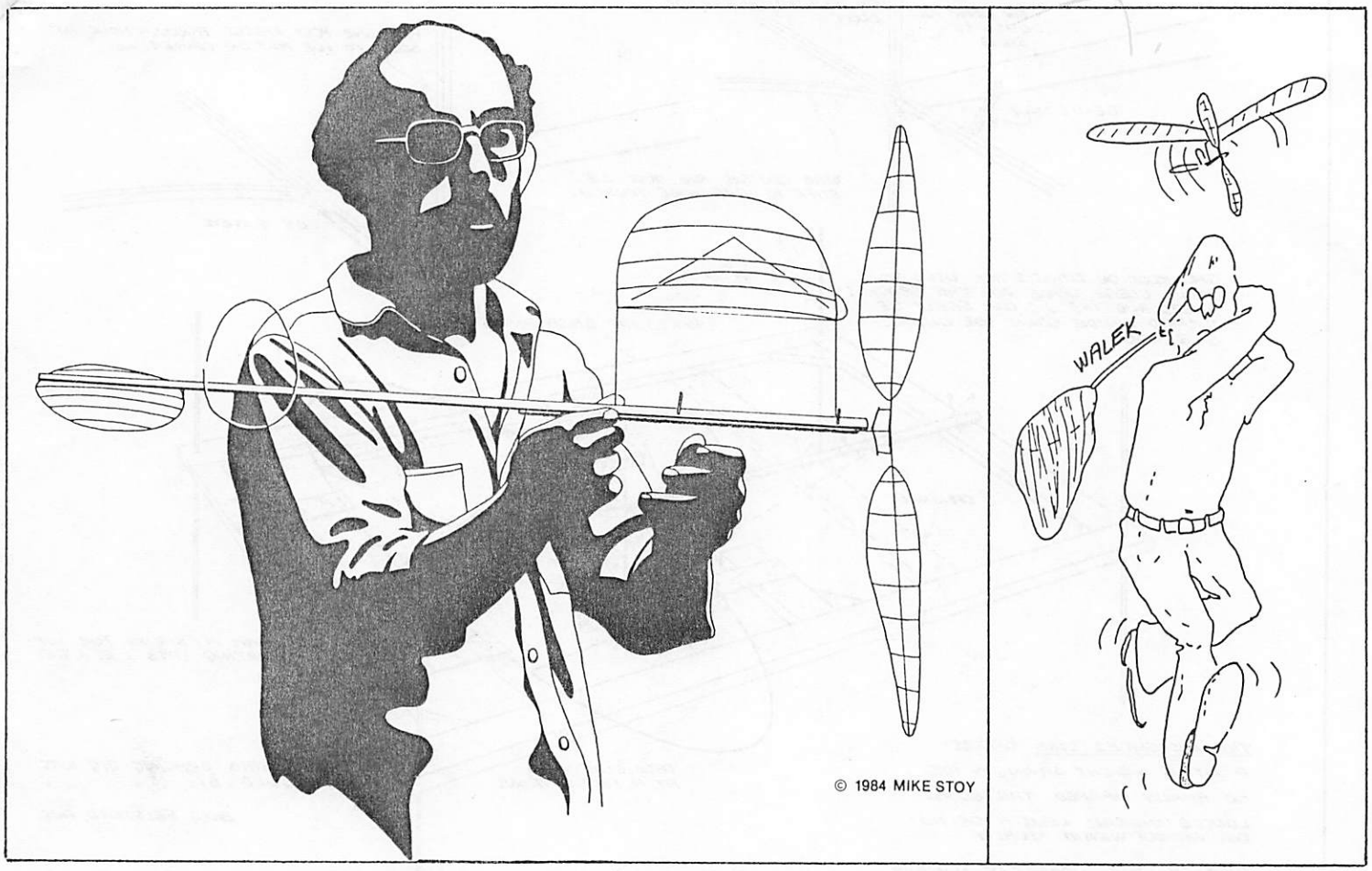


INDOOR NEWS · 1 · 1986

Dear friend,

This year will see the F1D World Championships in the great airsheds of Cardington and I'm hoping that real many teams will show up there in August. Denmark is going to send a full team for the first time ever, but the Australians have their problems of getting the money for the aound the World trip - I cross my fingers hoping they'll manage...

This issue is stuffed with material, I got so much that it has not been possible to contain it all, but wait and see the next issue. One reader complained over the reduced scale drawings in the last issue, and this time the drawings have been reduced again in order to stuff as many as possible. The drafting procedure is to fill a piece of DIN A-4 paper and then reduce it to 71% on a copy-machine, and this means that I can have two dwgs on one piece of paper! If YOU want sections and prop shapes in full size - and this time the peanut model - then find a copy-machine which can enlarge by 141% and you have the size of dwg that I - or others - actually did. VOILA! I'm asking for your understanding of this problem....

In issue 20/21 (double issue) of Indoor News And Views there is an article about the safety while building - remember all the dangerous fumes you breathe, the balsa dust, Boron filaments, cyano... and the sharp cutting tools ....

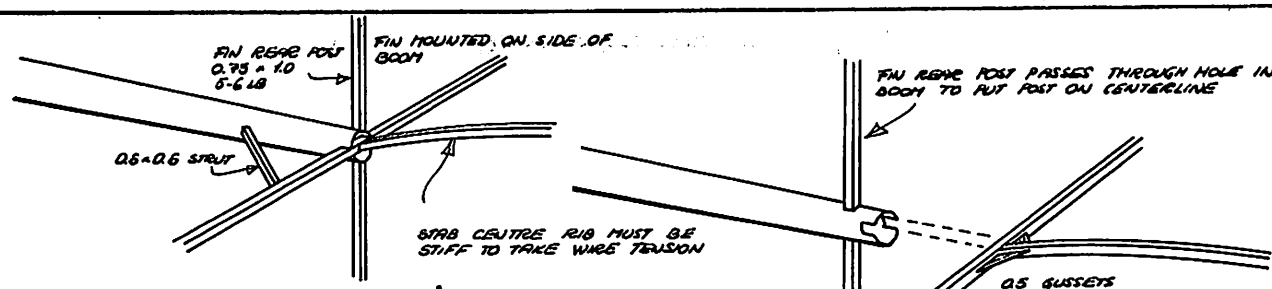
Please, be careful, will you .....

EDITOR and DRAFTSMAN:

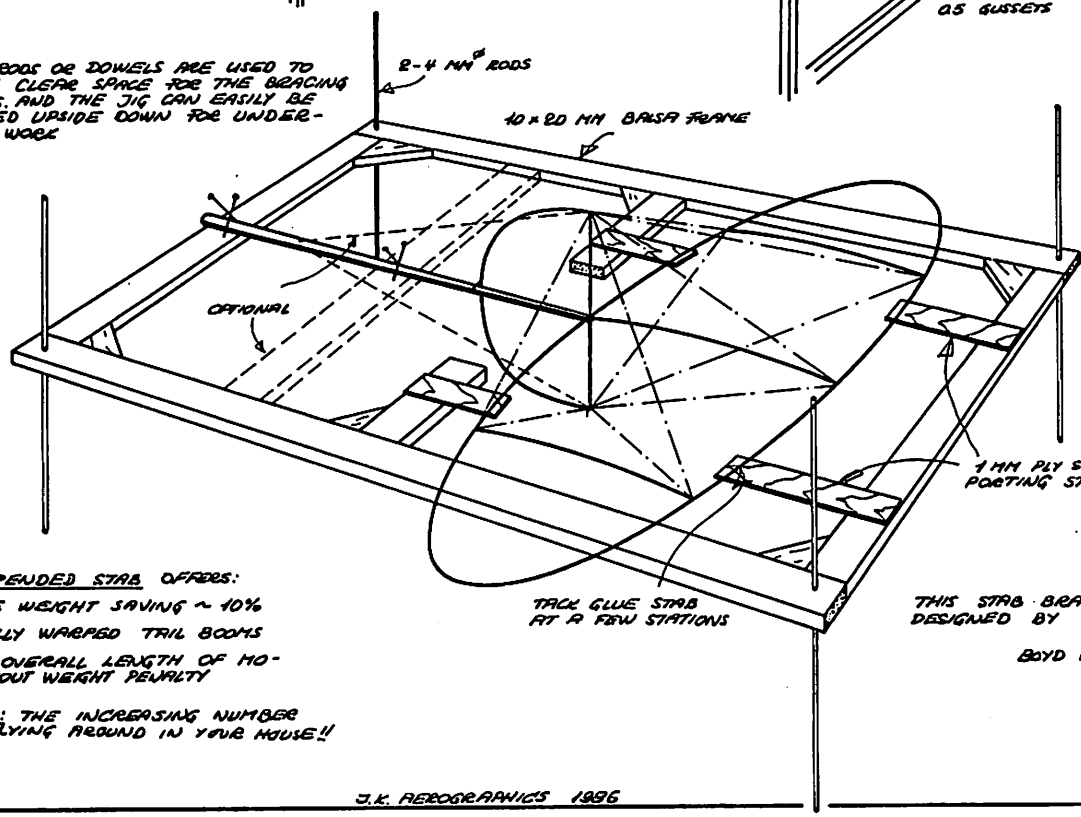
Jorgen Korsgaard
Ahornweg 5
D-2397 Ellund-Handewitt
W. Germany

Phone 04608-6899

3 issues, will appear around March, July and November.
Scandinavia 45,- Dkr
Europe 50,- Dkr
Airm. outside Europe 60,- Dkr



THE BOOS OR DOWELS ARE USED TO MAKE CLEAR SPACE FOR THE BRACING WIRES, AND THE JIG CAN EASILY BE TURNED UPSIDE DOWN FOR UNDER-SIDE WORK



THE SUSPENDED STAB OFFERS:

A LITTLE WEIGHT SAVING ~ 10%

NO REALLY WARPED TAIL BOOMS

LONGER OVERALL LENGTH OF MODEL WITHOUT WEIGHT PENALTY

PROBLEM: THE INCREASING NUMBER OF JIGS LYING AROUND IN YOUR HOUSE!!

THIS STAB BRACING JIG WAS DESIGNED BY

BOYD FELSTEAD, AUS.

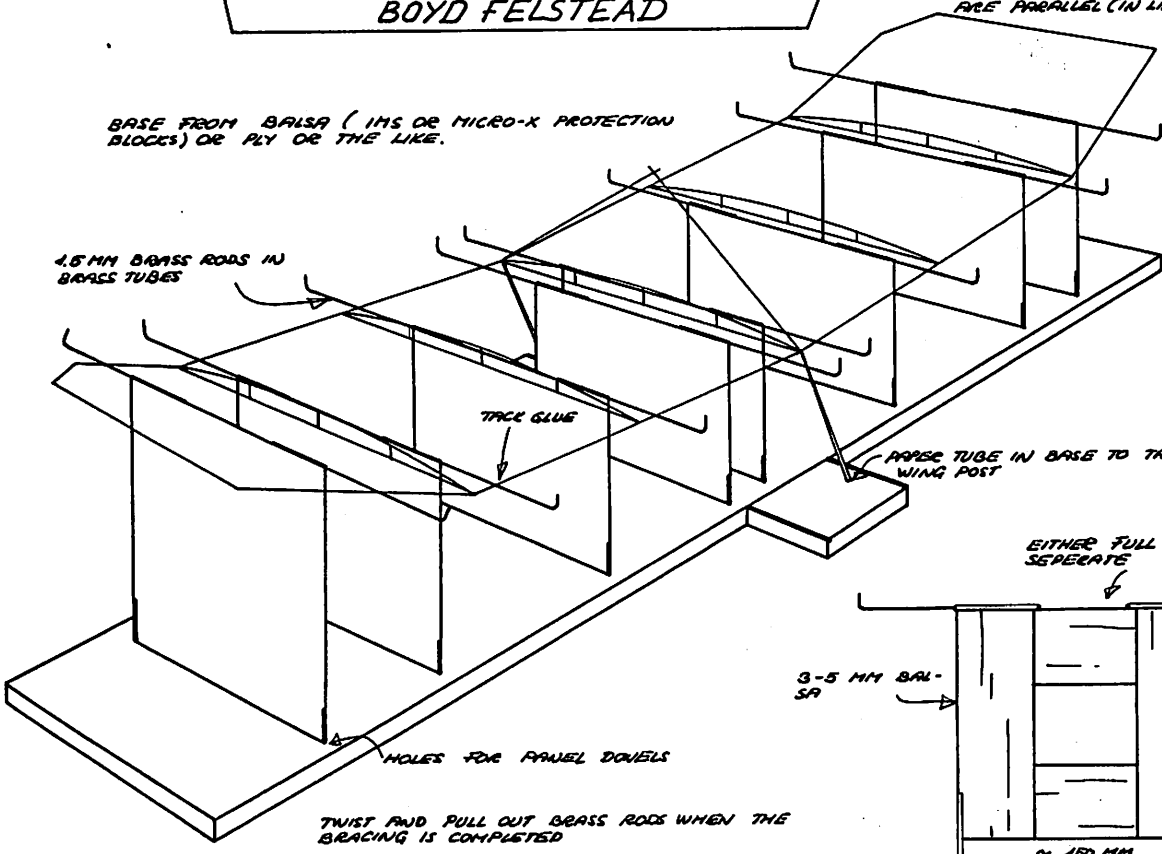
J.K. AEROGRAPHICS 1996

COLLAPSIBLE, FOLD AWAY

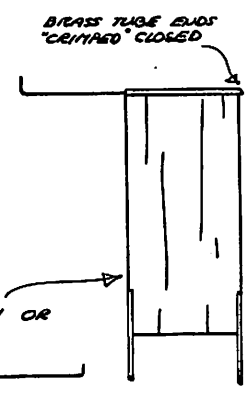
THE ULTIMATE WING BRACING JIG BY BOYD FELSTEAD

THIS TYPE OF JIG GIVES A BETTER VIEW OF SPARS & WING POSTS, SO THERE IS A BETTER EYE-CHECK OF WASH-IN AND THAT WING POSTS ARE PARALLEL (IN LINE) COMPARED TO JIG WITH SOLID SIDES.

