	4	12	25	24	= 50
3. Jonas Romblad	"	21	10	23	19	17	9	= 44
4. Lars Linden	Nimbus	19	17	14	4	7	17	= 36
5. S-O Linden	"	14	11	16	16	14	14	= 32

FLUGAN OPEN (fri gummimotor) * AMA-CUB

Lars Tolkstam	Nimbus	61	15	58	--	--	--	= 119
Peter Comet	Helsingborg	9	39	31	39	34	41	= 80
Stefan Edhammer	Nimbus	9	17	25	36	30	32	= 68
Per Ericsson	"	29	32	20	28	26	19	= 60
Tomas Wisur	Oxelösund	24	33	24	11	9	10	= 57
Jan Johansson	"	26	21	11	25	16	18	= 51
Bengt Blomberg	Gamen	8	38					= 46

2-2/83



FID (65cm)

L. Englund	2642 sec
H. Erofejeff	2507 "
P. Nore	2304 "
H. Raulio	2161 "
K. Heikkala	1873 "

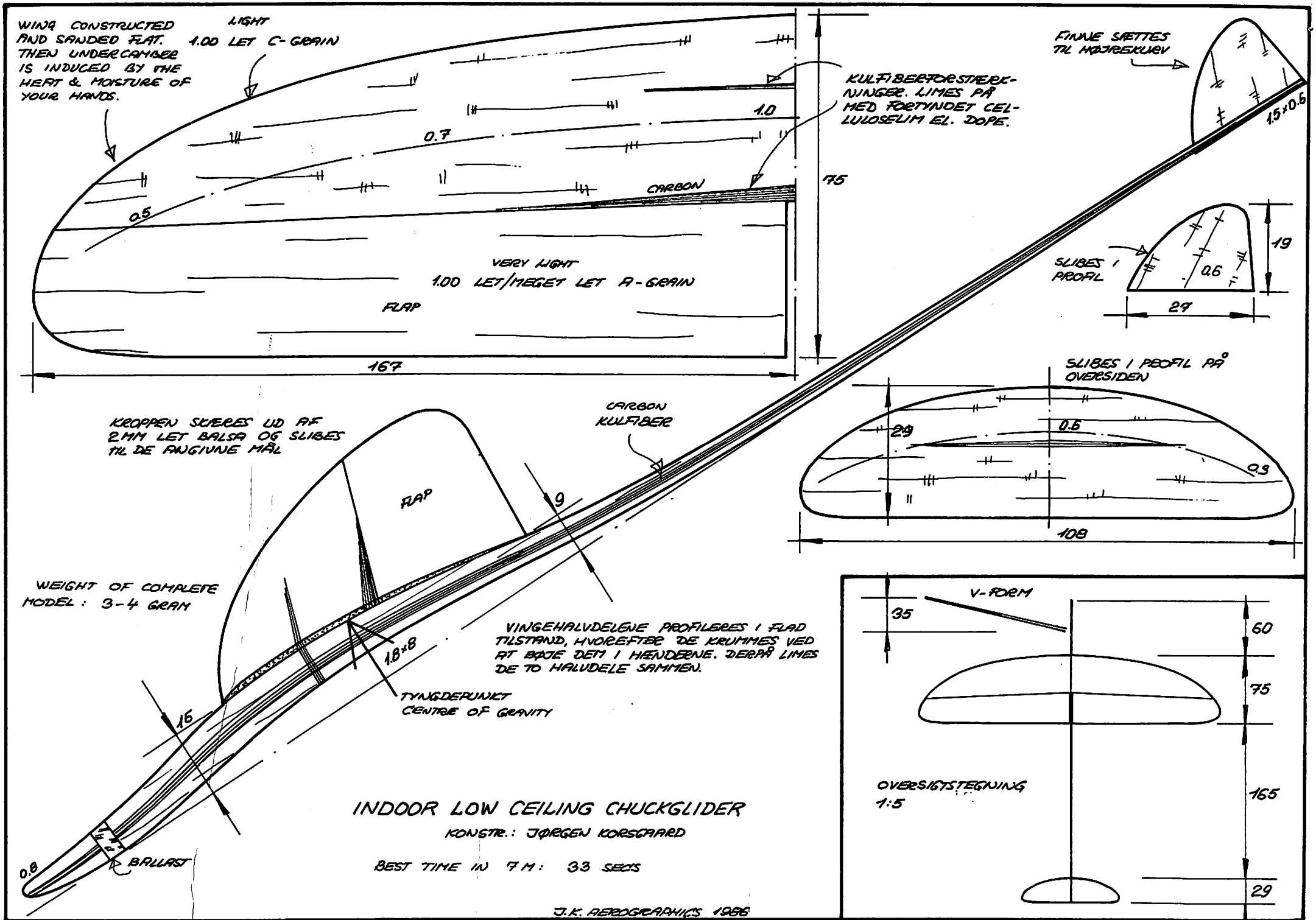
FID (35cm)

L. Englund	331 sec

Penny-Plane

T.Tynkkynen	1126 sec
P. Lehto	731 "
T. Linkosalo	622 "
T. Sihvonen	601 "
K. Halsas	35 "

FINNISH CHAMPS 1986



INDOOR LOW CEILING CHUCKGLIDER

KONSTR.: JØRGEN KORSGAARD

BEST TIME IN 7 M: 33 SECS

J.K. AEROGRAPHICS 1986

FAMOUS SITES..... AKRON.

- Length: 1,175 ft
- Width: 325 ft
- Height: 211 ft
- Inside clear height: 180 ft
- Floor space
  - Open area, ground floor*: 226,000 sq ft
  - Enclosed area, ground floor*: 138,000 sq ft
  - Enclosed area, mezzanine: 84,000 sq ft
  - Total floor space: 364,000 sq ft (8.4 acres)
- Added floor space, adjacent building*: 13,000 sq ft
- Volume: 55,000,000 cu ft
- Skylights: 23,000 sq ft

The Goodyear Airdock – located on the southeast edge of Akron, Ohio – is adjacent to the Akron Municipal Airport and is easily accessible to railroads and main highways.

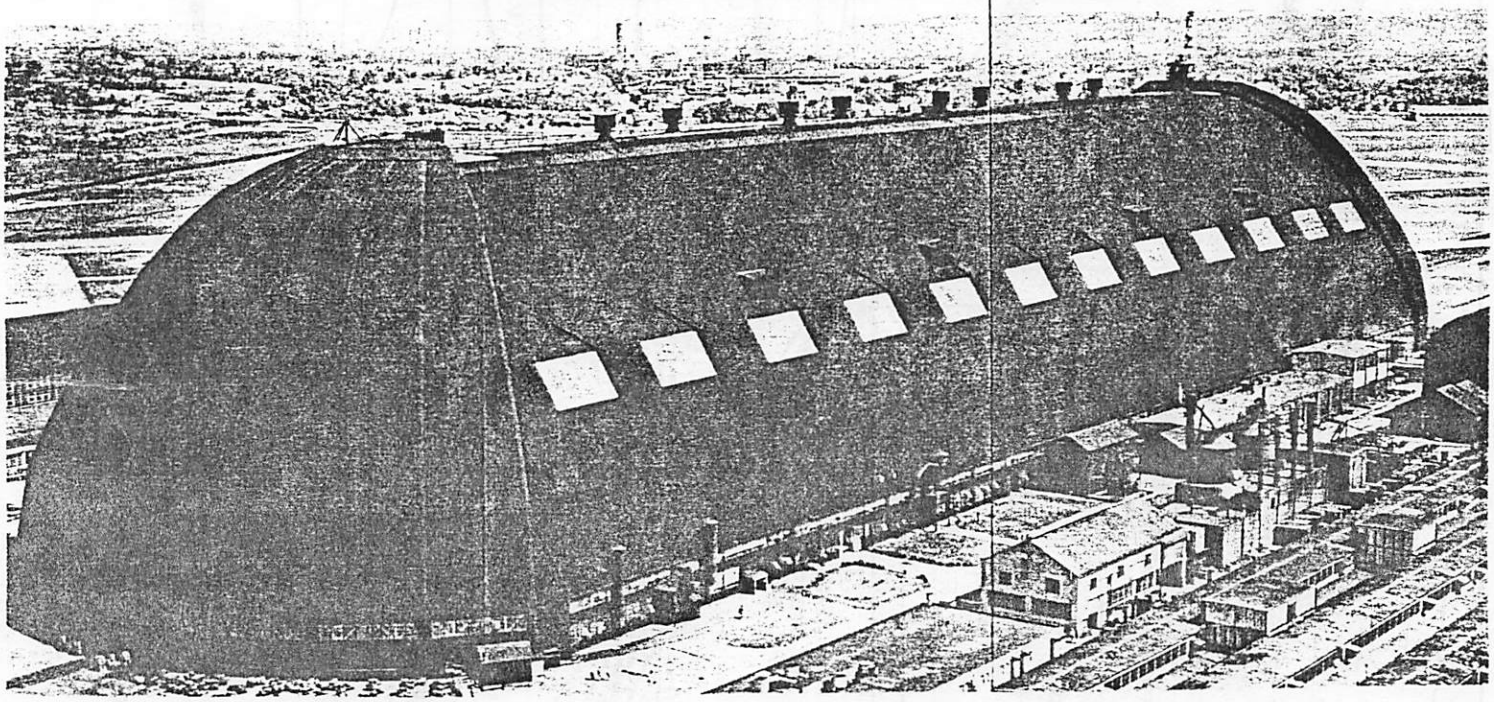
It's big – very big – 1175 feet long, 325 feet wide, 211 feet high, with a ground floor space of 364,000 square feet or 8.4 acres – all concrete covered.

That means it's big enough to accommodate seven football games simultaneously, to seat 100,000 persons, to house two aircraft carriers, or to cover two Washington Monuments laid end to end.

And it's tough – steel arch construction covered with metal siding – and so sturdy that the 8.4-acre floor space does not have to be obstructed by any vertical supports.

These and other features add up to a unique, giant structure with vast potential:

- Each end can be opened to expose the full height and width of the hangar. This is made possible by 600-ton, orange-peel-shaped doors – two on each end – that are mounted on railroad tracks and operated by rack and pinion drives.
- A railway spur – connected to the main railroads – runs the entire length of the Airdock, along the center.
- The under side of the curved roof is accessible to workmen, thanks to a combination of six catwalks, platforms lowered from the ceiling, and an inclined railway that lifts and lowers counter-balanced cars along the contour of the Airdock.
- All service facilities – power, light, water, natural gas, and compressed air – are brought into the Airdock via underground tunnels that run along the entire length and width of the Airdock.
- Light and heat are provided for 222,000 square feet of enclosed areas, located on the ground floor and on mezzanines.
- Complete fire protection is ensured by a 10-inch water line that encircles the Airdock and is connected to hydrants and hose stations.



V.P. PROPS....

Jim Fullarton, Australia, writes ....

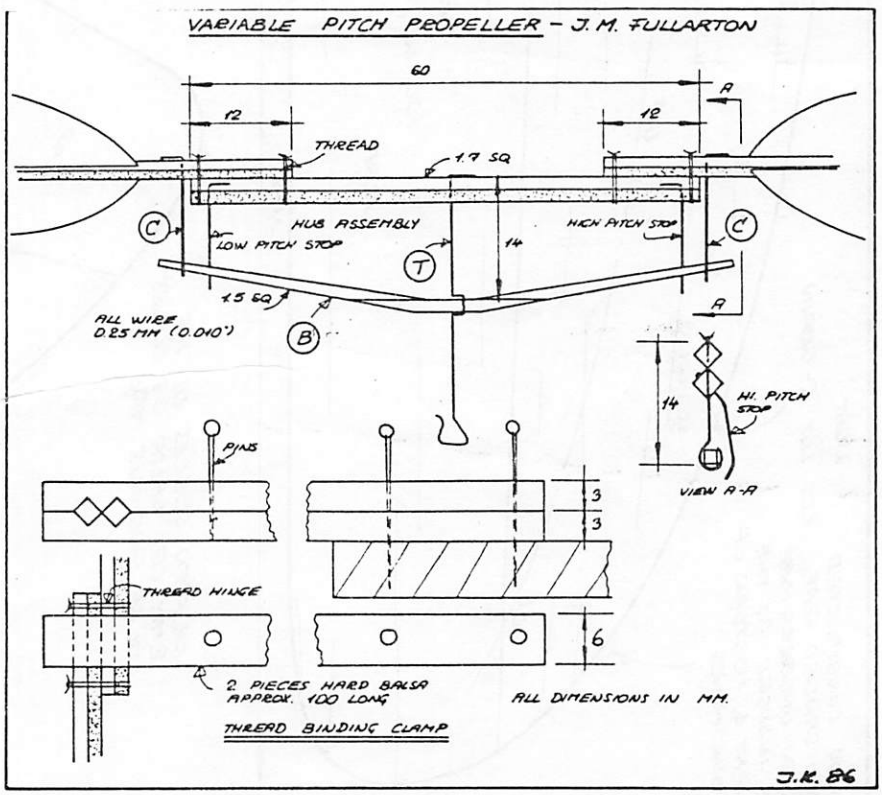
Dear Sir,

Enclosed is a sketch of a simplified type of variable pitch mechanism which I have been using recently with satisfactory results on an EZB. It employs the standard torque operated torsion bar principle that has been in use for some years, but has a different method of pivoting the blade roots to the hub, where the usual paper tubes have been replaced by thread hinges.

I have never liked the paper tube idea, due to the large frictional forces generated by the thrust moment on the blades, and I have always been rather astonished that they work as well as they do. However, I have observed that pitch change tends to occur in jerks, as the torque differential builds up to a point where it will overcome the friction.

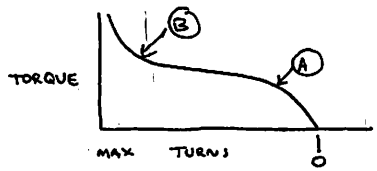
All wire parts are secured with C.A. glue, and it will be noted that the prop shaft does not pass through the operating bar "B" but is bent around it in a U-shape to get a better grip. Also, the cranks "C" and stop arms should be fixed to the balsa BEFORE tieing the thread hinges. After unsuccesfully attempting to secure the threads with the spars just held in my fingers, I remembered the indoor modeller's motto: "When in trouble, build a jig", and made the clamp shown by cutting V-shaped notches in two flat pieces of balsa. This is pinned over the edge of your building board, holding the parts securely and leaving you with both hands free to apply the hinges. Each of which consists of two turns of fine sewing thread, wound in a figure "8" fashion. The threads are lightly coated with thin cement - not C.A. glue.

As the example shown is only a first attempt, I did not endeavour to cut everything down to the minimum, and it could undoubtedly be made lighter. Also, I can see no reason why the thread hinge could not be used with advantage on the type of V.P. system which uses a spiral spring instead of a torsion bar, as on Ron Higg's "Free Spirit" F1D which was illustrated in January '85 Aeromodeller.



RICHARD BLACKAM, AUS. ...

On winding motors; I was interested to read Bernie Hunt's letter on the subject. My own method is to stretch as four as possible, until the motor goes very hard. Then wind at a moderate speed until the torque reading stops rising quickly, indicating the approximate end of the cruise or flat part of the torque curve. (Point A on curve)

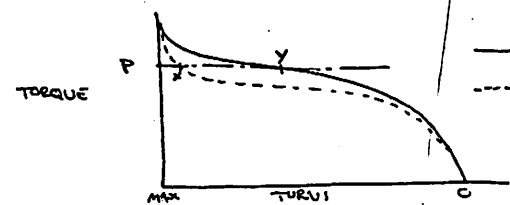


Then, I slowly continue winding whilst gradually moving in towards the torque meter, the intention being to minimise the amount of increase in torque while adding the turns. Eventually you reach a point (B) where the torque starts to rise rapidly, you should be nearly all the way in to the final motor length by now. The last turns (10% or so) take the longest to add. I add one or two turns of the winder at a time while gently massaging the rubber to help the knots settle & remove stress points. You can see this happening on the torque meter: after adding the turns the torque will rise to a certain value & then drop as the rubber is held & massaged. Sometimes the torque drop-off can be as much as 0·1 in.oz. depending on the motor/turns. This final winding process is almost Zen!!

After this the appropriate number of turns are backed off to give the correct launch torque.

We found that most fliers in Australia do not get the most from their motors because they do not wind hard enough. Even in low ceilings you need to wind fully before backing off to the appropriate launch torque.

Every experienced flyer knows this but for the less experienced the reason behind such savage treatment of motors (i.e. hard winding) is due to the hysteresis effect of the rubber. Hysteresis for our purposes, is the effect that the torque for a given number of turns is less while the motor is unwinding than while it is being wound, the net energy loss is the hysteresis.



If a model needs to be launched at torque P to reach the required height it can be seen that to wind directly to torque $P_{(point\ Y)}$ and launch results in less turns available than to wind fully and back off to torque $P_{(point\ X)}$. Although this graph is exaggerated the difference can still be a hundred or more turns, dependant on the ceiling height and rubber used.

With some experience it becomes possible to estimate the max. turns of the rubber without breaking it, simply by getting used to the change in the rate of torque increase while winding, i.e. the faster it goes up the closer to breaking you are.

Formulas for estimation of max. turns are, in my experience, useless because rubber varies greatly in hardness

VOTE: Also max turns are closer when the torque doesn't drop off much after each application of massage & winding.

DANISH CHAMPS - 22-23/2 -86

P-15: 1. Bjarne Jørgensen 174 sek., 2. Ulrik S. Hansen 165 sek., 3. Frank Petersen 156 sek., 4. Jacob Bækgaard 152 sek., 5. Sønke Boldt 143 sek., 6. Jacob Andersen 143 sek., 7. Kennet Albertsen 132 sek., 8. Bjarne Horn 128 sek., 9. Danny Nielsen 99 sek., 10. Thomas Røjgaard 99 sek., 11. Bent Nielsen 98 sek., 12. Jes Nyhegn 89 sek., 13. Anders Jensen 83 sek., 14. Hans Rasmussen 80 sek., 15. Allan Schmidt 79 sek., 16. Villy Larsen 65 sek., 17. Mikael Ernst 58 sek. Chuckglider: 1. Jørgen Korsgaard 69 sek., 2. Jesper F. Jensen 54 sek., 3. Jens Peter Larsen 54 sek., 4. Kåre Rasmussen 47 sek., 5. Hans Rasmussen 41 sek., 6. Hans Jørgen Larsen 38 sek., 7. Klaus Bork 38 sek., 8. Mikael Ernst 36 sek., 9. Jacob Bækgaard 22 sek., 10. Thomas Røjgaard 1 sek. Easy-B: 1. Jørgen Korsgaard 21:24, 2. Jens Peter Larsen 19:24, 3. Hugo Ernst 19:16, 4. Carl-Åge Andersen 16:58, 5. Jesper F. Jensen 15:15, 6. Poul Erik Christensen 14:12, 7. Bjarne Jørgensen 12:57, 8. Hans Rasmussen 12:37, 9. Villy Larsen 9:52, 10. Poul Rasmussen 6:24, 11. Danny Nielsen 4:16, 12. Jacob Bækgaard 3:04. Peanut: 1. Carl-Åge Andersen 50 sek., 2. Kåre Rasmussen 37 sek., 3. Allan Worsøe 7 sek. B1 (35 cm): 1. Jørgen Korsgaard 23:38, 2. Hugo Ernst 23:27, 3. Carl-Åge Andersen 8:11. FID: 1. Jørgen Korsgaard 34:26, 2. Hugo Ernst 18:21.

5-98/2-86

FID BEGINNER..... RICHARD BLACKAM

I have some comments re. the proposals everyone has for an FID beginner class, such as Alfred Klinck's recent proposal. His proposal seems quite reasonable except for the restriction of covering material. Microfilm is the easiest material in the world to cover with! Pouring it is a little harder but for most people not excessively so, obviously Alfred does have some problems due to his climatic conditions. Microfilm also allows the use of poorer quality / harder wood in the model because weight is not such a problem compared with tissue or plastic films.

The main problem with any simple set of rules such as Alfred's is that you end up with long models / large chord wings just like pennyplane. There needs to be some restriction on wing / tail area. And maybe the 3.0 grammes minimum weight is a little high. Not sure about that, but by keeping the flying weight down a little (such as rubber wt. restriction) you can keep some of the magic of indoor models..... grace, slow speed etc. I'm sure this is what got most of us interested in the first place. Also upon reflection I feel that 460 mm span is the minimum useful, 500 or 560 would be better. After all, the EZB is 460mm span and most beginners can easily build these to 2 or 2.5 g so why not go a little larger.

I once made a 550 mm span microfilm model as an exercise (braced, however) with untapered thick spars & ribs, rolled tube & boom; very strong and it came out at about 1.1g. Without the bracing & with correspondingly thicker center spars & solid strut & prop, 3.0 g would be about right.