BASE FROM BALSA (IMS OR MICRO-X PROTECTION BLOCKS) OR PLY OR THE LIKE.



TWIST AND PULL OUT BRASS RODS WHEN THE BRACING IS COMPLETED



J.K. AEROGRAPHICS 1996

Bernard Hunt has sent me some very comprehensive letters.....

.....Boron has been available in 0.006" as well as 0.004" and I was given a very small amount of the thicker stuff by Dieter Siebenmann some years ago, but I do not know if it is still available. Sizes thinner than 0.004" are obtained by etching but this is a dangerous process only suitable for professional chemical laboratories. Do not worry though because 0.004" is ideal for most indoor uses and I only gain a very marginal weight advantage from the thinner stuff.

.....13" span IHLG models. This class was introduced for our low ceiling contests a few years ago (I wrote the rules/specification) to try and make the flying of indoor HLG easier for non-experts. At that time, most people were flying variations on the American Mark Drela's "UPSTART" design which is difficult to build and trim and requires a strong arm to be competitive. The specification of 13" span and 3 g min. weight was chosen, so that the models could be thrown to the roof (8 m) by average flyers and did not need super wood, carbon fibre etc. Another advantage was the smaller flying circle. The best times are 30-32 sec, but many people can manage 28 sec. The model designs are all very semilar (the rules force this by limiting wing and tail spans and areas and overall length and weight) and are close to copies of Stan Stoy's "COOT" design with the wing clipped a little and the tail span increased a little.

.....Finally I thought I might offer a few words about rubber quality. The only stuff that I have found suitable for indoor use is Pirelli and all made between 1978 and 1982 (when I think produktion stopped) was good. The normal grey FAI Supplies rubber is quite hopeless (forms sideways whiskers on winding and gives too much power on full turns and too little near the end). Older Pirelli was of variable quality and by now will have hardened and become less reliable (breaks unexpectedly at less than full turns). Rubber stored in the deepfreeze stays unchanged indefinitely.

Many good indoor flyers claim that this batch or that batch of rubber is fabulous, but I have tested dozens of different identities of Pirelli and found that there is rarely more than 5% difference in onergy storage between them. The difficulty with rubber motors for indoor duration is that you MUST have the right size for the model/site/conditions. It is too easy to blame the rubber when you get it wrong. Rubbers of the same onergy differ in hardness (hard gives less turns but more torque) so you have to adjust rubber size accordingly. Furthermore, because every time you wind a motor hard it stretches and behaves like a longer, thinner piece (more turns, less torque, but the same energy)it is tempting to think that the rubber has "gone-off" after a few winds. The key to handling rubber motors for indoor is to have a completely reproducible technique and meticulous recording. For a period of 2-3 years, in the quest for consistency, I used to use only one rubber batch and size and fly with a rubber motor once (after break in) then throw it away. Now I feel confident enough to vary things a bit and use motors 6-8 times for economy.

A final comment, it is perfectly possible to standardise on one rubber size for F1D and EZB - 1.45 g per meter - about 0.055" - and alter the motor length to get the model/site/conditions match. If you are short of rubber or do not regularly have access to a stripper, this approach works OK. The only minor inconvenience is that you have to correct for small changes in CG position. Well, Jorgen, that's it. I hope you find some of this suitable for publication.

Bernard

Indoor Model Supplies

Lew Gitlow has sent out a new catalog presenting some new items plus all the usual very good stuff... New things are for instance a new glue gun, 6 mm masking tape, scale instrument sheets, teflon tubing for slicing your own washers, plasticizer for making your own microfilm formula etc. etc.

Box 39, Garberville, Ca. 95440-0039, USA

BOOM, I HLG & ELASTIC STORIES BY BERNARD HUNT

About winding ..... by Bernard Hunt.

..... I break in motors on the day of the contest and do not find it necessary to allow time for the rubber to recover. I break in motors by stretching to five times original length, then winding first to 50 % of calculated maximum turns - I use a pocket computor to compute turns and torque - holding for one minute before unwinding.

I then wind on 70 % turns - carefully at the end, because the motor will be very tight - hold for one minute and unwind. The motor is then ready for contest use, when I again wind on 70 % of max. turns at five times stretch - checking that the torque is what I would expect for the motor size - before slowly and evenly coming in to get full turns and torque.

I use motors time and time again providing that the max. turns are what I want for a particular flight, BUT everytime a motor is hard wound it stretches and behaves like longer/thinner piece on the next wind - energy is no different - so care is needed.

I tend to use slightly thick motors at the cool start of the day which will be just right for warmer conditions later after a series of hard winds. I cannot stress too strongly the importance of exactly the "right" motor for indoor flying, and this means the right size and extent of break-in. Actually, if I don't have the exact size of motor that I want, I often underbreak in a thin motor or hard break a thick one. Another way is to change the length a little. A good rule of thumb for best times is to choose a size which gives the same number of turns left on landing as are backed off - no touch 8 m ceiling 20 %, Cardington 5-10 %

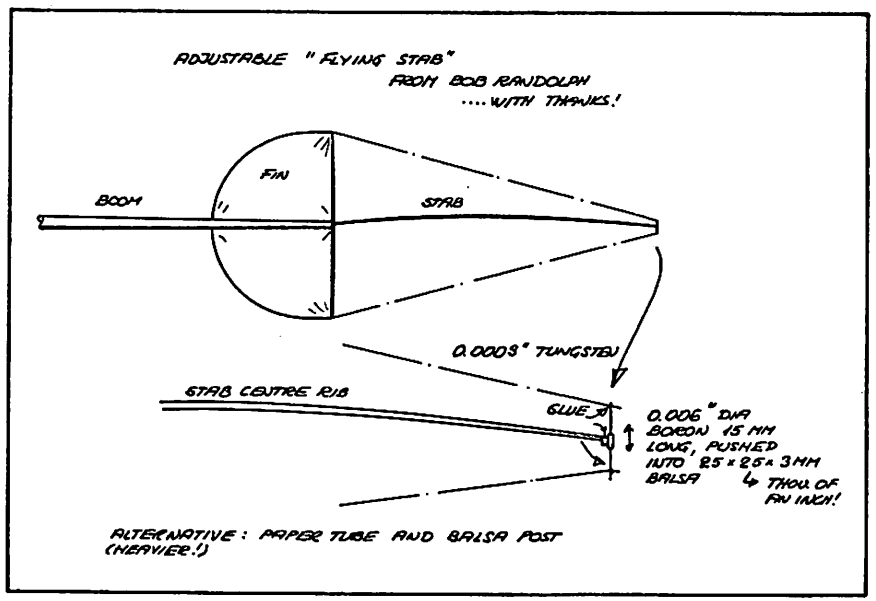
Maximum turns....

This formula was found in a book. It might be useful for someone, others prefer to break a motor to find max. turns ...

L= length of motor in mm Q= weight of motor in gms

K= is a constant depending on rubber quality, it lies between 0.2 and 0.3

$$N = K \cdot \sqrt{\frac{L}{Q}} \cdot L \quad \Rightarrow \quad K = \frac{N}{\sqrt{\frac{L}{Q}} \cdot L}$$



SWISS NATS

Resultate der Schweizer-Meisterschaften 1985 im Saalflug F1D

(Gilt als di. 1.Ausscheidung für die WM 1986 !)

HALF MOTORS

1.Teil : Halber Gummistrang (zwei beste von 6 möglichen Flügen)

R.Lotz	38.08	(18.53	14.56	16.16	19.15	o.0)
D.Siebenmann	37.42	(11.29	19.33	18.09)		
Tan Pham	36.51	(15.47	18.30	18.21)		
R.Butty	34.13	(14.57	17.47	16.26)		
P.Keller	34.00	(15.00	18.29	15.31)		
T.Urban	14.39	(14.39)				
W.Heisse	9.32	(0.37	3.42	4.16	5.16)	
R.Ruppert	6.42	(3.17	3.05	3.25)		

2.Teil : Voller Gummistrang

FULL MOTORS

THE BEST OF 3 FLIGHTS

D.Siebenmann	32.23	(32.23	16.02)	
R.Lotz	29.14	(29.14	1.29)	
P.Keller	26.44	(0.00	26.44	17.47)
R.Butty	26.36	(26.36	1.04	22.11)
T.Urban	25.16	(25.16	23.45)	
W.Heisse	24.45	(23.08	24.45)	
R.Ruppert	14.52	(14.52	7.08	12.09)
Tan Pham	0.00			

Schlusswertung :

1.	D.Siebenmann	70.05
2.	R.Lotz	67.22
3.	R.Butty	60.49
4.	P.Keller	60.44
5.	T.Urban	39.55
6.	Tan Pham	36.51
7.	W.Heisse	34.47
8.	R.Ruppert	21.34

Free flight items in Schwitzerland...

Werner Heise is producing some items for free flight and indoor. He also is selling 3mm Pirelli rubber!
His address:
Guggimoos 437
CH-5425 Schneisingen
Switzerland

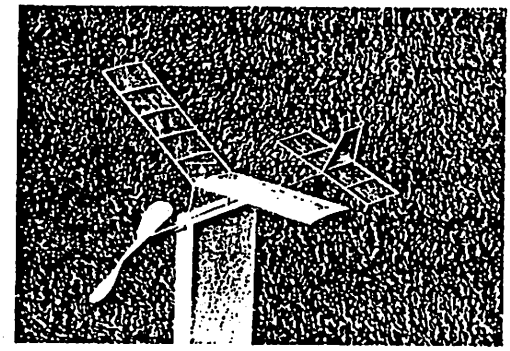
A F1D-BEGINNER CONTEST, ZURICH 15/9-85

RESULTATE

NAME	Flug 1.	Flug 2.	Flug 3.	Flug 4.	Flug 5.	Flug 6.	TOTAL (2beste)	RANG
R.Ruppert	5:24	8:07	6:18	9:02	5:02	6:05	17:09	1.
H.Franke	8:57	6:44	7:39	7:15	5:42	5:58	16:36	2.
D.Beck	5:50	4:14	4:23	4:35	9:33	5:34	15:23	3.
E.Mollenkopf	4:34	5:35	6:30	6:06	-	-	12:36	4.
P. Spörri	5:35	5:53	4:53	4:50	5:02	4:58	11:28	5.
S.Urban	4:08	5:08	4:25	4:41	5:02	4:58	10:10	6.
U.Schück	2:50	3:17	-	-	-	-	6:07	7.
A.Schück	-	-	-	-	-	-	0:00	8.

(4)

STUBENSCHLEICHER



An einem Regensonntag (solche gibt es genug)basteln und gleich in der Stube das Flugerlebnis geniessen!

Das gibt es nur mit dem "STUBENSCHLEICHER". er dreht 6 und mehr Runden. Im Lichthof der Uni-Zürich anlässlich der Schweizermeisterschaft, flogen solche Modelle bis zur 25 Meter hohen Decke. Alle Zuschauer waren begeistert. Viele fragten nach einem Baukasten.

Jetzt ist er da!Für sehr wenig Geld können Sie Ihre Geschicklichkeits-Grenze prüfen.Dieses Anfängermodell der Saalfliegerei kann ab ca.14 Jahren mit etwas handwerklicher Erfahrung gebaut werden.

Im einfachen Baukasten ist sämtliches Material und eine genaue Baubeschreibung enthalten.Sie brauchen kein Messer da alles ausgeschnitten ist.Eine Pinzette für den Zusammenbau empfiehlt sich.

Viel Spass beim Bauen und Fliegen!

Baukasten kompl. Fr. 12.-

Einfachste Bestellungsart: Betrag auf Postchekkonto
50-26197 Aarau
Werner Heise
Guggimoos 437
CH-5425 Schneisingen
SWITZERLAND

Contributions to this issue: in untidy order!:
Mike Stoy, Leopold Walek, Manny Radoff, Ray Harlan, Bernard Hunt, Bob Randolph, Werner Heise, Alfred Klinck, Dr John Martin, Mark Forster, Lu Xiu Seng, Jerzy Kaczorek, Helmut Jakob, Boyd Felstead

I enclose a drawing of my current F1D design which gives a fair amount of detail. I have to say that this a very extreme design and although I've got it going pretty well now and its very competitive, I would be reluctant to recommend it to anyone unless they are prepared to put a lot of effort to cope with the problems- its big, difficult to build down to reasonable weight, its fragile and hard to trim. None else over here has managed to get a good tandem F1D flying although there are now plenty of very good tandem EZBs.

On to your questions and my answers!

(1) I use 22" sticks as you observe but use 4 strips of 0.004 boron although 3 strips at 8,12 & 4 o'clock are really quite enough.

(2) I use the rear wing post as a bracing post to get a big enough angle for the long stick but the wire runs under the wing not over (like Erv). The detachable bracing is a real pain but I can't see any other way of doing it with my design.

(3) I roll sticks on a 0.22" dia rod (blank is 0.75" wide) and the sticks are a bit marginal (torque from my massive motors cause loss of tail tilt) but I did not find wrapping with kevlar or tungsten did any good (if I did not glue the kevlar there was no benefit, if I did then the weight penalty was too high). I use 3.8 lb density wood, generally 0.013" but I think I will have to go up in thickness a bit in future. Are you and your fellow flyers really convinced that the kevlar wrapping works? Have you any test results to show the effect (I test sticks for resistance to twist by measuring the angular deflection under torque)?

(4) Ever since I nearly lost my team place (in 1982) due to an invisible failure of a wire front bearing joint, I have stuck with Harlan bearings and have had no trouble since.