INDOOR MODEL INTERNATIONAL

DEBRECEN, HUNGARY, MAY 17th, 1959

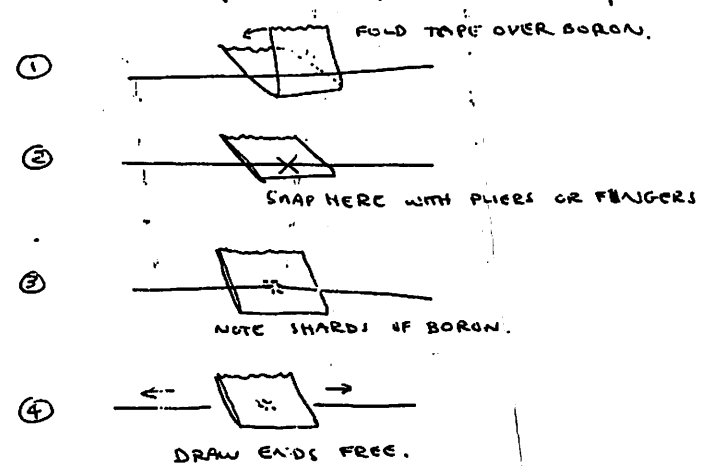
	35 cm. Span	min.	sec.		Over 35 cm. Span	min.	sec.
1	L. Englund—Finland ...	14	27	1	K. H. Rieke—Germany ...	22	05
2	G. Varszegi—Hungary ...	12	36	2	S. Kujava—Poland ...	18	50
3	O. Roser—Hungary ...	11	52	3	L. Englund—Finland ...	17	26
4	S. Niemela—Finland ...	11	49	4	L. Hamalainen—Finland	16	49
5	S. Kujava—Poland ...	10	58	5	Gy. Simon—Hungary ...	16	40
6	L. Hamalainen—Finland	10	57		I. Antal—Hungary ...	15	04

NOSTALGIA

6-2/86

BORON..... RICHARD BLACKAM

The comments on Boron use & safety are interesting. I hate Boron as I have had literally dozens of pieces in my skin. No matter how careful I am. There is one method of cutting this material which is nearly 100% safe, however, and this was devised by my friend Phillip Watson (of ornithopter fame). First, lightly wrap the piece of boron with a small piece of clear adhesive tape at the point at which you want the cut. Snap it whilst it is inside the tape. You will notice tiny shards and fragments of boron that have shattered free due to the extremely brittle nature of this material. Draw the ends of the boron out of the tape & dispose of the tape safely.



Make sure that you don't press the tape together too tightly or you will find it difficult to remove the boron pieces.

I hardly ever use boron in indoor models as I find the weight penalty of glue used to attach it, far too high. Mostly I will use it to beef up an otherwise too weak structure but with my meticulous building records I don't usually end up with a too weak structure.

Bernard Hunt sent me copies of some letters he sent to Steve Brown, USA ... A regular IN reader .....

PROPELLOR DESIGN:

..... I have built some 60 props for EZB's and F1D's over the last years and I just cannot stop the urge to keep on trying something different. This may have been great fun, but for winning competitions it was a disaster. It is perhaps no coincidence that I have done better since I "froze" the prop designs on my frontline F1D and EZB models and confined my experiments to strict test flying. Here goes with my thoughts on propellors which are based more on practical observations than Theory. The elements of prop design are (a) diameter, (b) Pitch/diameter ratio, (c) blade shape, (d) deviation from helical pitch distribution, (e) flaring or distortion under power, (f) gadgets - torque operated variable pitch or diameter and variable ratio "gearbox".

(a) Diameter:

Theory says that prop efficiency increases with diameter and I have some practical evidence of this - 6" dia prop has 50%, 12" dia has 75%, 14" dia has 87% of the efficiency of a 18" dia prop. Results from comparison of Cardington times/glide test sink rates for classes/models with different prop sizes (Peanut, 35 cm, EZB and F1D). Extrapolating these results suggest a benefit from bigger diameter (10% more from 22" dia on F1D), but I have not been able to demonstrate any advantage on either a conventional or tandem F1D. It could be that the known destabilising effect of props start to become significant at these sizes and the model cannot be trimmed as near the optimum CL - (perhaps that is why the US West Coast flyers say they need good calm conditions for big props and maybe the big wing chords help also - alternatively, the increased nutational motion of the whole model might have something to do with it). Other UK flyers have tried big props, particularly Derl Morley, but almost all have come back to 20-21"" except me who uses 18", driven by the special problems of my tandem design.

(b) Pitch/diameter:

This is probably the most critical design parameter for props and the optimum lies in the region 1.8 for F1D's, 2.0 for EZB's, but it does depend on prop shape and deviation from helical pitch and most of all the ceiling height. As pitch/diameter is increased from a practical minimum of 1.5 (for COLD, 230' ceiling - Slanic) the flight profile is flattened (slower climb and letdown) as the prop efficiency becomes lower on the climb and higher on the cruise/letdown. Eventually as the ratio approaches 2.0 both the climb and cruise/letdown fall (but the climb falls faster). It all becomes a question of finding the right balance and "fine tuning for the site and conditions. A flaring prop makes this even more difficult because very small changes in pitch (equals Pitch/dia) cause a dramatic difference in height of climb. Don't think that the effect of pitch/dia is minor, it is not. A few years ago Dave Pymm ran some computer simulations on flight profiles for different pitch/dia ratios for his F1D which showed that a 22" dia, 42" pitch was optimum for 96' ceiling (no touch time: 34.5 min). Reducing the pitch to 39" reduced the time by 2.3 min and increasing the pitch to 45" reduced the time by 5.00 min. My experiences fully bear out these results. Also it is very difficult to build an F1D or EZB prop to a predetermined pitch and keep it there through all the cycles of hot/cold and damp/dry in addition to effects of steering and repairs. I find that it is essential to keep checking the pitch of my props (whatever class) and readjust the pitch as necessary (I use plug-in blades). Finally, it isn't so easy to measure prop pitch reliably to within a half of a degree, so be sure you have a good pitch checker and measure up all your props half a dozen times to be sure.

(c) Blade shape:

I have not found this to be particularly important factor. I have flown with very low aspect ratio, elliptical blades (Derl Morley's "Tattoo"), very high aspect ratio pointed shapes (Jim Richmond's "Catwalker") and more recently with my own moderate aspect ratio, slightly pointed shape. It does seem that the more extremely pointed shapes (Dieter Siebenmann and Dave Pymm) climb more strongly for a given pitch/dia ratio - whether this is an advantage or not depends on the site and conditions.

(d) Non-helical pitch distribution:

By deliberately varying theactual pitch at each station on the blade out from the hub to the tip, o whole range of non-helical distributions can be achieved. The simplest and the one I use is positive rotation of a helical blade (25.5" pitch in the case of my F1D) through an angle of a few degrees (I use 5 degrees). The effect of this is to give a "cruise optimised" pitch distribution for a prop nominally 18" dia, 31" pitch. The theory of this set up is simple and convincing viz. the prop blade needs a few degrees angle of attack when at cruise to give optimum L/D ratio. In practise the prop is slightly more efficient in the cruise/let down phase than the climb phase as compared with a helical pitch distribution, so this kills the climb and improves the letdown - very desireable in all but the highest sites. I suspect that the effect is very similar to using a high pitch/dia prop but perhaps a little less critical. Under very low ceilings I have found very extreme positive rotation to work well (my EZB uses 9 degrees positive). Deliberate wash-in (accidental is easy with sheet EZB blades) probably is similar in effect to positive rotation. I have heard of people using wash-out (less pitch at the tip than at the hub) perhaps thinking that if it helps wings then maybe it will help props, but all it can do is help the climb at the expense of the cruise/letdown which does not sound good. Overall, I suspect these fiddlings with pitch distributions are only second order effects, the most important thing is to have the "nominal" pitch you want and make sure it stays there (both blades!).

(e) Distortion/flaring under power:

I must declare that I don't like flaring props. I can see the advantage of less back off and (slightly) longer times, but I cannot live with the inconsistency particularly at Cardington with its variable temperature and humidity. It is for this reason I have generally used pretty rigid props with the spar set at 40% chord to minimise flare.

(f) Gadgets:

I love thinking of ideas for and building variable-anything propellers and I have books full of designs and boxes full of contraptions as a result. Unfortunately (or fortunately depending how you look at it) my "local" site, Cardington, is not a very good site to gain advantage from them - it is simply too high and the best "air" is to be found in the top third of the shed. Add to this the fact that sometimes it is so cold and damp there that it is difficult to climb at all, it is hardly surprising that VP or VD props have not caught on. Having said that if your local site is 100' or less and ceiling scrubbing won't work, it is definitely worth trying a fancy propeller. Theoretically, variable diameter props should win hands down against variable pitch (at 100' VP should be 15% better and VD 50% better than fixed pitch props). The snag is that both variable props need to be launched with little or no back off and work perfectly to realise their full potential. VP mechanisms are well developed and for a weight penalty of 0.1 - 0.2 g it should be possible to build a very practical mechanism but setting them up is very tricky. VD mechanisms look more of a challenge but Jim Richmond's clearly works and Sylwester Kujawa's mechanism seems to be sound in principle. Ah, well time will tell ....

How about something completely different? A fully variable ratio gearbox invented in the middle ages by clockmakers - it is called a fusee mechanism and comprises two parallel drums, one cylindrical and the other conical (both conical in the model version) joined by a cord (gut for clocks but tungsten wire for models) which starts off wrapped round one drum and gradually transfers to the other as it unwinds. A ratio of 4:1 from end to end is easily acheived. I have built an EZB version weighing 0.40 g and containing 40' of 0.001 tungsten wire and actually I got it to fly - se FIG. It was fun (particularly when the wire lost tension and

PTO

7-2/86

unravelled!!) but it has all the setting up problems of VP and VD with the extra chore of rewinding (on a jig) between flights ....

PS. I have deliberately avoided any heavy theory or maths, but for those who are that way there are some good articles:

W. Lounsberry NFFS Sympo 1975 pp 98-103

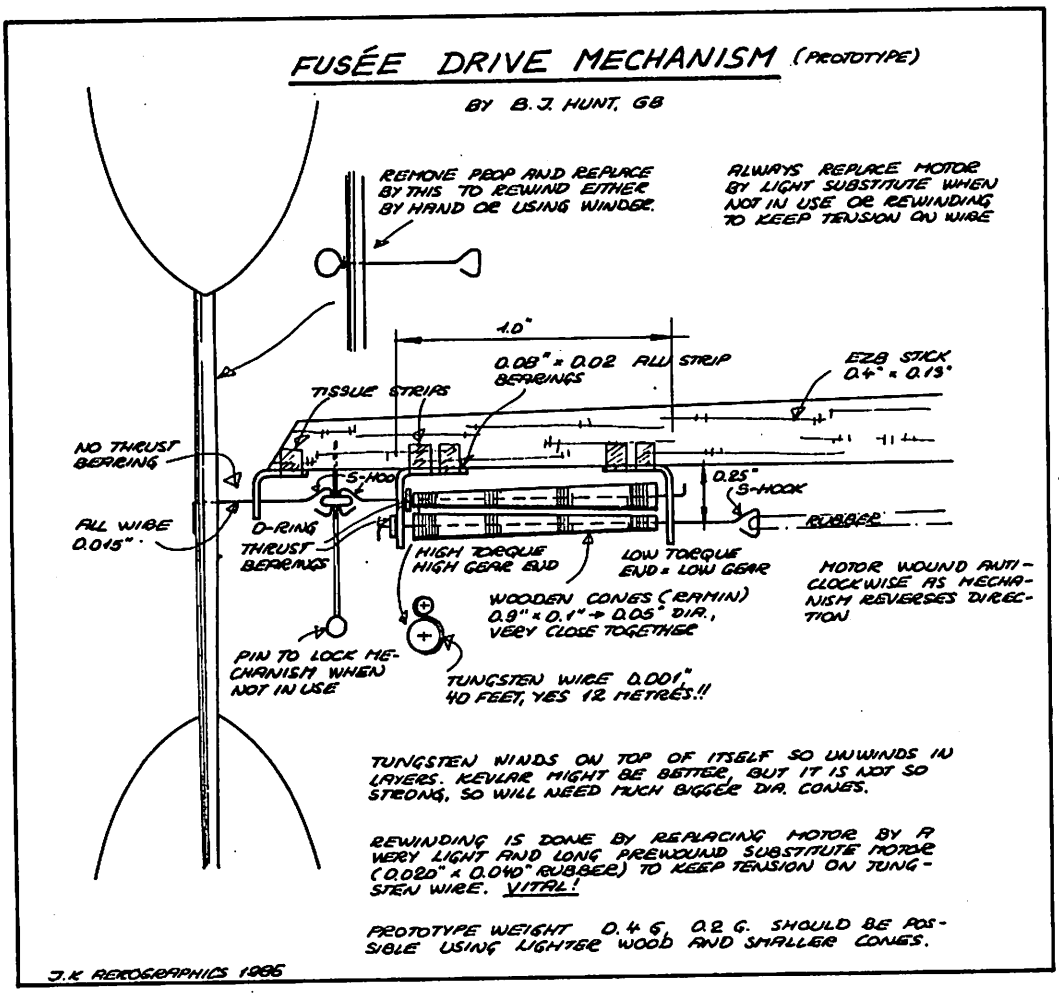
W. Erbach, ibid 1976 pp 47-49

D. McLean, ibid 1976 pp 54-60

Eugene Larrabee, Scientific American, July 1980

OTHER THOUGHTS AND OBSERVATIONS by Bernard Hunt

.....one key principle of indoor duration is that any design layout must use less power (torque and RPM) to be better than an other so if 9" chords are any good they must use less power than for say 8" chords. It is possible (but unlikely) that bigger chord wings use more torque but at lower RPM so that overall they use less power (the same as happens when you trim a model nearer the stall). It is my view based on aerodynamic calculations, glide tests and observed performance at Cardington, that the optimum wing chord is about 8.5" but there are only a few percent difference from 7.5" to 9.5" so I have stayed with the 7.8" I have used for the last 6 years. I am sure Jim Richmond and Cezar Banks will disagree with this, but I think that their improved performance over recent years comes from better props and more skillfull flying. I also think that flight times for indoor CAN be just as misleading as for outdoor - the thermals are there particularly in the late afternoon/early evening and up to 5 minutes "help" is not uncommon so don't be fooled. Dave Pymm and I are non thermal flyers who set up our models to get maximum performance without help and if there is lift we will as likely hit the roof or land deadstick with little benefit. Dave can do about 40 min very consistently and I can do 42 min equally consistently at any reasonable time of the day. On the other hand Laurie Barr and Bernard Aslett are LIFT flyers who have set up their models and flying method to take advantage of late afternoon lift - they use flaring props, very little back off and thinnish motors - so they scratch about during the middle of the day but will quite likely get one really good time late on if conditions come right. It is a method that can work and makes for record times but it is very inconsistent. So when someone says he has done this time or that time, you need to know how and when before considering whether the model design has real worth.



Manny's great questions.....

A) Which combination will result in the longest flight:
1) small rubber with low pitch props
or
2) heavy rubber with high pitch props??

B) What is the best ratio of rubber weight to model weight??

Answers would be appreciated from those who have garnered impirical data or from scientific analytical minds! ADR: 61 SPRINGBROOK ROAD LIVINGSTON, N.J. 07039 USA

???

Finnish Cardington Team:

Leif Englund
H. Erofejeff
Pentti Nore

Team Manager: H. Raulio???

Danish Cardington Team:

Hugo Ernst
Frank Dahlin
Jørgen Korsgaard

Team Manager: Lene Korsgaard

A letter from Ray Harlan ....

.... enclosed a drawing of my model that I've been flying since 1975, often to great success - and sometimes not!

The day of the 47:10, the air was magnificient at Akron. I was quite nonchalant about the flight during the first half, using the time to repair another model. Then, at 25 min., I realised it was still near the top and at 30 min. it was almost 160 feet up and I began to get excited. At 40', it was 80 ft high and I was really jumping!! It landed 2 feet off the floor, against some machinery that I couldn't steer around.

.....

47:10 is really magic ..... JK.

SEE PAGE 14

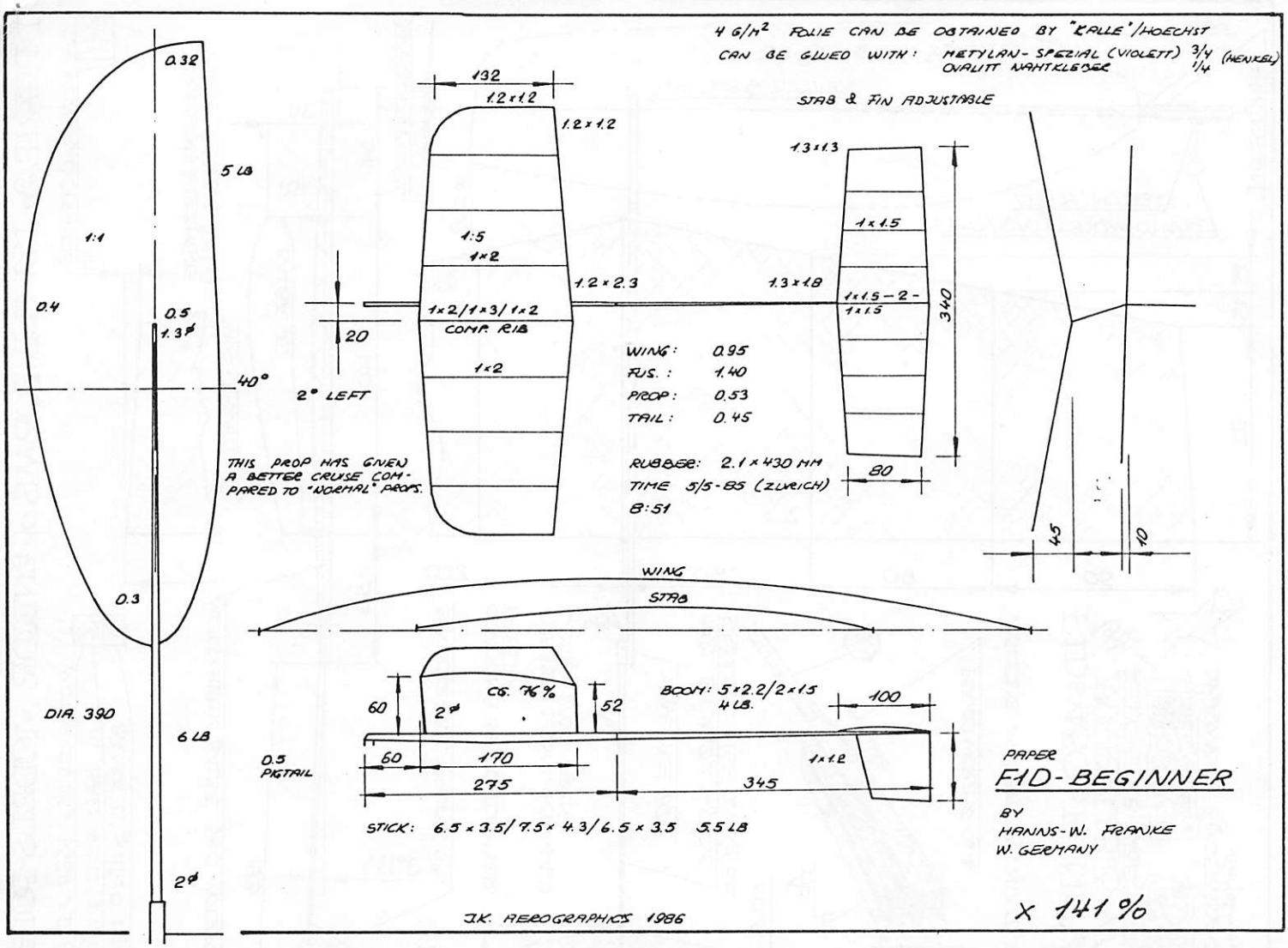
F1D Booklet

The editor of this humble newsletter has offered to produce a booklet - PLANBOOK - of all the W/C models competing at Cardington this year plus some extra from people who cannot go to Cardington for whatsoever reason.

Deadline is July 15th and so the booklet can be ready at the World Champs. Laurie Barr is involved in this enterprise, too.

You can order a copy now, but I cannot tell you the price before August.

8-2/86



RULES, RULES.....

Rumours will tell that we will see a rules changing session at the World Championships at Cardington.
This has made Boyd Felstead sit down and write a letter .....

Reg Parham and Ron Green, UK, have suggested the weight rule for F1D be increased to 1.5 grams!
They feel that those with access to the lightest balsa have an advantage....
In my opinion, everyone has access to light balsa, it is available to everyone from IMS and Micro-X, and everyone with an eye to the future was able to stock up on PIRELLI from Champion, FAI Supply, Che Hobbies and other sources, before it dried up. (What about newcomers??? ... the editor)
I say WIPE ALL THE WEIGHT RULE for F1D. To my mind indoor models' appeal has always been the challenge in building them light. I don't object to the 1 gram rule as such, because building 9" chord models and long models down to 1 gram is building light. 1.5 gram F1D's would be "clunkers" (heavy-weights)!
The need for WEIGHT RULE has now disappeared. The 1 gram models are flying longer than the former NO-weight rulers.
I say ELIMINATE weight rule, but RETAIN the 65 cm span rule. This will mean more scope in design. Some may go back to 5" models weighing 0.020 oz., and compete with today's 9" chord and 0.035 oz models. With NO weight rule we could see 5" chord and short coupled models, 9" chords, 34"-36" long models ... and so on. With all that scope in design (unlike that with the 1 gram rule) it would be very interesting, which design came out on top. And there would be less processing hassle.

I say: WIPE THE WEIGHT RULE! What do you think???

Boyd Felstead, 10 Watson Avenue, Wahroonga, NSW 2076, Australis.

Editorial: In 1975 Manny Radoff suggested 1 gram rubber motors .... and everything else free ....!

Erv Rodemsky's comment to the suggested 1.5 gram rule (via Boyd Felstead):

I think you may be right on doing away with the weight rule, going to 1.5 gram will only make the dammed things grow bigger with more gadgets (VP props etc.).
There's only two ways to prevent the present trend (Swiss type) and that's either specify all dimensions and weight, or go back to unlimited weight. It would really lead to some grotesgue models if we simply increased the weight to 1.5 grams - tandem bi-planes with VP props !!!

PLANS, PLANS!

PLANS

DAVID ARONSTEIN
50 PASTURE LANE
POUGHKEEPSIE, N.Y. 12603
PEANUTS: $1.00 EACH

BOEING MONOMAIL: GOOD INDOOR FLIER, VERY ACCURATE TO SCALE



ETRICH TAUBE: VERY LIGHT, CONTEST PROVEN INDOOR P-NUT, NOT FOR BEGINNERS.



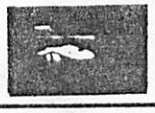
EVANS VOLKSPLANE: CUTE OUTDOOR MODEL IN AUTHENTIC RED BARON MARKINGS.



KIMBREL ULTRALIGHT: TINY BUT WELL PROPORTIONED INDOOR PEANUT.



MINI-IMP: 9" LONG, CAN BE 13" OR 17" SPAN. GOOD FLIER, EYE-CATCHING.