(5) Wings. The drawing shows my original wing structure and a more recent variant. The square outline is chosen so that I don't need any jigs and to avoid curves springing with the stiff spar wood. The choice of wing spar wood (size and density) is absolutely vital (I measure the stiffness of spars and the toughness to shock loads). For stiffness you want the biggest section and lightest wood possible but for toughness to say steering loads there is no point using wood lighter than 5lb and that has to be superbe stock or you need 6lb. The unusual LE tip bracing is there to distribute the lifting load evenly over the whole length of the spar- it is not there to support the tip. The original model used conventional built up compression ribs and very solid ones at that but the latest wing uses boron-balsa composite (boron etched to 0.003 preferably) which is lighter and many times stiffer. Building thin balsa-boron composites is bit of an art. Firstly, you must use 3 strips of boron although 4 is better, and I use indoor cement thinned twice with MEK, and coloured to see what you are doing and applied from a syringe. For a rib, I fix a strip along the top edge of a sheet cut to the top profile, then fix a stip on either side of the sheet where the bottom edge of the rib will be and finally cut out the rib from the sheet just outside the bottom boron strip. I always use Andrews type ribs. Spars are done the same way. I only use boron- balsa composites for compression ribs and for local re-inforcing the centre of the tail although I am tempted to use them for inboard wing spars. I find that although they are fantastically stiff and tough, the lack of flexibility cause the structure to fail somewhere else (usually joints).

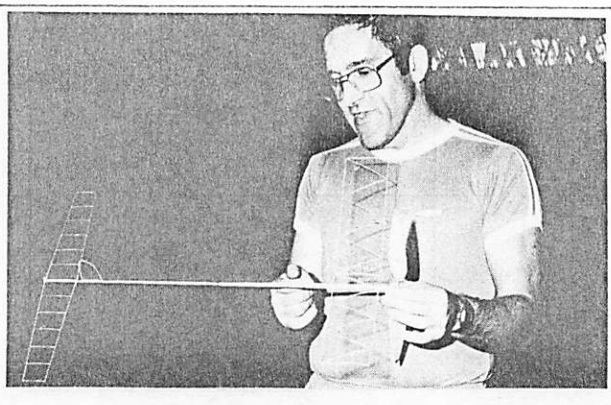
(6) I think the most important reason for long wing posts is to get a good bracing angle for the main wing braces. If you reduce the height of the posts then then the wing twists under the influence of initial torque and stick twist and the aerodynamic load of the extra washin/ washout exaggerates the effect even more. The end result is that characteristic tucked in inside panel of the outside wing (it happened to me at the 1980 W/C at West Baden).

(7) I always set my models up with no downthrust and 2-3 deg sidethrust probably more out of habit than anything else but I don't have any pattern problems on this count.

(8) This will probably surprise you but I have never used VP props at all for EZB or F1D since West Baden. I fly F1Ds only at Cardington and this is too high a ceiling for any advantage for VP props. It would be worth using them on EZBs under low ceilings but VP props are specifically forbidden in our rules (which I wrote so I can't complain!)

(9) My F1D props are very unusual! I use a tiny 18" dia prop and very forward spar position but this is simply because my tandem design won't work with anything bigger. Nobody else uses anything like this in England but I keep on winning and I have a box full of the props so why change. How sure are the West Coast flyers that their huge props give any benefit?

COMMENTS ON "BIG SQUARE" AND F1D... BY BERNARD HUNT.



A BERNARD HUNT PAGE.....

DESIGNER AND "TANDEM TWO" AT CARDINGTON

TANDEM TWO EZB

by Bernard Hunt

I never really believed in "aerodynamics" for indoor models before "Tandem Two". Fancy designs may be OK for Wakefields and the like, but I reckonned success in indoor came from good building and flying. After all most of the top flyers are "seat of the pants" types not great theoreticians!

I'd had adventures with gadgets such as variable pitch propellers, which are great for low ceilings, but not much use at Cardington with its 153 foot height, where I fly most, so I stuck with pretty conventional designs and worked at building light and flying well.

1981/82 saw new rules for EZB in England with a 1.2g (0.042oz) min weight, 14" max prop diameter (no VP), 30 sq. in. max tail area and no restriction on covering material. What a transformation! No longer were EZBs a struggle to build down to a competitive weight and saggy condenser paper was a thing of the past!

Unfortunately for me, my old designs beefed up for the new rules proved uncompetitive so I cast aside my prejudices and set out to build an extreme "aerodynamic" machine.

The "theory" behind "Tandem Two" is an extension of that put forward by Dieter Siebenmann with his "Archaeopterix" F1D (NFFS Sympo Report 1979), which says that if you use a long tail moment and a rearward CG then this loads the tailplane and gives a useful contribution to lift and increases performance. My idea was to use a big efficient (high AR) tailplane and a very big tail moment (7 wing chords), i.e. a tandem wing model, to get the maximum benefit.

The results were, to say the least, dramatic with a clear 20% improvement in performance over my previous conventional (and successful) design despite a 50% increase in weight. My best official times for Cardington are 22:23 and 22:30 (National records) with 24:23 achieved in practice. I have done 13:15 in a 25' ceiling hall in rather poor conditions.

The construction and flying methods I use with this model are very typical of current British practice and owe much to Dave Pymm's efforts in the late 70's. As perhaps they are unfamiliar to US flyers I will explain my technique for setting up and trimming EZBs.

First, careful control of flexibilities, warps and thrustlines are the key to successful trimming of EZBs particularly for high sites where a fast climb with high pitch props is needed. A completely stiff model is no use at all—it is virtually impossible to prevent stalling/crabbing to the right under high power, unless you use a low pitch prop which will cost flight time.

The idea is to set the model up to give a wide circle (30-40') for the cruise/letdown condition (very little fin offset and tail tilt is needed) and a nose-up trim pretty close to the stall. I use flight rpm as the guide for optimum trim. (Unlike F1D ships you can't count prop rpms on EZBs and you have to measure the average flight rpm—about 100).

The climb pattern is set without making any alterations which affect the cruise/letdown. Longitudinal trim is adjusted by altering stick stiffness with respect to vertical bowing—if the model shows any signs of stalling then carve or sand away the underside of the stick evenly over its length until it is right—if the model goes flat then stiffen or replace the stick.

Circle/lateral pattern is controlled by the torsional stiffness of the section of the stick between the wingposts which controls the amount of washin induced by motor torque. It is difficult to have too much induced washin on the inside wingtip at full power but too little causes crabbing to the right.

Circle diameter is also affected by sidethrust and sideways stick bowing. I find that 3 deg. left thrust and a true stick work for me but it is safer to have the stick bow to the left rather than the right. I use .008 wire 'whiskers' to control the bow of the stick. Loss of tail tilt can easily occur at full power but a very stiff tailboom and appropriate tail warps will control this.

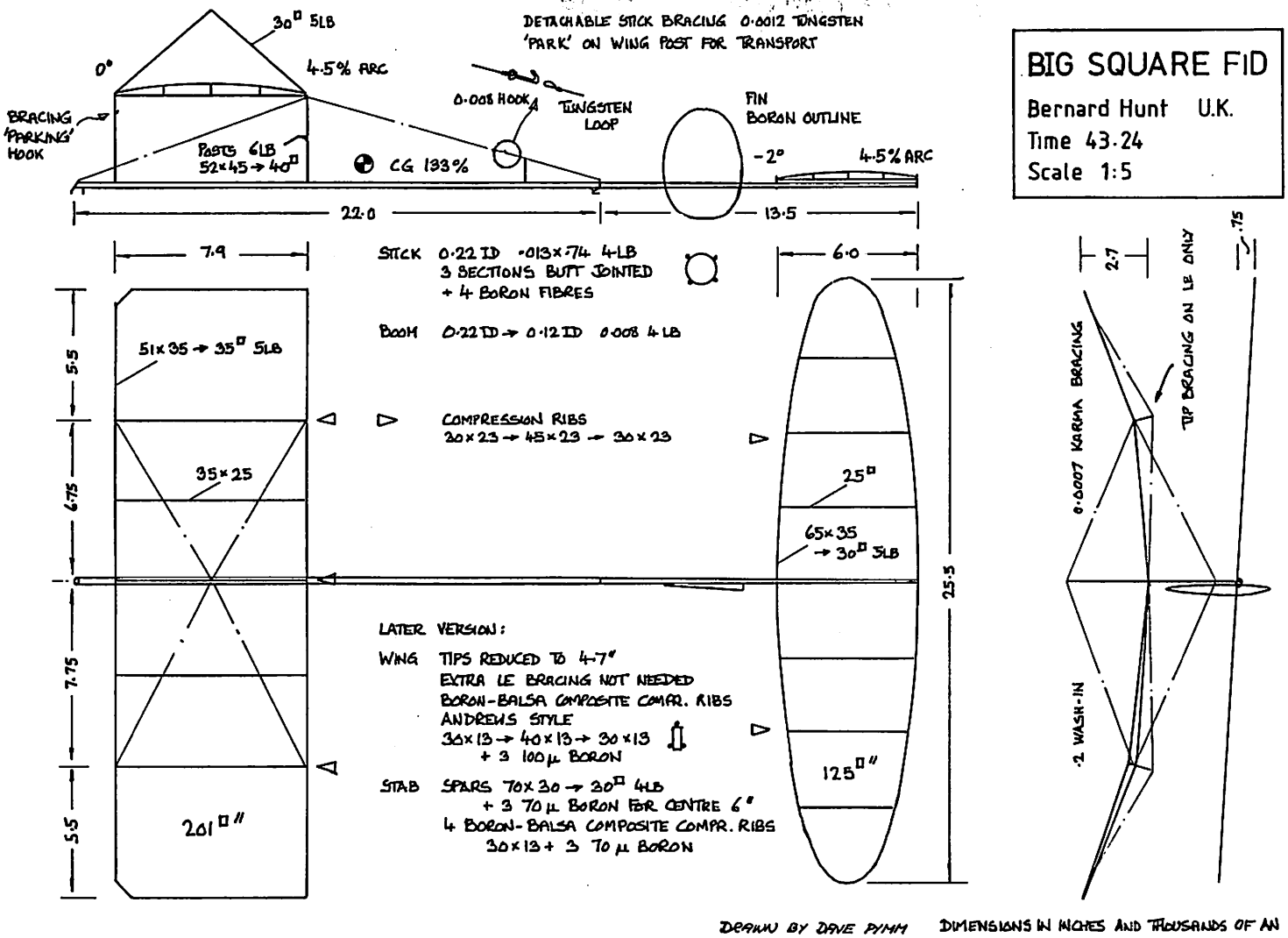
Properly trimmed, "Tandem Two" can be launched with very little back-off and high motor torques to give a very steep fast spiral climb. Despite high nominal prop pitch the model will run off all its turns on quite thin rubber so the best flying method for high sites is to climb "on the burst" and use long thin motors.

Finally, in view of the success of the tandem wing layout for EZBs, it will come as no surprise that I have built an F1D based on the same principles. This model, named "Big Square", turned out to be better than my conventional models and currently holds the British record with 43:23 at Cardington.

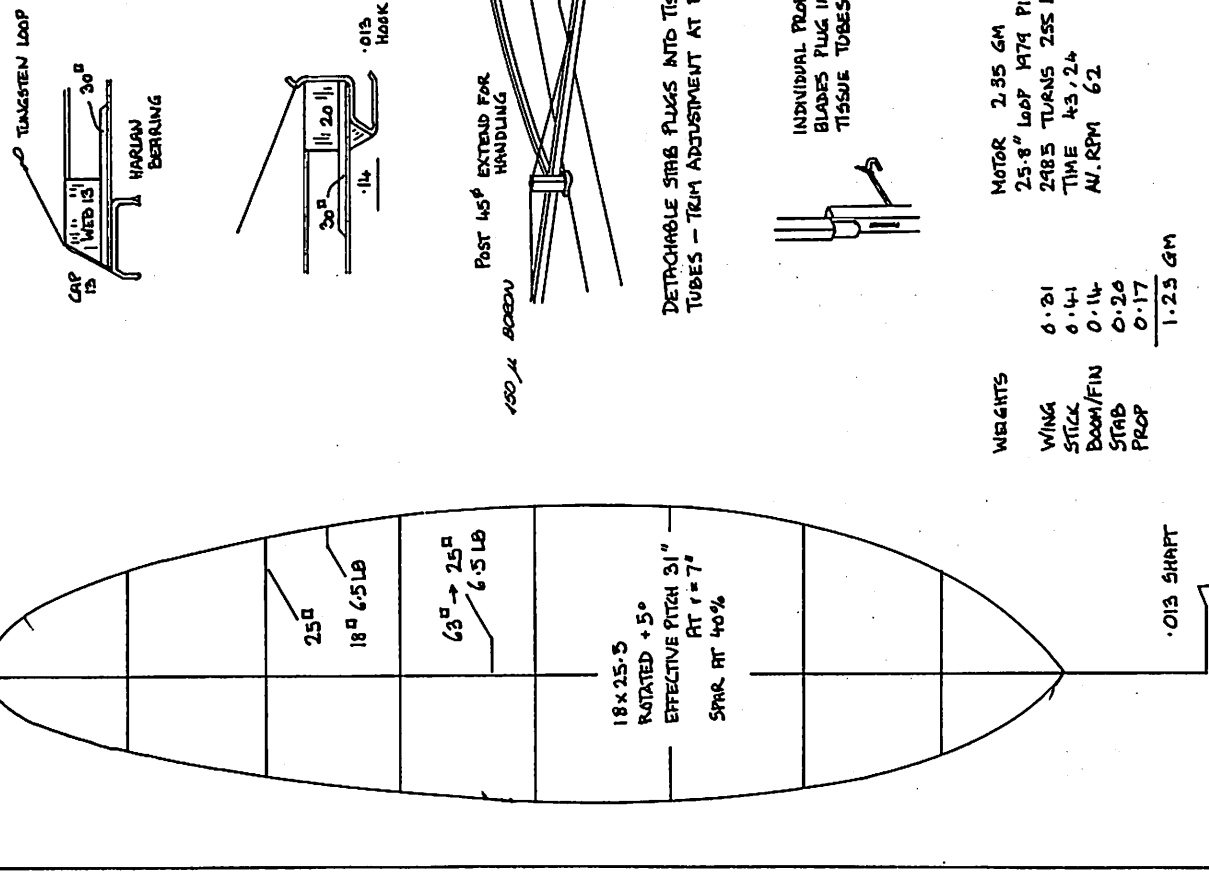
Footnote: Thanks to Dave Pymm for the drawing of "Tandem Two" and John O'Donnell for the photographs.