SPORTAVIA RF5: 9" LONG MOTOR GLIDER. GOOD FOR LOW CEILINGS.



SEMI-SCALE PEANUTS: $1.00 EACH

AMERICAN AEROLIGHTS "EAGLE": 12", HAS DONE 30 SEC. UNDER 8' CEILING.



BUHL "BULL PUP": VERY CUTE, AND GOOD FOR LOW CEILINGS.

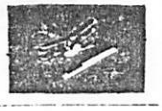


GRAPENUT SCALE: $1.75 EACH

WASPAIR TOMCAT: CANARD ULTRALIGHT CAPABLE OF MORE THAN 40 SEC.



BRISTOL SCOUT D: 6½" SPAN, GOOD FOR VERY SMALL PLACES.



9-2/86

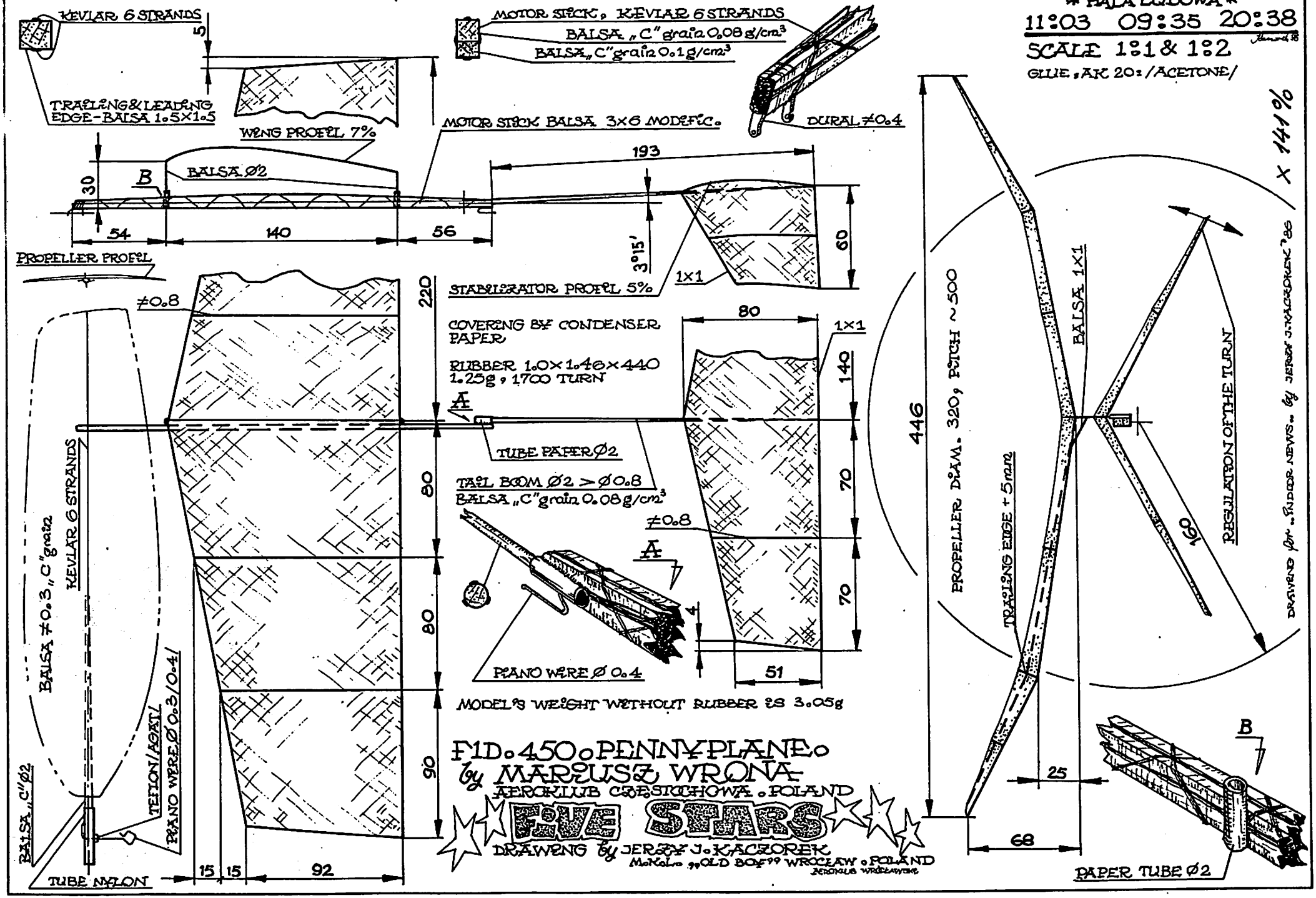
I PLACE in LITTLE FORMS of INDOOR MODELS-POLISH COMPETETION in WROCŁAW '86 APR. 05

* HALA LUDOWA *

11:03 09:35 20:38

SCALE 1:1 & 1:2

GLUE „AK 20" /ACETONE/



F1D. 450. PENNYPLANE.

by MARIUSZ WRONA

AEROKLUB CZĘSTOCHOWA. POLAND

FIVE STARS

DRAWING by JERZY J. KACZOREK

MoKeL „OLD BOY" WROCŁAW. POLAND

AEROKLUB WROCŁAWSKI

DRAWING for „INDOOR NEWS" by JERZY J. KACZOREK '86

× 141%

10-2/86

Royal ANTWERP AVIATION CLUB

LUCHTHAVEN - BUS 8
2100 DEURNE

Modelluchtvaart-afdeling.
Sekret.: M. Huybrechts
Karel de Preterlei, 112
2200 Borgerhout.

" INDOOR " VRY-VLUCHT

Uitslagen van de Internationale wedstrijd van 10 - 11 mei 1986

ingericht door de R.A.A.C. te Antwerpen.

Naam	Club	Vluchten							Plaats
F 1 D microfilm		1	2	3	4	5	6	2 beste	
LIEM. Edm.	Nijm.Lvt.Cl.	21'55"	12'04"	17'46"	19'03"			40'58"	1
VAN HAEREN.	Mod.Vl.Diep.	9'55"	3'24"					13'19"	2
F 1 D beginner - Penny Plane		1	2	3	4	5	6		
LIEM. Edm.	Nijm.Lvt.Cl.	Beg.	7'27"	8'43"	8'27"	8'50"	8'43"	8'42"	17'33"	1
WALGRAEVE	R.A.A.C.	P.Pl.	6'21"	7'01"	7'19"	7'36"			14'55"	2
WEEKENSTROO	K.N.V.V.L.	Beg.	4'32"	5'42"	7'36"	7'02"			14'40"	3
PROOST. J	R.A.A.C.	P.Pl.	6'04"	6'51"	6'47"	7'12"	6'26"	7'27"	14'39"	4
JANSEN. Al.	Win.Lvt.Cl.	Beg.	6'09"	6'26"	7'09"	6'15"	6'39"	6'26"	13'48"	5
VAN HAUWAERT	P.A.T.	Beg.	6'30"	5'40"	5'35"	6'38"	6'34"		13'12"	6
Micro 35									
VAN HAUWAERT	P.A.T.		5'45"	5'47"	5'15"	3'13"	6'10"		11'57"	
E.Z.B. Senior									
PROOST. J.	R.A.A.C.	9'03"	3'15"	9'50"	9'05"	9'03"	10'48"	20'38"	1
WEEKENSTROO	K.N.V.V.L.	10'40"	9'40"	4'40"	8'56"			20'20"	2
VAN HAEREN	Mod.Vl.Diep.	8'34"	8'10"	8'45"	7'52"	8'59"	8'53"	17'52"	3
WALGRAEVE	R.A.A.C.	6'09"	4'58"	6'08"	6'45"	6'15"	3'28"	13'04"	4
JANSEN. Al	Win.Lvt.Cl.	4'37"	5'23"	5'28"	5'25"	5'09"	4'40"	10'53"	5
HUYBRECHTS	R.A.A.C.	2'17"	4'19"	4'41"	4'49"	3'48"	3'25"	9'30"	6
E.Z.B. Junior									
PROOST. Erik	R.A.A.C.	8'17"	8'05"	8'23"	7'35"	8'56"	9'26"	16'22"	1

INDOOR MODEL WORLD CHAMPIONSHIPS—R.A.F. Cardington 1961

1	J. Bilgri	U.S.A.	32:24	6:15	37:49
2	K-H. Rieke	Germany	31:18	—	35:11
3	W. Bigge	U.S.A.	33:07	34:56	29:22
4	E. Hamalainen	Finland	21:34	33:03	27:40
5	**P. Read**	**G.B.**	27:09	32:48	17:46
6	K. Hewall	Germany	1:05	32:00	30:31
7	R. Hyvarinen	Finland	31:02	28:19	14:12
8	C. Redlin	U.S.A.	30:56	18:26	26:55
9	Z. Ocsody	Hungary	25:49	8:20	30:41
10	L. Englund	Finland	30:04	28:35	11:31
11	A. Egri	Hungary	22:51	25:27	27:15
12	**R. Parham**	**G.B.**	15:50	22:01	22:35
13	M. Hacklinger	Germany	4:27	22:21	19:43
14	**R. Draper**	**G.B.**	19:44	20:45	12:55

Team Results

1	U.S.A.	103:41
2	Finland	94:09
3	Germany	89:32
4	**G.B.**	76:08
5	Hungary	57:56

25 YEARS AGO.....

11-2/86

CARDINGTON! ENTRY FORM CARDINGTON!

British National Indoor Model Championships to be held on Saturday 31st August & Sunday 1st September 1986.
Entry and competition in this event is open to any model flyer from any Country, at Cardington Airship Hangers.

Saturday 31st August 1986

Events: (1) E.Z.B.
(2) Peanut Duration
(3) Manhatton 4g & 6g
(4) C.O.2. Duration
(5) Novice Penny Plane

Note! Some Countries have different rules, but any EZB is allowed, but no wire bracing of flying surfaces is allowed.

(6) All in scale Contest. Any size, any power unit (i.e. C.O.2/Rubber is OK), flown to Miami rules, Contest Director Butch Hadland!

Sunday 1st September 1986

All Microfilm models

Events: (7) Open
(8) F.1.D.
(9) 35 c.m. wingspan.

NOSTALGIA

INDOOR NATIONALS — Corn Exchange, Manchester—February 13th/14th, 1960.

Microfilm (13 *entries*)

1	Parker, G.	Teeside	10 : 02
2	O'Donnell, J.	Whitefield	8 : 11
3	Grimmett, M.	West Brom.	7 : 46

Paper (13 *entries*)

1	Parham, R. T.	C.M.	8 : 08
2	Jukes, B.	Birmingham	7 : 58
3	Barnacle, E.	Leamington	7 : 35

Chuck Glider (33 *entries*)

1	Ellison, J. T.	Whitefield	0 : 38
2	O'Donnell, H.	Whitefield	0 : 37
3	Freeston, G.	Sheffield	0 : 30

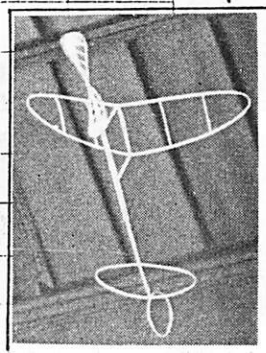
This is a special event for those wishing to either stay on to the week-end after the World Championships, or those who come just to fly the week-end 31st August - 1st September.