BIG SQUARE FID

Bernard Hunt U.K.
Time 43·24
Scale 1:5



DRAWN BY DAVE PYNN DIMENSIONS IN INCHES AND THOUSANDS OF AN INCH



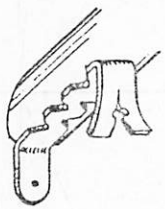
ANOTHER USEFUL WRINKLE....

THRUST BEARINGS

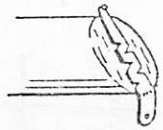
by Manny Radoff

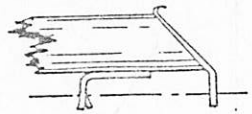
In the days before the 1-gram Indoor FAI model, I tapered thrust bearings in both width and thickness in order to save weight. With every little bit of weight counting, one day I even notched the part glued against the motor stick because that did not need to take bending stress. Little weight was saved, but the greater benefit was the grip gained because the cement came in as a wedge, and there was no slipping of the bearing out of its glue joint.

For a double bearing:



For single bearings:





Lately I have been using tapered motor sticks and a two-piece bearing for two reasons: The first is because I find it difficult to properly align the holes on a one-piece double bearing so that I get the thrust line I want. With a two-piece bearing, I first glue on the rear part, now a pig-tail slot, to the underpart of the stick. Then I glue the front bearing onto the front cap and align it as best I can by eye. Next I insert a wire through the bearing and into the pig-tail and gently move the front bearing to give it the correct alignment, using the wire as a gauge.

The second reason for a two-piece bearing is that I put a small hook on the top of the front piece which serves as an anchor point for motor stick bracing.

An added feature is that the force of the rubber motor pushing against the lower part of thrust bearing is balanced by the pull of the bracing wire.

It would be interesting to recall firsts in Indoor Modeling. For instance, it was Carl Goldberg who first used polyhedral (as I recall at the Nats at Atlantic City, N.J. in 1932.) It was Jerome Kittell who first used microfilm. Now you fellows recall the other firsts and tell me so that I can put them in this column. For instance, who first put the rubber on the bottom of the motor stick? Who made the first built-up propeller? Who used the first lifting tail? Who broke the time barriers: 20, 30, and 40 minutes?

RAY HARLAN ON....

Applying Ultrafilm with Spray Cements

RH-2/24/84

With proper care, spray cements can provide a lighter, more uniform adhesive for Ultrafilm (and other plastics and condenser paper) than any brushed on coating. Brushed-on adhesives are difficult to control and take much longer to apply. A light spray adhesive will add less than .0001 oz. per sq.in., or less than .0002 oz. for an Easy B wing. One of the best features of spray cement is that it allows repositioning of the film if a mistake is made while covering.

The first step is to choose the right product. Many spray cements (such as 3-M's Spray-ment) produce a cream-colored lacy pattern that is too heavy and is not uniform . Much more suitable are 3M Super 77 or 75, and Grumbacher 548 with fine, transparent sprays. The Super 77 is a high-tack adhesive that now comes with an extra fan-spray nozzle ideal for indoor models. For the lightest covering, Number 75 is best. It has a lower, but more than adequate tack, and is formulated for temporary bonds. The air loads on indoor models are so low that this adhesive is essentially permanent. Grumbacher 548 sprays uniformly, has moderate tack, but is heavier than No. 75. It has an orange tint that makes it easier to see.

When setting up to cover a model, two essential items must not be overlooked. First, be sure the room is well ventilated. This means open windows and fresh air. Second, cover the floor where you will spray with lots of newspapers, at least three feet beyond each edge of the largest frame you will spray. You don't want gummy furniture. Spraying in a large, open-top box will help contain the overspray.

To help see where you are spraying, try this: shine a flashlight horizontally across the room a few inches above the floor. Turn out all other lights when you spray. The aerosol droplets will reflect light from the flashlight so you can see them more easily. This is a good way to estimate how much cement you are applying, and where. A black plastic background also helps you see the droplets and can be cleaned with paint thinner.

Use just one pass on a narrow wing, and no more than two on a wider wing (one each for the leading and trailing edges). For No. 75 and 548, hold the can 12 to 24 inches above the frame. For No. 77, use 24 to 36 inches. Spray at about one foot per second. You will be surprised how little adhesive is required. Remember, less is lighter.

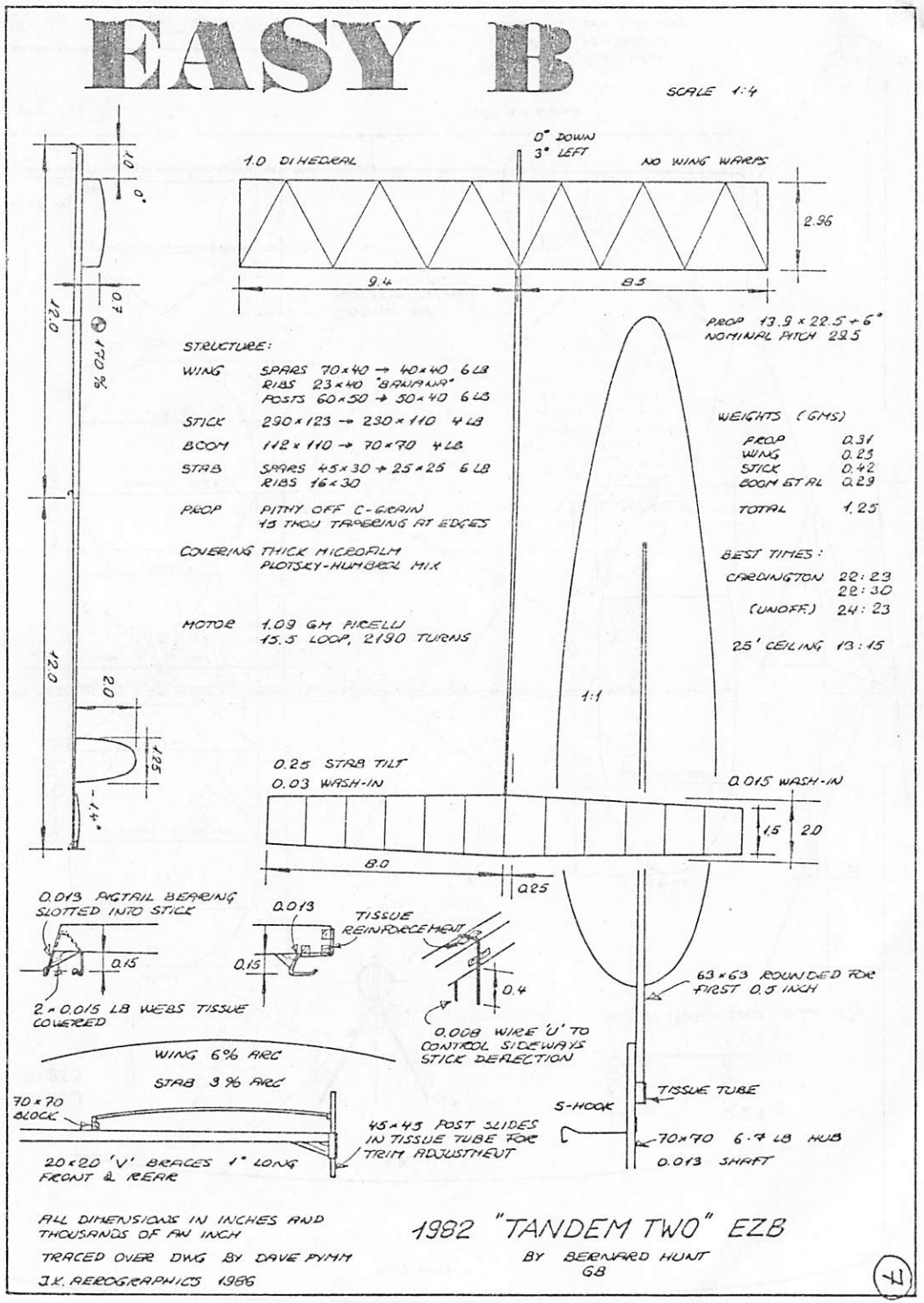
The best covering method is to borrow a microfilm technique: cover the wing flat and add dihedral later. If the sprayed frame is put over a traced outline on the board, it can be adjusted to eliminate skew and wiggly outlines. You may need to tack glue it to the board if it doesn't want to stay in place. There is no rush: the spray adhesive will stay tacky enough for several hours.

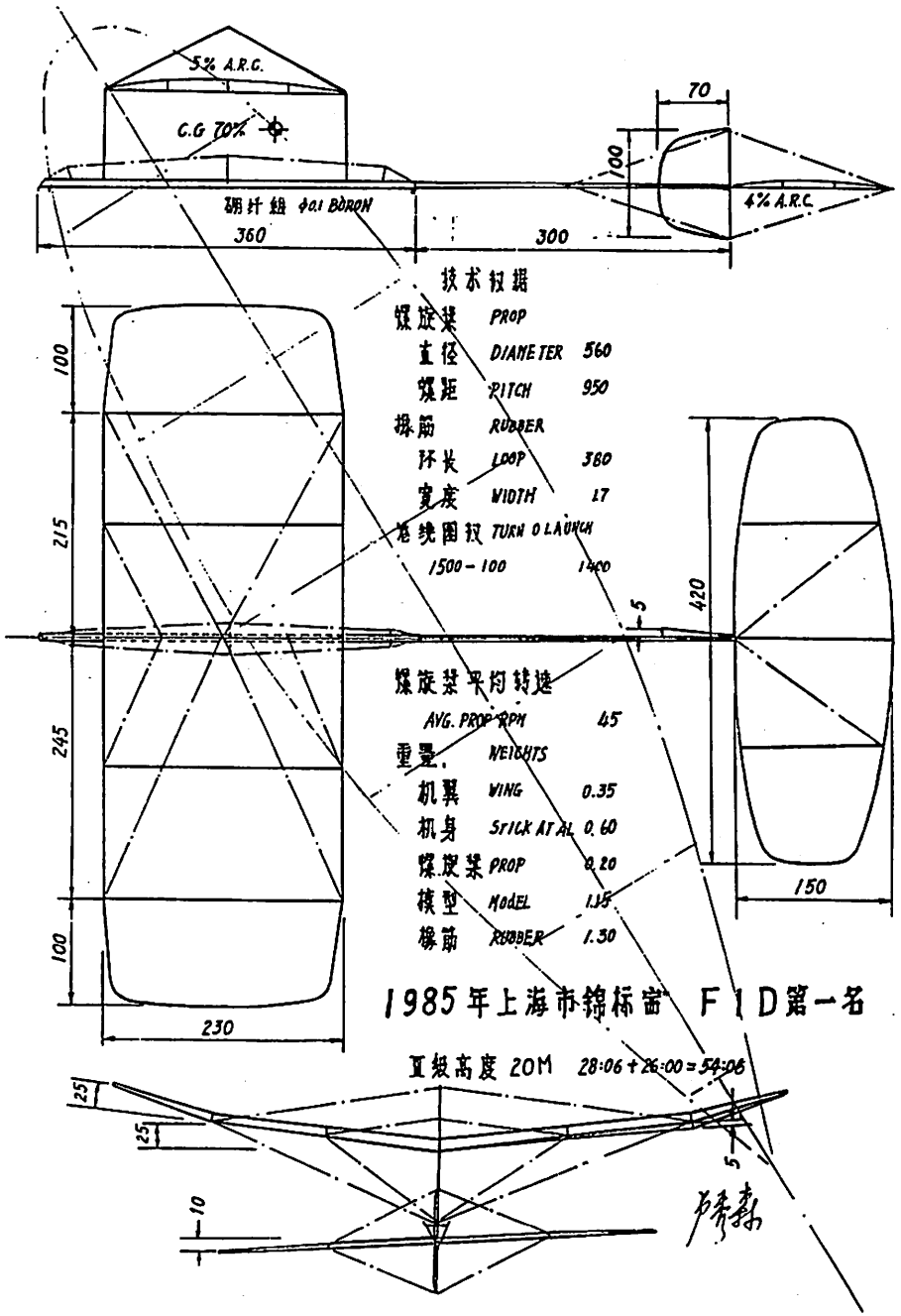
Ultrafilm can be applied either from a light balsa hoop larger than the frame to be covered, or two people can hold it with a hand at each corner. A little practice will get smooth coverings without crushing curved ribs. If you make a mistake, carefully peel back the covering and rework it. Lightly press on the outline to secure the Ultrafilm. Then cut it out with a pencil soldering iron (a 23 to 47 watt iron with a thin chisel tip is good). Not only is this much easier than trying to use a razor blade, it seals the film edge and prevents rips that might propagate readily. After cutting off the excess film, turn the frame over and press the ribs to secure the film to them.

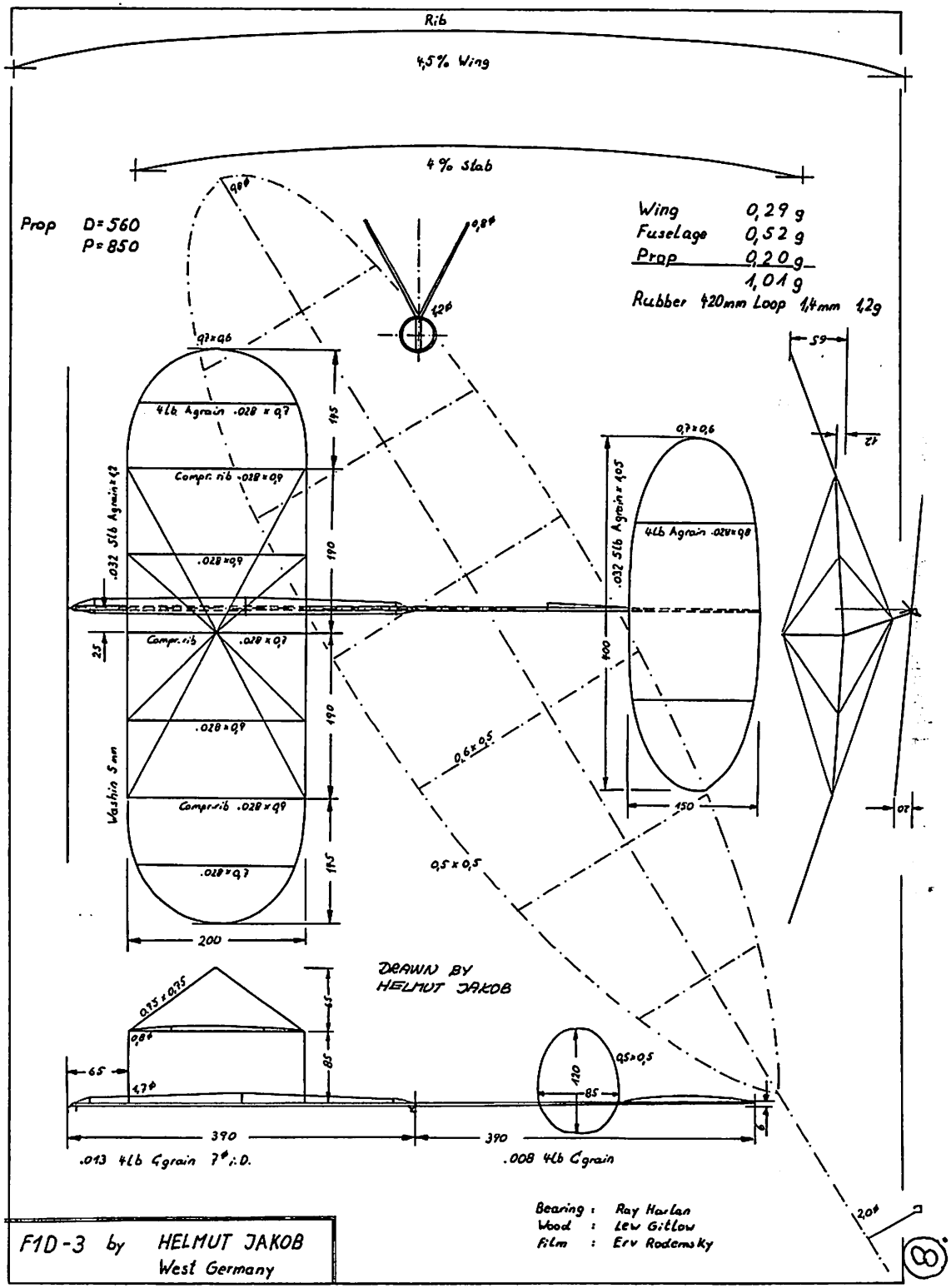
Dihedral in wings can be added at this stage. The film near dihedral ribs will loosen. To draw it tighter, wet a small brush in spray cement (from a spot sprayed on paper) and lightly coat the film on top of the rib. You may want to thin the cement with some toluene (Elmer's contact cement solvent) to make it brush easier. When the coat gets tacky, gently nudge the loose film against it with a thin flat (but dull) tool, or balsa sliver, from below the wing. Be careful not to push too much film onto the cement strip or the dihedral rib will bow excessively. If this happens, pull the film apart and rework it. This technique requires some practice. But remember, loose film is not too detrimental to long flights.

These covering suggestions should get you well on your way to indoor modelling without the frustrations encountered with paper and other plastic covering materials. Soon you will be devising your own special techniques to further simplify the job.

When you buy ULTRAFILM from Ray Harlan you will find this instruction enclosed - many useful tips. Ray sells the ultrafilm at 10 feet/6,- dollars and lives at: 15 Happy Hollow Road, Wayland, MA 01778, USA.




5% A.R.C.
C.G 70%
70
100
4% A.R.C.
碳针组 4ct BORON
360
300
技术数据
螺旋桨 PROP
直径 DIAMETER 560
螺距 PITCH 950
橡筋 RUBBER
环长 LOOP 380
宽度 WIDTH 17
起线圈数 TURN O LAUNCH
1500 - 100 1400
螺旋桨平均转速
AVG. PROP RPM 45
重量 WEIGHTS
机翼 WING 0.35
机身 STICK AT AL 0.60
螺旋桨 PROP 0.20
模型 MODEL 1.15
橡筋 RUBBER 1.30
100
215
245
100
230
420
150
5
1985年上海市锦标赛 F1D第一名
直级高度 20M 28:06 + 26:00 = 54:06
25
25
10
5
FROM SHANGHAI INDOOR SCENE..!


Rib
4,5% Wing
4% Stab
Prop D=560
P=850
Wing 0,29 g
Fuselage 0,52 g
Prop 0,20 g
1,01 g
Rubber 420mm Loop 1,4mm 1,2g
4Lb Agrain .028 x 0,7
Compr. rib .028 x 0,9
.028 x 0,9
Compr. rib
.028 x 0,7
.028 x 0,9
Compr. rib .028 x 0,9
.028 x 0,7
.032 5Lb Agrain x 4,5
Washin 5 mm
115
190
190
115
25
200
0,7 x 0,6
.032 5Lb Agrain x 4,05
4Lb Agrain .028 x 0,8
400
150
0,6 x 0,5
0,5 x 0,5
0,5 x 0,5
59
12
07
DRAWN BY
HELMUT JAKOB
0,75 x 0,75
45
85
65
120
85
390
390
.013 4Lb Cgrain 7" i.D.
.008 4Lb Cgrain
Bearing : Ray Harlan
Wood : Lew Gillow
Film : Erv Rodemsky
F1D-3 by HELMUT JAKOB
West Germany
8

CHINESE INDOOR FLYING 1985/86

10月13日上午进行了小学生PID-1普及室内模型比赛，共有36名小运动参加比赛，下午进行了中学生PID-2普及室内模型比赛，共有50名运动员参加比赛。

由于加大了模型的飞行重量，故而飞行成绩比84年略有下降。但在制作上却可不一定要使用轻木，用一般的桐木、芦苇杆、麦杆均可制作这给普及推广室内模型带来一定好处。

Thirty six primary school modeller participated PID-1 & 2 (Chinese Nats) competition at Nov. 13rd. Model weight is limited at 3gr. & 5gr (New rules increased the weight) so flying scores were decreased than 1984. But Technique and crafts level were much better than 1984. Lot of competitor use Chinese local wood (Tong wood) it weight twice as balsa, and much stronger.

PID-1 前三名成绩

	1	2	3	4	5	6	总分	名次
陈 翔	4'04"	4'27"	5'56"				14'27"	1
孙玉华	4'55"	3'24"	5'19"				13'38"	2
宗韵芸	3'51"	4'46"	4'33"				13'04"	3

PID-2 前三名成绩

	1	2	3	4	5	6	总分	名次
唐 征	5'56"	6'48"	7'15"				19'59"	1
骆永强	6'15"	6'09"	6'33"				19'17"	2
沈 俊	6'02"	7'05"	5'06"				18'13"	3

FROM LU XIU SENG JAN 1986

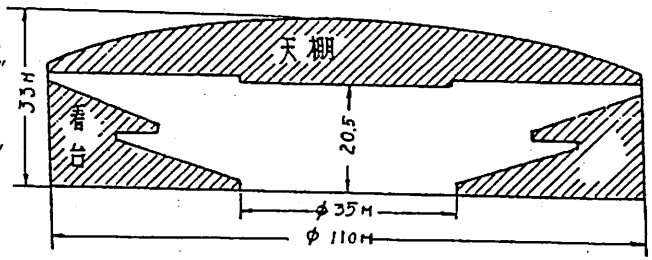
1985年上海市室内模型简讯

1985年上海市航空模型锦标赛FID比赛于1985年10月在上海市体育馆举行。该馆顶高20.5M屋面最高度(见示意图)。10月6日至10月9日进行试飞，10月11日、12日举行了比赛。

比赛及试飞期间天气较好，室外温度略高于室内温度，故而气流比较平静。但由于上海体育馆为安全起见不准使用氢气球进行转向技术。故而有几次较好的飞行由于气流的偏移，降落在看台上而影响了成绩。

通过比赛可看出飞行水平比84年有较大提高。84年为23'48" + 23'02" = 46'50" 85年为26'07" + 26'00" = 54'07" 约提高了5分左右。

本次比赛共有8名运动员参加。



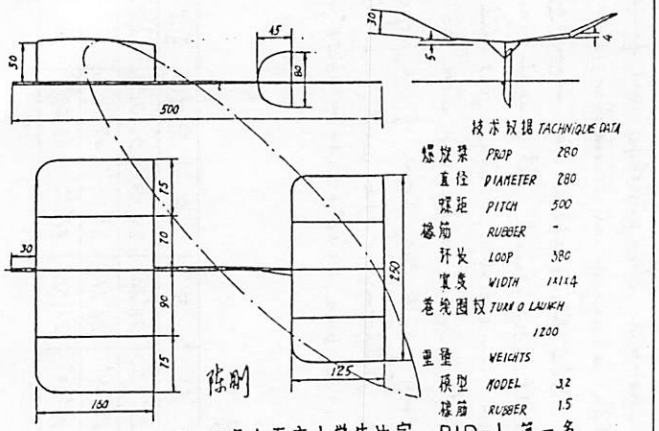
上海体育馆示意图

SHANGHAI INDOOR MODEL NEWS

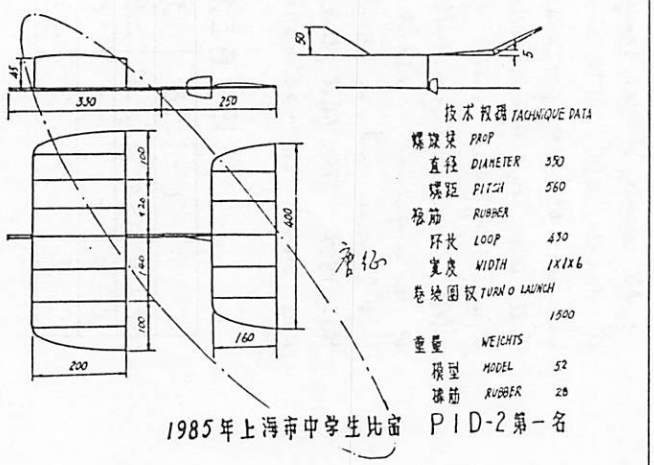
All events of 1985 Shanghai aeromodel champineships was finished at November 31th. FID competition arrenged at November 11ST-12nd and at 6th-9th for pratice. The flying space was Shanghai Sport's hall with 20.5 meters ceiling hight (3rd class) At competition time it was very fine, inside flew was more stable. Organizers did not allow to use Hydrogen ballon and Helium is too expensive so all of the competitors couldn't steering. and then some of the propeful model were rest at spectators platform. The result was better than 1984. The first place at 1984 was 23'48"+23'02"=46'50", at 1985 was 28'07"+26'=54'09".

FID 前三名成绩

	1	2	3	4	5	6	总分	名次
卢秀森	28'07"	6'34"	26'00"	21'33"	24'24"	25'58"	54'07"	1
堪 铭	C	C	0	22'49"	24'16"	21'52"	47'05"	2
张 荣	17'49"	16'53"	20'57"	18'18"	21'52"	17'52"	43'07"	3



1985年上海市小学生比赛 PID-1 第一名



1985年上海市中学生比赛 PID-2第一名

FROM SHANGHAI INDOOR SCENE..!

MODELS and MUSINGS

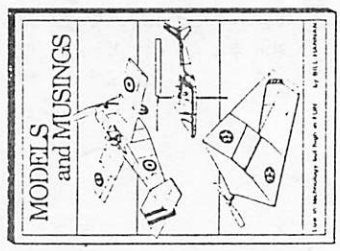
NEW

NEW! MODELS AND MUSINGS, a book of "low-tech" fun flyers by Bill Hannan.

Featured are selected articles published from 1966 through 1984 in such magazines as American Modeler, American Aircraft Modeler, Junior American Modeler, Model Aviation, Model Builder, Sig Aircraft Modeler, Flying Models and Model Airplane News. Presented are FULL-SIZE model construction plans for 14 rubber-powered projects, including two basic biplanes, 2 profile helicopters, the Escondido Mosquito, the Stringless Wonder, a facile flying disc, a clever canard, a model-of-a-model, a whimsical Bostonian and 4 uncomplicated gliders. 18 (count 'em) eighteen non-scale plans in all, JUST FOR YOUR FUN! Bonus attractions are contributions from other talented designers, cartoonists and photographers, plus Hannan's philosophical tidbits. FORMAT: 8½" x 11" size, 80 lb. stock, 56 pages, 55 photos and more than 30 drawings. 3-color card cover. ISBN 0-961652-2-7 PRICE: $8.95

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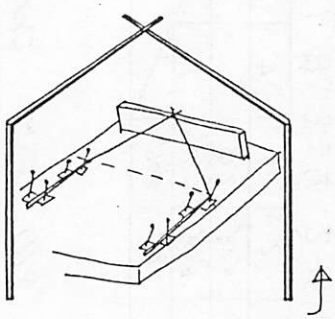
Country _____ Zip or Post Code

SIMPLE IS SATISFYING!

INDOOR WING-POST BIPOD
by Manny Radoff

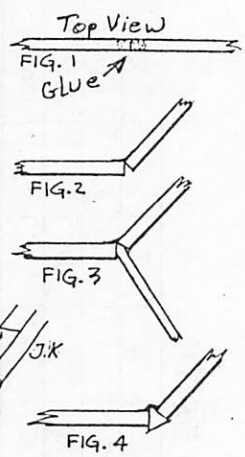
Wing strut and bi-pod should be built in one piece. Spread the bottom and slip onto wing or slip over narrow end of tapered wing. Glue to front and rear faces of wing spars.