The same 1st class food & accommodation is available at £28 per person, as for the World Championships.

Send your entries as soon as possible to:

Laurie Barr,
4, Hasting Close,
Bray ,
Berkshire.
England.

Name	1	2	3	4	5	6	7	8	9



Dutch results and the team for Cardington '86:

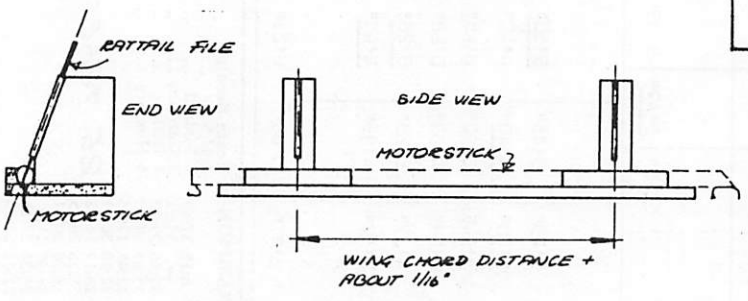
The dutch team trials were held on two separate days - in June '85 and in March '86 - and flown in the big hangar at the Schipol Airport. It has a 25 m ceiling. The best result of each day are counted for the end result.

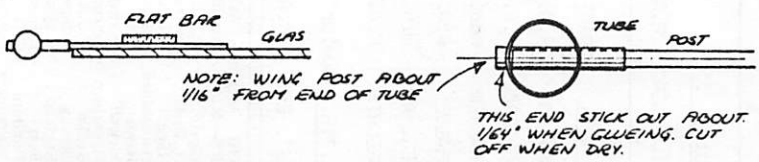
1.	Otto Rodenburg	34:45	+ 34:15	= 69:00
2.	Edmund Liem	32:29	+ 28:40	= 61:09
3.	Thedo André	30:09	+ 29:46	= 59:55
4.	Wim Beekmeyer	28:49	+ 26:24	= 55:45
5.	Kees Wolthoorn	27:41	+ 0	= 27:41

Number 1,2 and 3 are the team members. T. André is now for the first time in the team for indoor.

A new "wrinkle" from Manny Radoff ... or an updating, as he calls it!

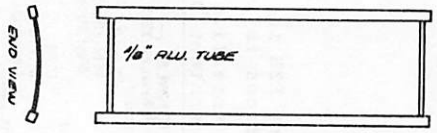
Since the early 1970's I have learned about small round files known as "rat tails". I purchased two that were a slight bit larger than 1/16" in dia. I now use these files to make holes in the motorstick to accept the tissue tubes. I learned about the files when Bernard Smith of Australia told me about his Handy-Dandy jig for making the holes correctly aligned.
The drawing gives you an idea of the look of the jig. The tube through which the rattail files go can be any material you have which will hold the files fairly snugly. I did'nt have any metal or plastic tubes so I made my own out of paper and white glue rolled around the files. The files are not perfectly straight, so my holes come out slightly oversize - a bit of a blessing, since my balsa pieces that hold the tubes for the files are not exactly the same angle as I make everything by hand, the holes are not exactly lined up. Even if they were in the beginning the balsa base could and does warp after a time. The slightly oversize holes permit me to align the tubes correctly. I do that in the following way:
I mount the tissue tubes on the wing posts, insert the tubes into the motorstick with the posts and then put a bit of glue on the top and bottom of the motor stick at the tubes. With the wing posts still in the tubes I put a piece of glass at the end of myworkbench, put the wing posts at the glass with the motorstick over the end. Then I place a perfectly flat metal piece on the posts. This perfectly aligns them in the plane of the glass. Of course align the posts so that they are parallel. When the first light coat of glue on the tubes is dry, put on another light coat and replace on the glass 'till dry again.
The tubes go through both sides of the stick. No problems have arisen because the tubes are open at the bottom, probably because the posts usually go through to the bottom.





Airfoil microfilmframes .... Dick Obarski.

Slack film on frames by using frames with 1/8" dia. soft aluminium ends and bend to airfoil curvature after film is cured

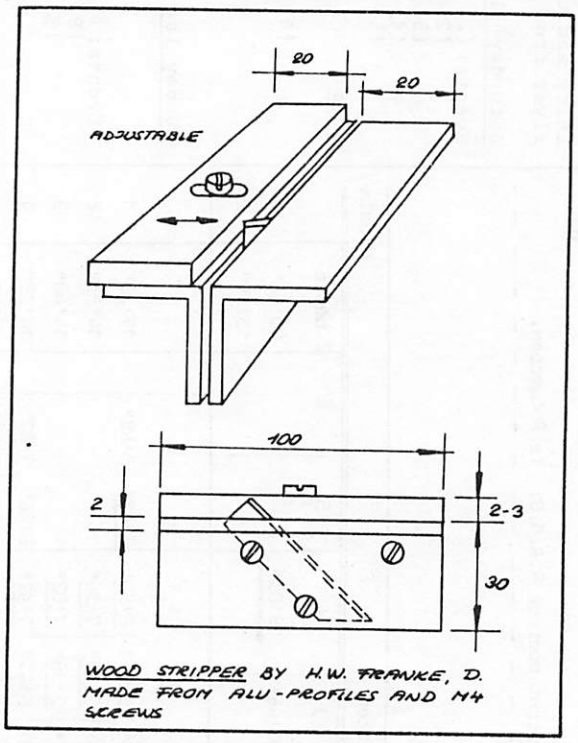


Apply bracing wire to wings by using light weight fixture (jig?) of foam and balsa, glue one and of wire to wing post and add small paper clip to other end of wire, pick up fixture with wing over tacked in place. Let the paper clip hang in mid-air (which keeps a constant tension on wire) and string wire on wing attachment points by rotating fixture. - You may need a stepladder or a chair to stand on.

Web slotting jig for motorsticks:

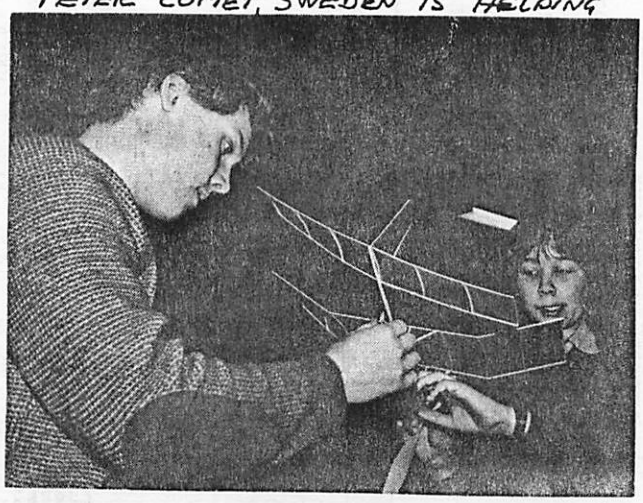
By Manny Radoff.

I use a a slotted bar which just fits inside of my size motorsticks. I have 14½, 15, 16 and 17" bars with slots on both ends which are cut exactly parallel to each other. I insert the bar inside of the stick and align it so that the slots will be where I want them. I hold the motor stick on the bar in one hand and turn the hand for cutting each slot. I use a razor saw to cut the slots



WOOD STRIPPER BY H.W. FRANKE, D. MADE FROM ALU-PROFILES AND M4 SCREWS

PETER COMET, SWEDEN IS HELPING



POLISH COMPETITION LITTLE FORM INDOOR MODELS 05 APRIL 1986

WROCŁAW • HALA LUDOWA •

* SZYBOWCE • INDOOR HAND LAUNCH GLIDERS •

SENIORS				
1. J. SIERPOWSKI	Aer. Wrocławski	44.1	42.1	86.2
JUNIORS				
1. A. PRESZNER	Aer. Wrocławski	37.2	36.1	73.3
YOUNGS				
1. M. HRYCIAK	Aer. Wrocławski	41.0	35.0	77.0
			COMPETITORS 15	

* F1D • 450 • PENNYPLANE •

SNR				
1. M. WRONA	Aer. Ogniochana	11:03	09:35	20:38
JNR.				
1. J. DRZEWIECKI	Aer. Ogniochana	07:43	07:09	14:52
YOUNG				
1. A. PERUS	Aer. Ogniochan	05:15	05:59	11:14
			COMPETITORS 30	

ORGANIZER: MKL 99 OLD BOF 99 & MDK im. M. Kopernika WROCŁAW • DRAWING for 99 INDOOR NEWS 99 by JERZY J. KACZOREK MKL 99 OLD BOF 99 W-W POLAND

TOTAL COMPETITORS 80

* ESB • EASY-B •

SNR				
1. R. CZECHOWSKI	Aer. Krakowski	11:12	11:02	22:14
JNR				
1. D. SKOCHLAS	Aer. Bielsko-B.	06:27	04:45	11:12
YOUNG				
1. J. POWROŹNIAK	Aer. Krakowski	03:32	05:11	08:44
			COMPETITORS 9	

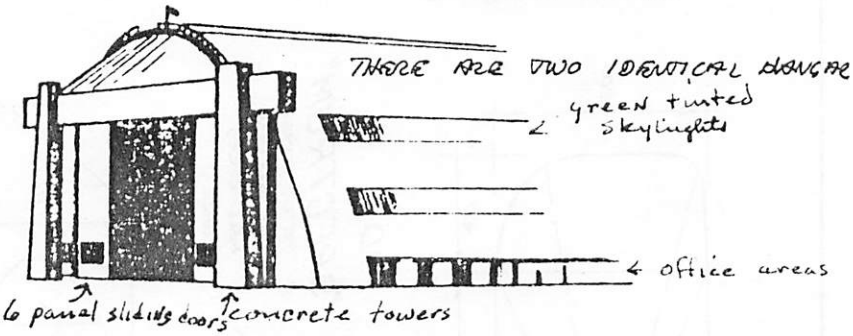
* ORZESZKO • PEANUT SCALE • 330 •

SNR					
1. S. KUJAWA	SOLAR CHALLENGER	Aer. Poznański	78.0	84.0	70 232.0
JNR					
1. R. COSTA	FOX	Aer. Poznański	44.9	05.0	50 099.9
YOUNG					
1. J. SUCHAR	PRÄTUS FOCKER	Aer. Wrocławski	185.4	175.0	20 380.4
				COMPETITORS 17	

TOTAL COMPETITORS 80

FAMOUS SITES! SANTA ANA

BY STEVE BROWN



Dec. 9, 1985

SIENOR 8/1-86

Dear Jorgen,

Thank you for your letter of Nov. 22. I've been quite busy beginning a new job recently so have not done as much building as I had been. Fortunately I did finally get some solid info on the Santa Ana Dirigible hangers after getting a lot of misinformation from various people. I obtained the following from a US Marine Corps publication:

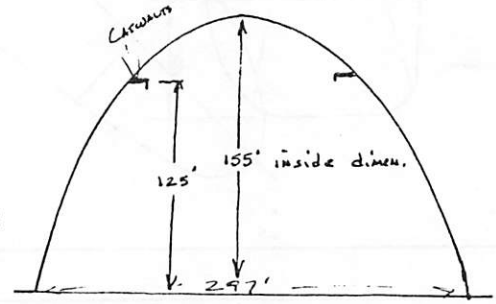
external dimensions

length: 1,088'

height: 178'

width: 297'

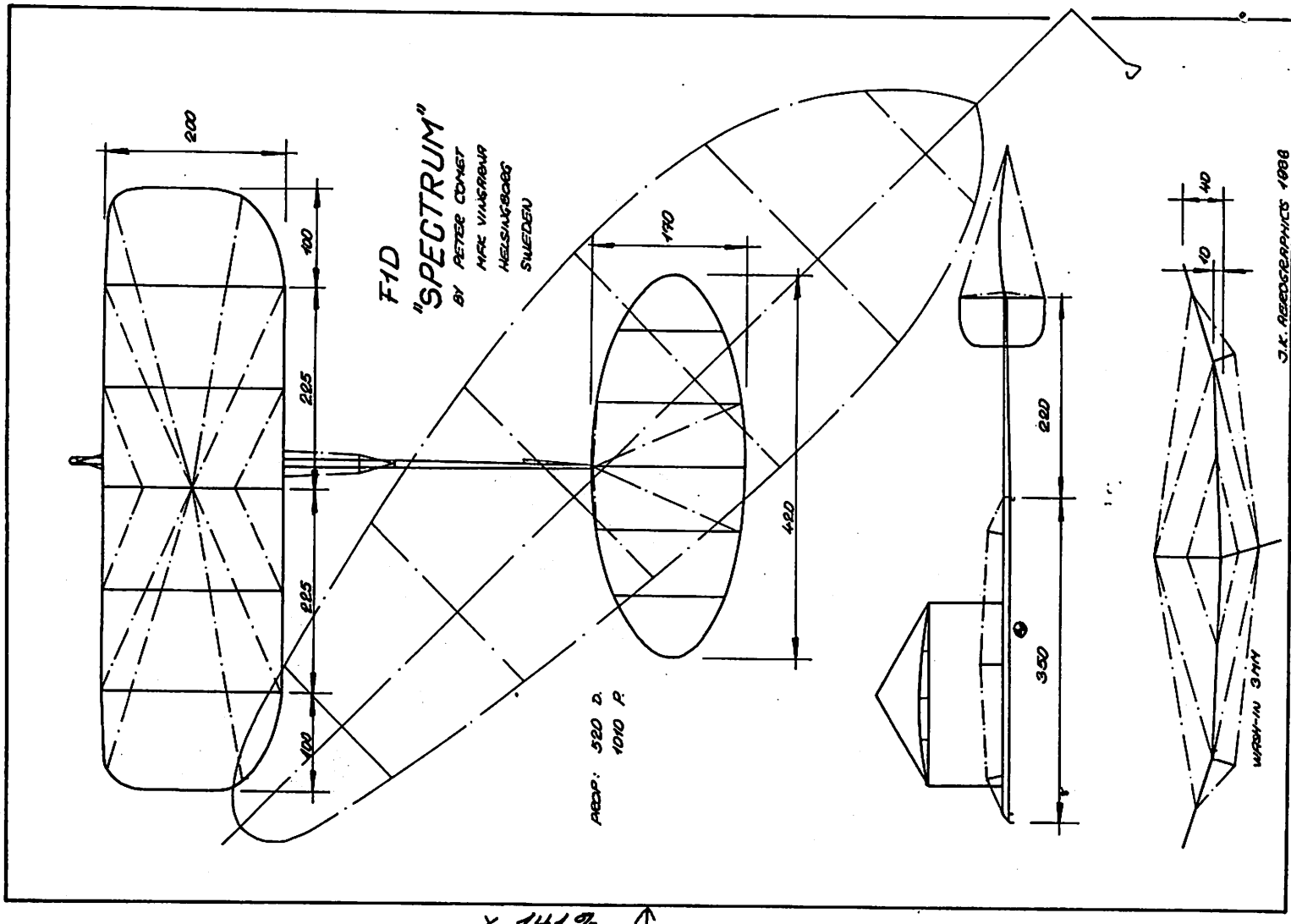
floor area: 298,000 sq. ft.



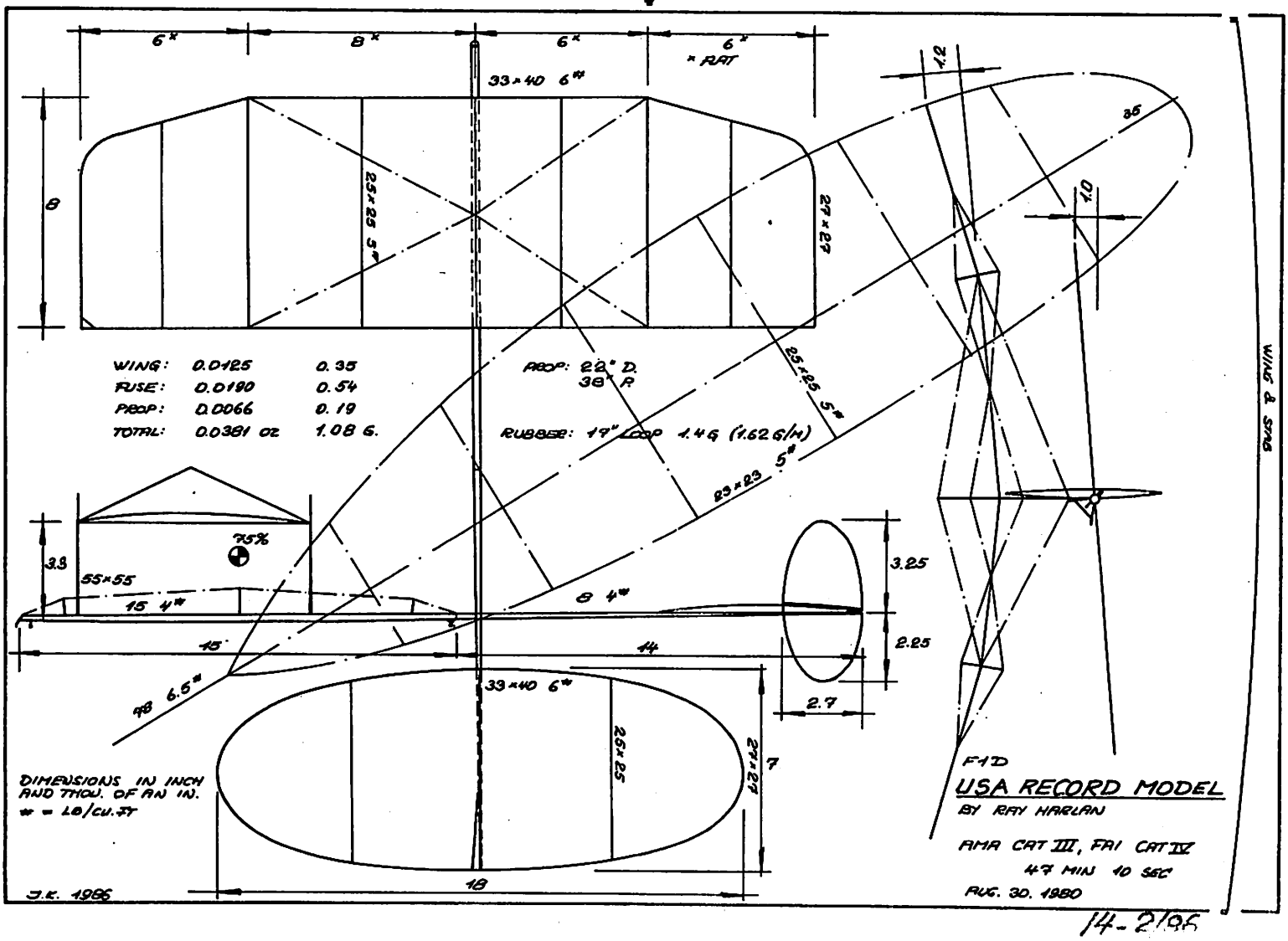
The hangers at Santa Ana were built in 1942. They were part of a series of identical hangers built at 10 locations in the U.S. to house anti-submarine patrol Blimps (6 each hanger) during W.W.2. They are considered the world's largest all-wood structures. I had thought that they were built in the 1930's (as were Lakehurst and Akron) to house the large US Navy rigid airships but they weren't. Lakehurst & Akron are somewhat taller and are primarily metal buildings. Photos of the hangers are discouraged but I am enclosing a photo-copy of this crude sketch - courtesy the US Marines! Both hangers are identical (there is another pair at a Naval Aeistation near San Francisco, Calif.) and are currently used to house Marine helicopters under repair.



HUGO OF DENMARK 13-2/86


F1D
"SPECTRUM"
BY PETER COMET
MAX VINGBUAR
HELSINGBORG
SWEDEN
200
100
205
225
100
140
420
320 D.
1010 P.
220
350
40
40
J.K. ABERGRAPHICS 1988
MHG MI-HORN

× 141%


6"
8"
6"
6"
+ RAT
33×40 6"
8
25×25 5"
24×24
WING: 0.0125 0.35
FUSE: 0.0190 0.54
PROP: 0.0066 0.19
TOTAL: 0.0381 oz 1.08 G.
PROP: 22" D.
38" P.
RUBBER: 19" LOOP 1.4 G (1.62 G/M)
25×25 5"
23×23 5"
1.2
35
1.0
3.8
75%
55×55
15 4"
8 4"
15
44
48 6.5"
3.25
2.25
2.7
33×40 6"
25×25
24×24
7
18
DIMENSIONS IN INCH AND THOU. OF AN IN.
* = LB/CU.FT
J.K. 1986
F1D
USA RECORD MODEL
BY RAY HARLAN
AMA CAT III, FAI CAT IV
47 MIN 10 SEC
AUG. 30. 1980
WING & SPAR

14-2/95

KIMBERLY

SKY RIDER

P-NUT SCALE

13" SPAN OR 9" FUSE. LENGTH.

9" Rumpflange

ENLARGE 141% AND YOU HAVE A QUILD. DW

MODEL FLIES TO THE RIGHT.

1:1 X 141%

HANG GLIDER COLOR SCHEMES ARE USED ON ULTRALIGHTS

MODEL IS WOUND FROM REAR USING DTHS-A AND PROTECTION TUBE AND WINDING ROD TO PROTECT MODEL

WINDING SLEDGE

1.5Ø WIRE

CLAMPED TO THE DRILL

ALL SURFACES ARE COVERED ON ONE SIDE ONLY WITH CONDENSER TISSUE

RIB TEMPLATE

Australisches Ultraleichtflugzeug

MODIFIED BY JÜRGEN WEIL, W. GERMANY

39

28

30° PITCH

PAPER TUBE 1.5Ø I.D.

16

10

0.4Ø WIRE

15°

CORK TIN

1.5Ø hart

PROPELLER 0,6 mm C grain

WEIGHT: 25 GRAMS

POWER: PIRELLI RUBBER

1x1.3 MM, 320 MM LENGTH

≈ 1580 TURNS.