It is not necessary to place this assembly at a rib position. If you are in doubt and believe the base of the bi-pod will spread, glue some bracing wire across the bottom of the wing at this assembly.

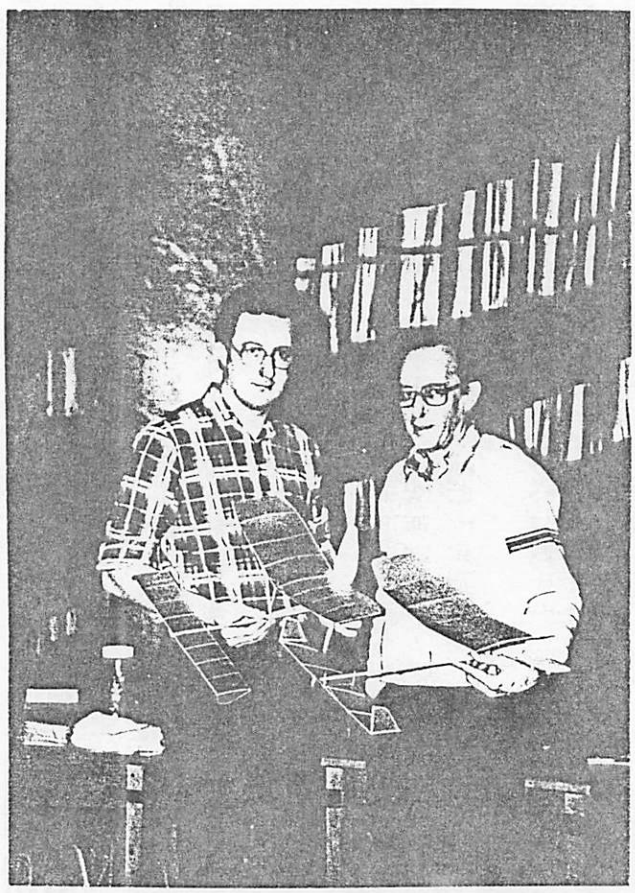


I no longer make my wing spars -- center and tip sections -- in one piece since my friend, Ernie Kopeck, told me of his idea. One piece construction needs to be cut and bent to get dihedral. A slip of the blade and you've got a floating joint with turn microfilm, or bad handling and fingers will put holes in the film when applied pressure is used to break the wood fibres to bend in the dihedral. With Ernie's method, you butt joint the tip to the wing spar and put glue on the top as in Figure 1. It will hold together well. After the wing is covered the joint will bend at the glue joint, with the glue acting like a hinge, as shown in Figure 2. Erv Rodemsky uses his wing tip bracing post as a joint filler to prevent the glue from warping his wing tips, as shown in Figure 3. I fly with unbraced tips and use a small triangle of wood glued on the face of the spar to prevent warping, shown in Figure 4. These triangles also serve as a place to hang the wire when bracing.

DIHEDRAL JOINTS



MANNY'S WRINKLES - A GOLDEN SOURCE....



WAC'LAW & LEOPOLD WALEK WITH PENNY-PLANES

THE HANGAR PILOT

EDITOR: DR JOHN MARTIN, JR
2180 TIGERTAIL AVE MIAMI FLA. 33133

..... is published 8 (or 9) times a season for a bunch of middle aged guys who refuse to grow up (or give up). MIAMA (Miami Indoor Aircraft Model.Assoc.) AMA Club 986 is the only active indoor free flight club in AMA. OUR MOTTOS: "It must be fun." and "Indoor isn't for everyone." For a paltry 10,- US dollars a season you will receive all copies, and be a member of MIAMA.

(13)

EVERYONE INVITED ° R.S.V.P.

So you think the Olympics was big? Wait till we fly the 3rd World Pistachio Proxy Inter-Gnats...April 13 & 14, 1986

Pistachio Scale models are like peanuts, only smaller. They are a bit harder to build and trim. You have to use tweezers sometimes. The tiny bit of rubber power is hard to get. Try a golf ball, or the inside of shock cord (bungee) if you can't cut down on your rubber. .030" to .050 size and 3 inch propellers or a bit bigger.

There are many plusses: Cheap to build, cheap to mail, durable in the slam-bang world of postal services, small enough to trim in your own home, little time expended, lots of fun.

We will provide trophies, and publish a list of all who enter so we can see where our flying friends come from, and their addresses. Also you will be informed of the complete meet results, even if you are last. We realise that there are a limited number of people who are interested in this sort of thing, but at least we will all get to know each other. PISTACHIOS FOREVER! ERIC SEEFER PISTACHIOS.

There is a great tentation to build unusual aircraft - canards, triplanes, autogyros, etc. What can you lose? A few evenings work. 3-views, and maybe a photo are the only documentation needed.

WE ARE SENDING THIS ISSUE OF HANGAR PILOT TO ALL THE KNOWN MODEL AIRPLANE PUBLICATIONS IN THE WORLD, plus many club newsletters. We hope that this will truly be an international event. PLEASE COPY THIS INVITATION if you are a n ewsletter editor. If you know of some obscure publication that has not gotten the word, PLEASE SEND US THE ADDRESS. Bill Hannan has given us a list, but it is not complete...HELP,please.

For any more information write to HANGAR PILOT. Hopefully, got building and testing. CLASS I - UNDER 2 GM. CLASS II 2-3 GM. CLASS III OVER 3GM. RIDOTTO: SMALLEST MODEL TO FLY 30 SEC.

INTER-GNATS ENTRY

NAME _____
ADDRESS _____
NAME OF PLANE: _____ CLASS: _____
WEIGHT (Grams) _____ SOURCE OF PLAN _____
SOURCE OF DOCUMENTATION: _____
PROP SIZE: X _____ X _____
TYPE PROP: Carved block, laminated, bent wood, plastic, other
POWER: _____ INCH LOOP OF (SIZE) Rubber Company
BEST FLIGHT: _____ SECONDS ON _____ TURNS OF RUBBER

ENTER WORLD PROXY PISTACHIO
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MIAMI, FLORIDA, USA

UNIQUE

Edward Ciapala has some torque-meters, torque-meters to measure torque on the propeller prior to launching and some indoor propeller pitch-gauges. Prices: ?

His address is: ul. Wisniowa 2/15, PL-32-540 Trzebinia, Poland.

Alfred Klinck of West Germany is working on a standard set of rules for the F 1 D Beginner class in order to make it easier to fly these models everywhere in Europe - and in the World. His proposals are as follows:

Max span 460 mm
Min. weight 3,0 grams
Max. rubber weight 1,5 grams
Covering: Everything except microfilm
Stick and boom and propeller from solid wood, wood bracing is allowed, but not the use of metal or composites.
Only hooks, shafts and bearings may be of metal or composites.

Alfred is very eager to get your opinions and proposals. Please write him at Kurt-Schumacher-Allee 235, D-663 Saarlouis, W. Germany. The editor is also interested in this issue.

Alfred Klinck sometimes has problems with lifting his filmsheets without breaking them - due to hard water and high pressure weather, he says. But a small trick has helped him. When the film is ready for lifting his son puts a 5 mm tubing under the long edge of the film into the water and blows gently. The air bobbles in the water then loosen the film from the water, and father Alfred lifts the frame step by step while the son is blowing until the whole sheet is out of the water.
Even the thinnest filmsheets can be lifted in this way .....

FILM TRICK 5!

Australian news:

On October 5th the Victorians held their Champs in a hall 11,4 m high. Richard Blackam did some very good flights coming close to the World Record of Jim Richmon (cat II, FAI) with JABIRU model and VP prop.

Results:

F1D

1. Richard Blackam	33:05 + 33:12 = 66:17		(four flights over 30 min!!)
2. Mark Forster	18:30 + 18:09 = 36:39		(first ever F1D flights)
3. Sean O'Connor	6:24 + 7:07 = 13:55		

Ornithopter

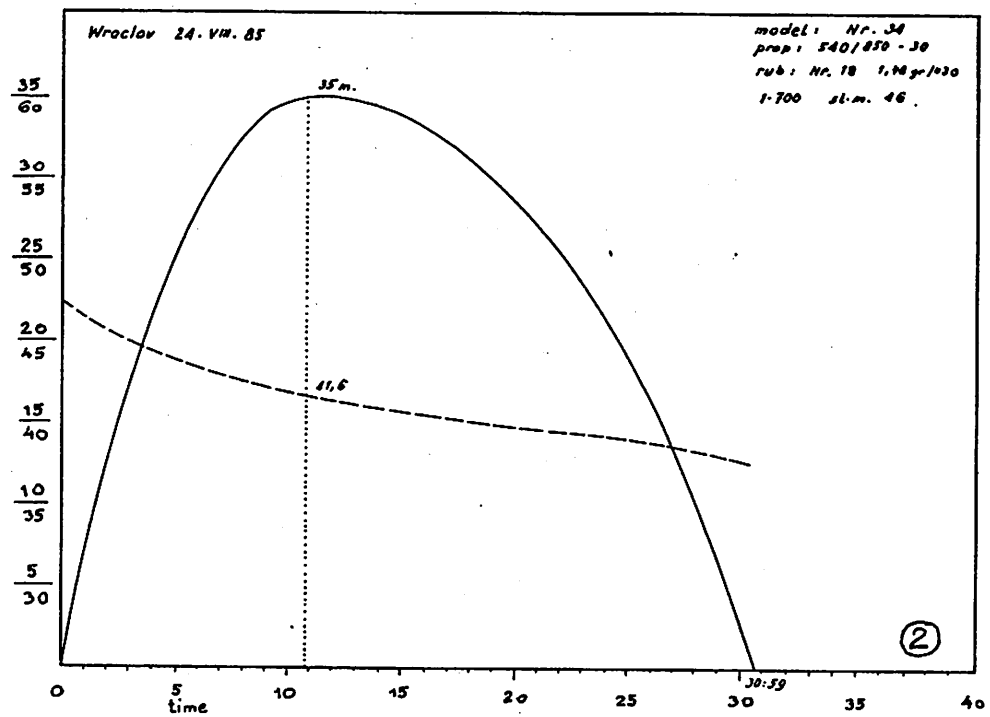
1. Philip Watson	7:35 + 6:40 = 14:15	
2. Sean O'Connor	2:15 + 2:23 = 4:38	
3. Richard Blackam	:05	:05

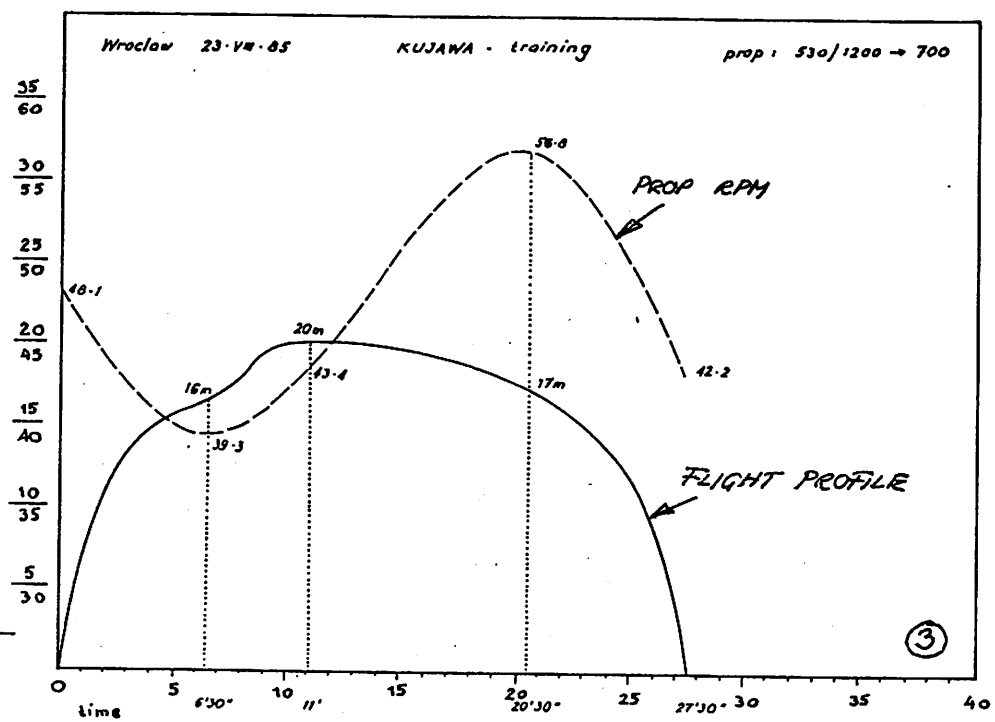
Thanks to Mark Forster - a newcomer - for these results

INDOOR NEWS AND VIEWS (INAV)

Subscription rate overseas: surface 6,50 US dollar
air 7,25 " "

for 10 issues. Address: Richard & Melody Doig, 6 Canary Hill Dr., Pontiac, MI 48055, USA





A letter from Leopold Walek .....

..... And now I would like to contribute to the interesting questions in latest "Indoor News":

Adjusting model to the hall and weather

We do different models to different halls, mainly we adjust CG: to "Z" hall (turbulent hall) at 60%, to Wroclaw, Hala Ludowa at 70% (calmer hall). At Cardington we would have the CG at 75%. Also a larger stab would be used.

Our models in Slanic are different: They are smaller, but stouter to hold out the winding of the strong rubber and steep climb after start. Drawing of the prop bearing assembly, FIG. 1.

Winding techniques

Force and lack of scruple, a large supply of good rubber and you will get the right results!