BASIC FUSELAGE FRAMEWORK

3° Rechtszug / RIGHT

0° Down

Ø = ROUND

STABILIZER

NO COVERING

Hier nicht bespannen

0,7x0,7 A

L.E.

DO NOT COVER THIS SECTION

DOCUMENTATION OBTAINABLE FROM:

JURGEN WEIL

WILL. LEUSCHNERSTR. 17

D-6054 RODGAU 5

W. GERMANY

0,8 L 0,8 B-grain

T.E.

1,5x1,8 grain Ø

0,6x0,6 B

Papierröhrchen (Faden durchziehen)

PAPER TUBE

0,6x1 C

L.E.

0,8x0,8

L.E.

WING - 1/2" DIHEDRAL

Vorderkante

MODEL WEIGHT ≈ 2.5 G. IT DOES 80 SECS REGULARLY

BRACING POST OFFSET FOR RUBBER CLEARANCE

Teflon Scheibe

THREAD Nähgarn grau

1,5x1,8 grain

0,7x0,7

0,7x0,7 B

2,4 x 4,8 mm C grain

0,5

SKY RIDER

Ray Harlan Seilflugtag.

1,2Ø

+2,5°

1,2Ø

Strebe seitlich am Rumpf befestigen (weg Gummi)

1,2Ø

1Ø Balsa ADJUSTABLE STAB.

Papierröhrchen am Seitenleitwerk befestigt

Herdrehen Mehrfachbiegen Verstellbar

1,5Ø

Balsa

UHU

Draht 0,2 mm Ø

Bohre leicht

Papierröhrchen

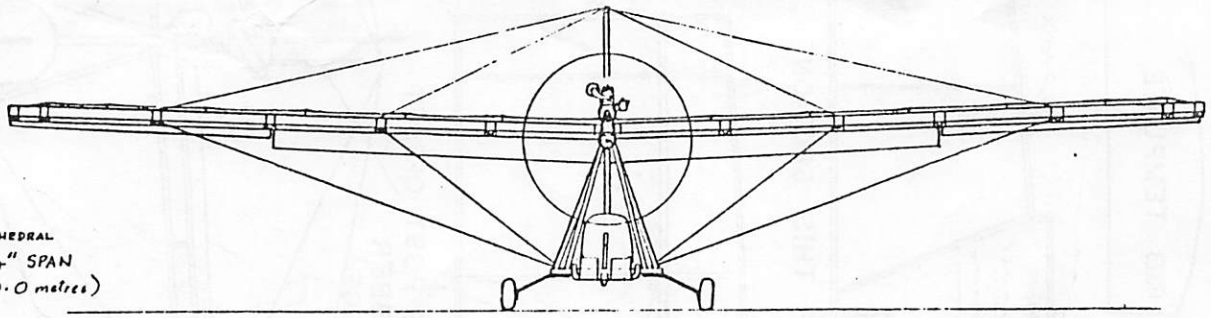
SIDE VIEW (LEFT WING OMITTED FOR CLARITY)

Tropfen UHU hart

GLUE DROP

.010" WIRE

ORIGINAL DWG FROM
DAVID ARONSTEIN
50 PASTURE LANE
POUGHKEEPSIE, N.Y. 12603

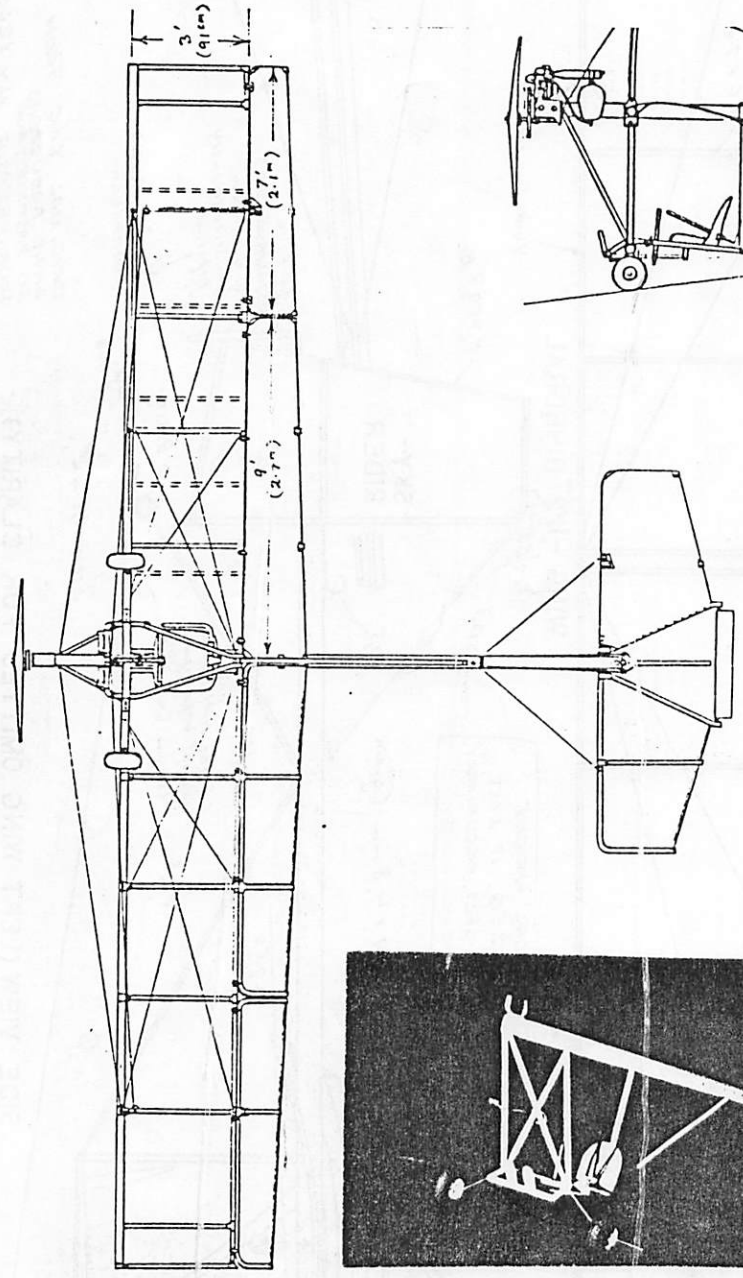


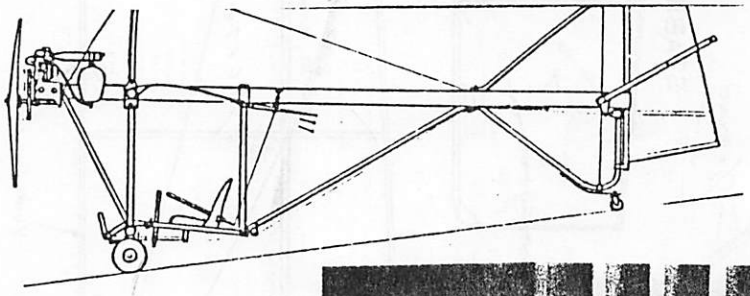
2° DIHEDRAL
32' 4" SPAN
(10.0 metres)

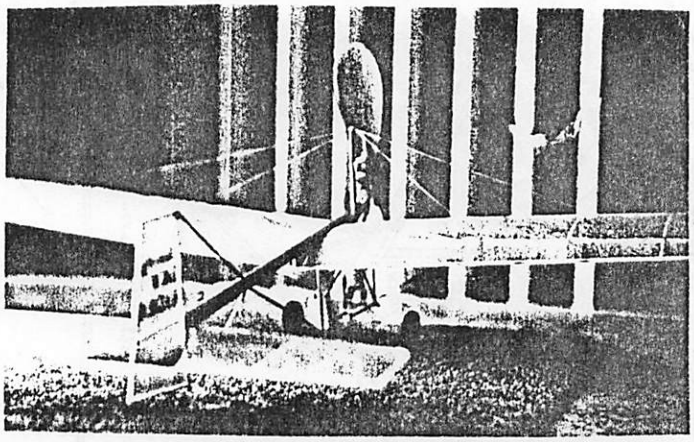
SCALE : 1 CENTIMETER = 1 FOOT (APPROX.)

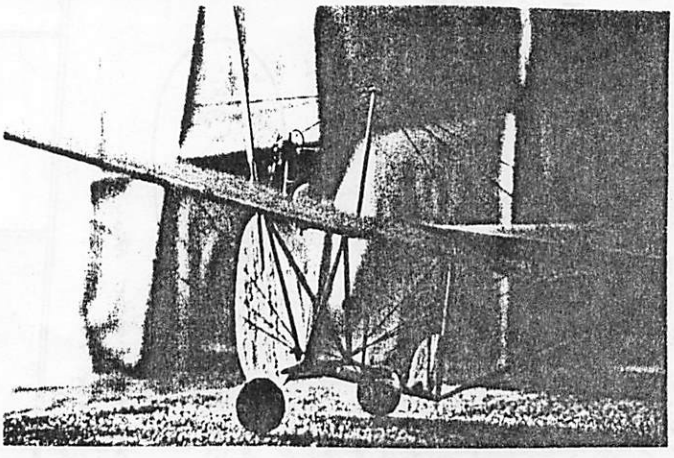
KIMBERLEY SKY-RIDER		
SIDE + FRONT ELEVATION		
DRG. NO. 1	DRAWN BY G.K.	DATE OCT 1977

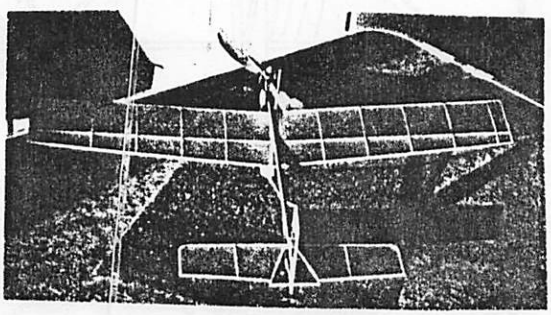
Amateur home builders are reminded of the experimental nature of the Sky-Rider design and are urged to seek expert advice in areas where any uncertainty is felt to exist.



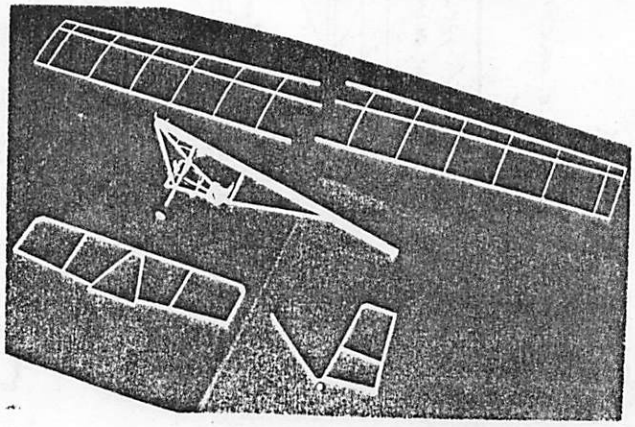








PICTURES BY
J. WEIL



16-2105