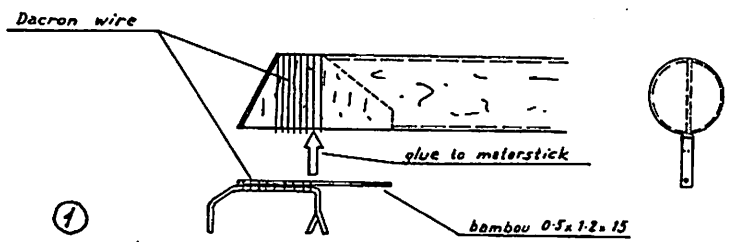
Pre-contest testing and preparing of motors

We prepare our motors in this way:

- finding of "K"
- finding of performance deformation
- separating rubber according to weight of 1 meter
- preparing motors by straining (stretching?)
- testing of each motor on torquemeter, plotting moment-curve and calculation of "work" of the motor (energy??)

To test the propeller and the model we use the graphic method - we ascertain flying path and prop RPM. FIG. 2 shows a flight profile from Wroclaw 1985. Also a testing flight of S. Kujawa - variable pitch prop - is shown on FIG. 3.

We obtain very valuable study material by doing these tests.



CONTESTS 1986

Contest Calendar: 1986

	Contact Alfred Klinck.	
19-20 April,	Team-Cup, Dillingen, W. Germany Site is 7 meters high.	35 cm Paper and plastic, F1D Beginner + F1D.
10-11th May,	Open International Indoor, F1D and all categories. Contact R.A.A.C./M. Huybrechts, Karel de Pretorlei 112, MK B-2200 Borgerhout, Belgium. (Antwerpen)	
June ?	International Indoor Contest, Hala Ludowa, Wroclaw, Poland. Contact Jerzy Kaczorek, ul. Solskiego 13a/2, PL-52-401 Wroclaw, Poland - or the Editor.	
23rd -25th August	Cardington - WORLD CHAMPIONSHIPS - F 1 D	
Same date as W/C!!	Open International Indoor, F1D and All categories. Flemalle, Belgium. Contact van Hauvert, Grand Place 1/52 B-4110 Flemalle	

CONTESTS 1986

Flemalle/Belgien 1985

9e concours international pour modèles réduits d'avions de vol d'intérieur



23, 24 et 25 août 1985

EZB

1.	J. Desmet	B	1379 sec.
2.	J. Weil	BRD	1321 sec.
3.	P. Keller	CH	1289 sec.
(13) 4.	D. Beck	BRD	1269 sec.
5.	J. Delcroix	F	1231 sec.

F1D

1.	D.T. Pahm	CH	1790 sec.
2.	E. Liem	NL	1350 sec.
3.	P. Keller	CH	1048 sec.

F1D Beginner

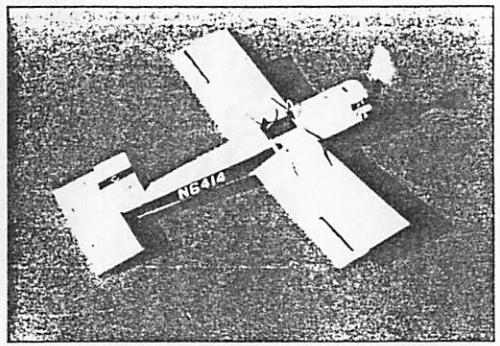
1.	D. Beck	BRD	967 sec.
2.	P. Keller	CH	965 sec.
3.	B. Sabel	BRD	947 sec.
(9) 4.	J. Weil	BRD	919 sec.

SAINTE Klasse

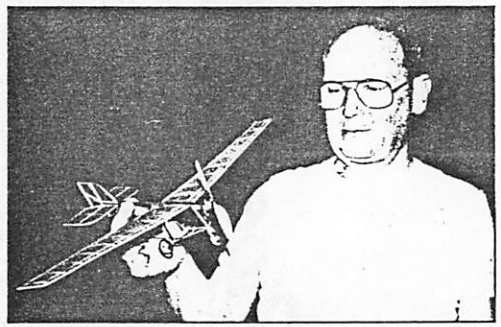
1.	J. Delcroix	F	625 sec.
2.	H. Fraikin	B	618 sec.
3.	L. Koutny	CSSR	601 sec.
4.	E. Fillon	F	556 sec.
5.	S. Glöckner	BRD	491 sec.

Peanut Dauer

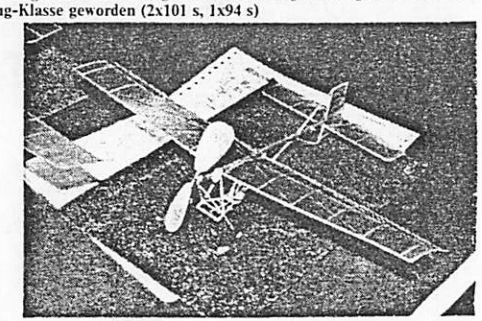
1.	J. Weil	BRD	Cloudbuster	1087 Pkt.
2.	E. Fillon	F	Hurricane	950 Pkt.
3.	S. Glöckner	BRD	Volksplane	939 Pkt.
4.	E. Fillon	F	Prest Baby	923 Pkt.
5.	J. Delcroix	F	Pottier 100 Ts	911 Pkt.
6.	A. Genther	CH	Pottier P 100	900 Pkt.
13.	S. Glöckner	BRD	FRED	809 Pkt.
14.	J. Weil	BRD	Skyrider	807 Pkt.
15.	S. Glöckner	BRD	Wittmann Tailwind	781 Pkt.
23.	B. Sabel	BRD	Kapferer Astra	639 Pkt.

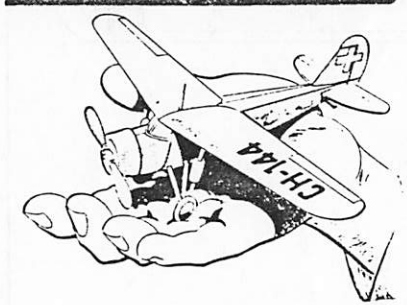


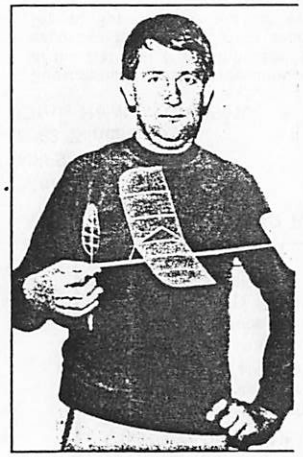
Flüge von fast 1 ½ Minuten Dauer brachten S. Glöckner einen guten dritten Platz. Modell Volksplane.



Ultralight als Peanut: Jürgen Weil ist überlegener Sieger in der Dauerflug-Klasse geworden (2x101 s, 1x94 s)







Saalflugrekorde

Bernd-O. Miehe, 38-jähriger Diplomingenieur aus Gifhorn, hat am 2. September 1985 in der Halle des Sportzentrums Süd seiner Heimatstadt zwei deutsche Rekorde für Saalflugmodelle aufgestellt. Die Halle hat eine Nennhöhe von knapp 8,50 Metern und zählt zur Deckenkategorie 8-15 Meter.

In der Klasse F1D-P1, papierbespannte Saalflugmodelle, flog das Modell 13 Minuten und 27 Sekunden. Der bisherige Rekord stand auf acht Minuten und dreiunddreißig Sekunden.

In der Klasse F1D-M1, filmbespannte Saalflugmodelle, wurde der bestehende Rekord sogar mehr als verdoppelt, von 8 Minuten 25 Sekunden auf 16 Minuten 53 Sekunden.

OGÓLNOPOLSKIE ZAWODY MODELI HALOWYCH MAŁYCH FORM

WROCŁAW * HALA LUDOWA * 1985 NOVEMBER 30

* SZYBOWCE 500 (?HLG) * SENIORZY *

1.	JACEK SIERPOWICZ	MKL OLD BOY WROCŁAW	045"	045"	090"
2.	PAWEŁ PRĄCKIEWICZ	AER. WROCŁAWSKI	045"	040"	085"
3.	KRZYSZTOF GISZTEROWICZ	MKL. OLD BOY WROCŁAW	040"	040"	080"

* JUNIORZY *

1.	DARIUSZ STEŁMALSKI	MKL MDK WROCŁAW	037"	036"	073"

* MŁODZICY *

1.	MIROSŁAW HRYCAK	MKL MDK WROCŁAW	035"	041"	076"

COMPETITORS 13

* F1D-450 (PENNYPLANE) * SENIORZY *

1.	RYSZARD MAJEWSKI	RSM "Jedność" BYDGOSZCZ	07:40	05:50	13:30
2.	SYLWESTER KUJAWA	KML „Astra" POZNAŃ	06:00	07:29	13:29
3.	JAN DÖHM	AER. KRAKOWSKI	06:42	06:24	13:06

* JUNIORZY *

1.	JAROSŁAW SIERKO	RSM "Jedność" BYDGOSZCZ	06:04	06:08	12:12

* MŁODZICY *

1.	DARIUSZ SKOCZYLAS	AER. KRAKOWSKI	05:53	05:37	11:30

COMPETITORS 25

* EZB * SENIORZY *

1.	RYSZARD CZECHOWSKI	AER. KRAKOWSKI	08:48	08:55	17:43
2.	JAN DÖHM	— " — " —	07:48	07:53	15:41
3.	STANISŁAW GARLICKI	— " — " —	06:41	07:53	14:34

* MŁODZICY

1.	DARIUSZ SKOCZYLAS	AER. KRAKOWSKI	05:56	05:29	11:05

COMPETITORS 4

* ORZESZKI – 330 (PEANUT SCALE) * SENIORZY *

1.	SYLWESTER KUJAWA CANARD	KML „Astra" POZNAŃ	074	092	094	260
2.	JERZY MAGNUSZEWSKI WACO-E	— " — " —	063	062	063	188
3.	JAN GŁOWACKI PIPER J-3 „CUB"	— " — " —	067	052	056	175

COMPETITORS 8

ORGANIZER • MODELARSKI KLUB LOTNICZY „OLD BOY" WROCŁAW
• MŁODZIEŻOWY DOM KULTURY IM. M. KOPERNIKA WROCŁAW

Leopold Walek sent the editor the results from the Slanic International Indoor Contest - originally planned as the European Champs, but the Rumanians did not fulfill some FAI requirements, so .... There were fliers from Hungary, Poland, Rumania and Bud Romak, USA! 21 competitors in all.

The results:

1.	Aurel Popa	37:03 + 36:07	= 73:10
2.	Bud Romak	36:00 + 31:41	= 67:41
3.	Aurel Morar	34:03 + 33:35	= 67:38
4.	Cornel Mangalea	32:17 + 34:35	= 66:52
5.	Nicu Bezman	33:56 + 32:37	= 66:33
6.	Edward Ciapala	34:20 + 32:09	= 66:29
7.	Antal Egri	32:27 + 32:15	= 64:42
8.	S. Kujawa	31:37 + 32:51	= 64:28
9.	Vasilie Nicoara	30:38 + 33:36	= 64:14
10.	Andras Ree	30:37 + 31:24	= 62:01

SLANIC INTERNATIONAL 1985

Leopold also tells a little about the F1D situation in the CSSR. He says it is very bad by now. Kalina is flying F1E gliders and buzy with his model firm, and Rybecky and Chlubny are not flying regularly, but Leopold and his son is very keen, unfortunately they do not see any chance of getting to Cardington this time....

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is an AMA-affiliated non-profit organization whose purpose is to preserve, enhance, and promote the sport and hobby of Free Flight Model Aviation in all its forms.

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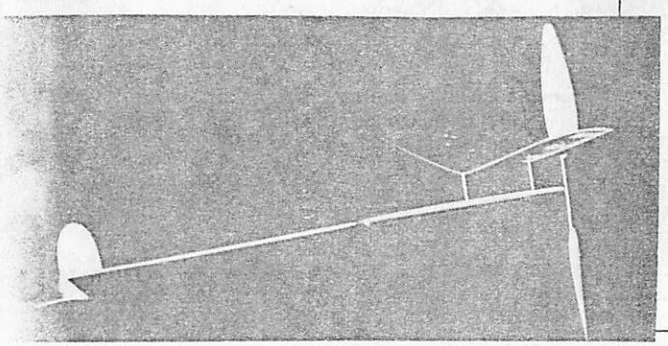
New member ☐ Renewal ☐ Address change ☐

Current expiration date: Mo. ..... Yr. .....

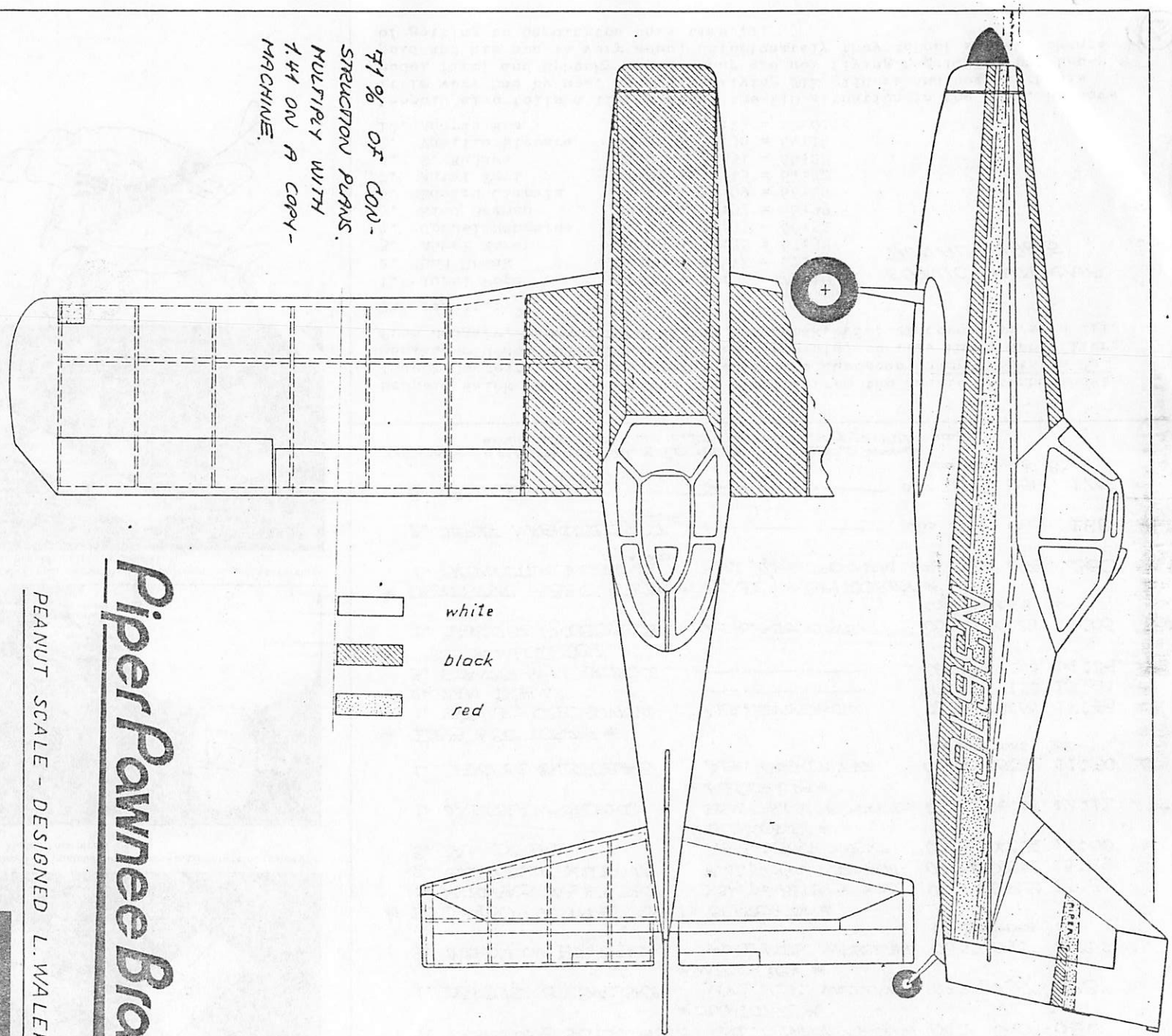
Name AMA #

Address

City, State Zip

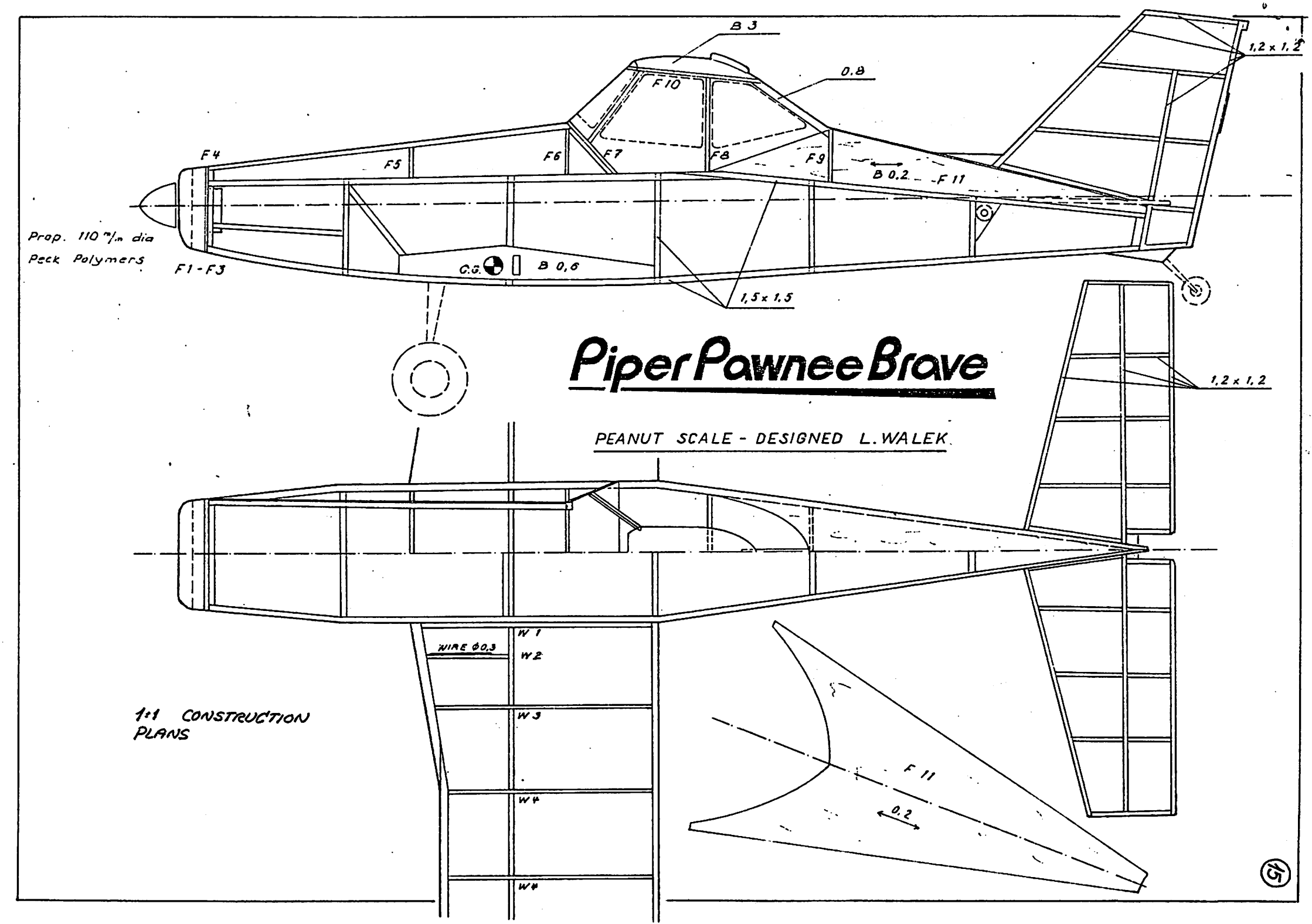


71% OF CONSTRUCTION PLANS. MULTIPLY WITH 1.41 ON A COPY-MACHINE.

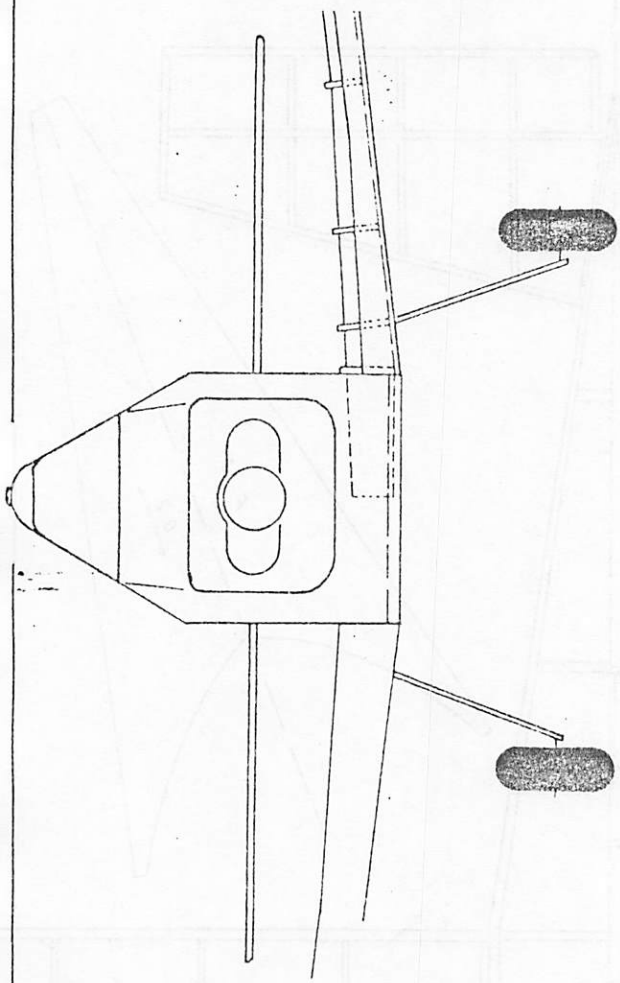


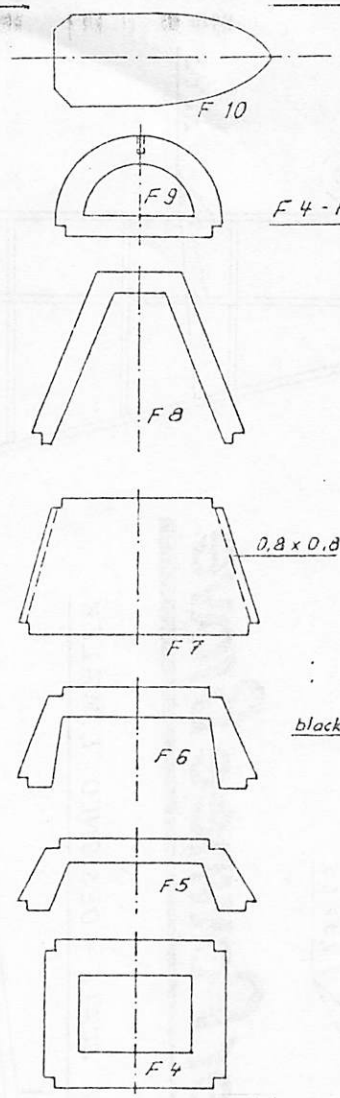
Piper Pawnee Brave

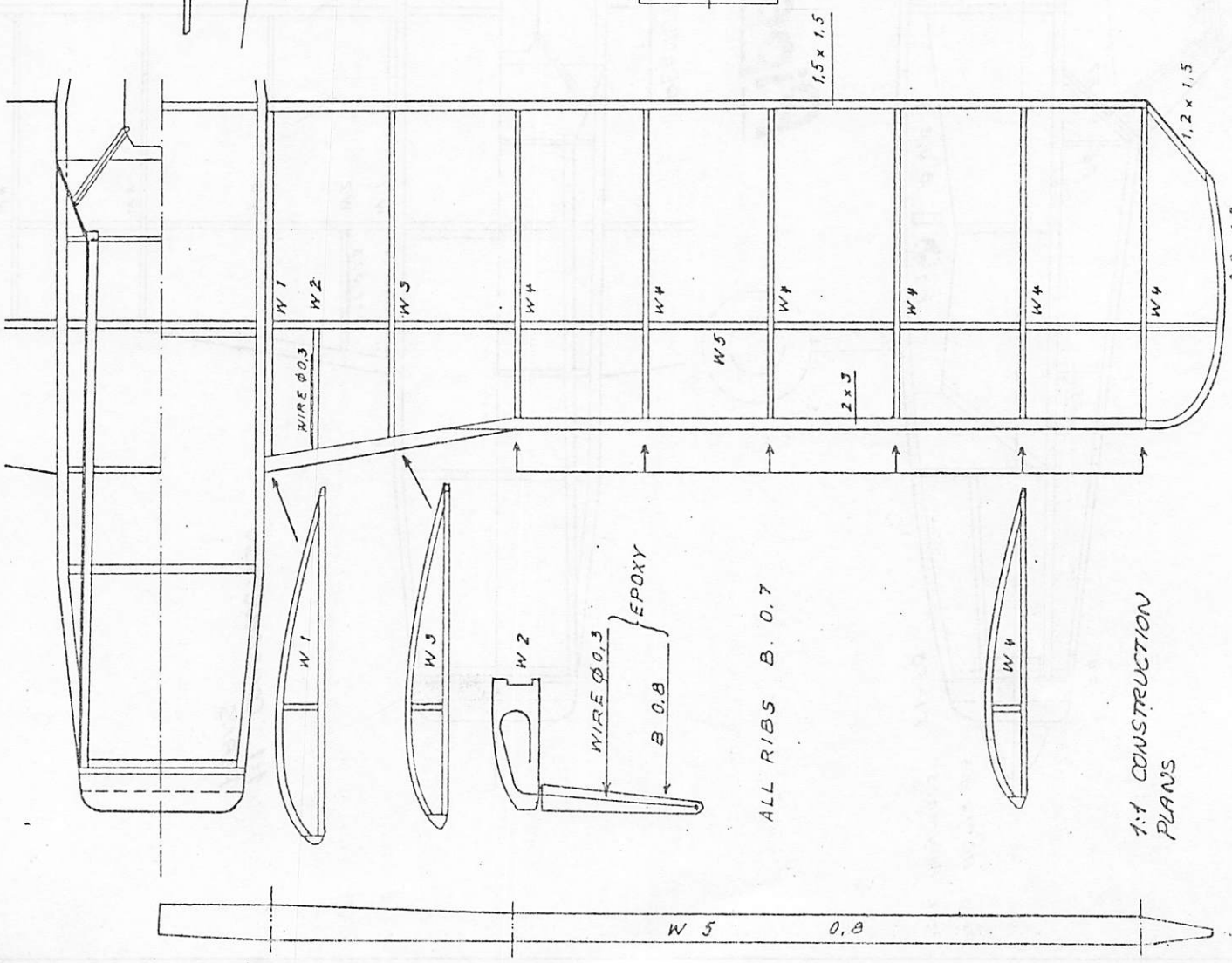
PEANUT SCALE - DESIGNED L. WALEK


B 3
1,2 x 1,2
0,8
F 10
F4
F5
F6
F7
F8
F9
B 0,2
F 11
Prop. 110 m/m dia
Peck Polymers
F1 - F3
C.G.
B 0,6
1,5 x 1,5
Piper Pawnee Brave
PEANUT SCALE - DESIGNED L. WALEK
1,2 x 1,2
W 1
WIRE Ø0,3
W 2
W 3
W 4
W 4
F 11
0,2
1:1 CONSTRUCTION PLANS
15

PIPER PAWNEE BRAVE
BY L. WALEK







1:1 CONSTRUCTION PLANS