INDOOR NEWS AND VIEWS

Bud Tenny

June 1960

In the last issue we hinted that year-round indoor activity in the Dallas area was about to become a reality. In a subsequent "extra" we announced the start of regular indoor flying sessions at the Walnut Hill Recreation Building, Walnut Hill Lane at Midway Road. Mention was made of plans to set up perpetual plaques as awards for flights which boost the high time at our new site. These plaques are still in planning.

The first flying session produced the longest flight at a flying session so far - 6:23 with a B Paper Stick. "Baby Bee" models were up to 3:20, flown by Juniors. All the long flights were "ceiling scrubbers".

Our second session had a little more activity, even though the session was held in the middle of the week. High times were about half a minute behind the first session, inspite of higher performance capability of some of the models. Two and one half hours seems to be the bare mimimum of time to really "zero in" on flight trim. The "Baby Bee" models were up over 4:00, with 4:16 tops for them at thepresent time.

For those who haven't heard the details of our new site, the ceiling is 20' 6" high, with flush lights and no obstructions over the area of the basketball court. Drift at night is usually negligible, but uneven heating by the sun causes drift in the daytime. There are bleachers for spectators and there is lots of space around the edges for boxes and equipment. This is an excellent place to learn the fine points of indoor, and we are getting very good co-operation from the people in charge. We can repay our debt to them by attending in force, wearing soft-soled shoes, and keeping our mess cleaned up.

NEWS OF FAI ELIMS

So far, we don't have an Eastern correspondent, so we don't know who won the Elims there. Joe Bilgri won the Western brawl with 32:40, and Lew Gitlow was second with 31:50. The Central Elims was a wild one - Carl Redlin - 24:28.4, C. Sotich - 24:25.2, Bob DeBatty - 24:18.9, Phil Klintworth - 23:51.8, Dick Kowalski - 23:33.2. Real close!! Since Joe Bilgri made the team, Kowalski thinks he might get to go as team manager.

INDOOR WOOD

Some of you have seen Gitlow's latest mimeo letter - he made a real good offer. For $3.95 he has a beginner's assortment of wood consisting of a minimum of 25 sheets. Our assortment was 27 sheets, some 1/16, some 3/64, lots of 1/32, 1/64, 1/100, plus a couple of .022" sheets. This is not his best wood, but well worth 14¢ a sheet. For anyone contemplating starting indoor or helping a bunch of boys get started, this is a real good deal.

INDOOR MODEL BOXES

After talking to several of the more serious flyers in the area, we found we weren't the only ones with a problem of storing and carrying indoor birds, particularly the big ones.

After careful investigation, we decided to try heavy cardboard boxes. We tried discarded instrument shipping boxes, which were so large that we put four models in each one. After carrying four models to a contest to fly one, we decided that individual boxes were a better solution.

A local container manufacturer was contacted, and the boxes we had in mind were quoted between $3 and $4. If at least twenty boxes were ordered at the same time, the price dropped to about $2 per box. These boxes are like a shoe box with a liner in the bottom, and the lid is as deep as the box. In effect this gives a double layer of heavy cardboard all around the model except part of the top. The price is reasonable,

and the boxes make a neat solution to the problem. The boxes pack into cars easily, and only one model is exposed at a time when flying.

We designed three boxes, class B - 11"x25"x10", Class C - 13"x30"x10", and class D - 16"x35"x10". These are large enough for one model, several props, and a container for motors. The boxes come knocked flat, and must have the flaps taped down. We also glued the flaps together, and glued the bottom liner down, but this operation is a minor job. Drop us a line if you're interested in these boxes.

FLIGHT TESTS ON PROPS

Since the prop-motor combination is so important to long flights, we have started a series of experiments with propellor design, using our B Paper Stick as a flying lab. This model has 92 sq. in. wing area, weighs .055 oz. without the prop and motor, and measures 11" between the hooks.

As a starting point, flight times were recorded with prop #1 at the first flying session in the Walnut Hill site. Three flights with 1600 turns in a 15" loop of .055" Pirelli gave 5:58, 6:01, and 6:23. From 2' altitude to the ceiling took about 18 seconds, and the flight dragged on the ceiling for over 3:00 each time.

Prop #2 was developed from #1, with lots of flare built in. #3 was modified from Dick Ganslen's B Paper prop. Both #2 and #3 controlled the climb well enough that there was no dragging on the ceiling, and the props didn't hit very often. Apparently tip vortex action from the props was high enough to keep the model off the ceiling.

The flight tests were made one Saturday at Walnut Hill with special permission, and we spent 2½ hours with the model down long enough between flights to change props and motors. Several different motors were used to let the Pirelli rest between flights, even though we weren't using maximum turns. Plans for the props are on the last page.

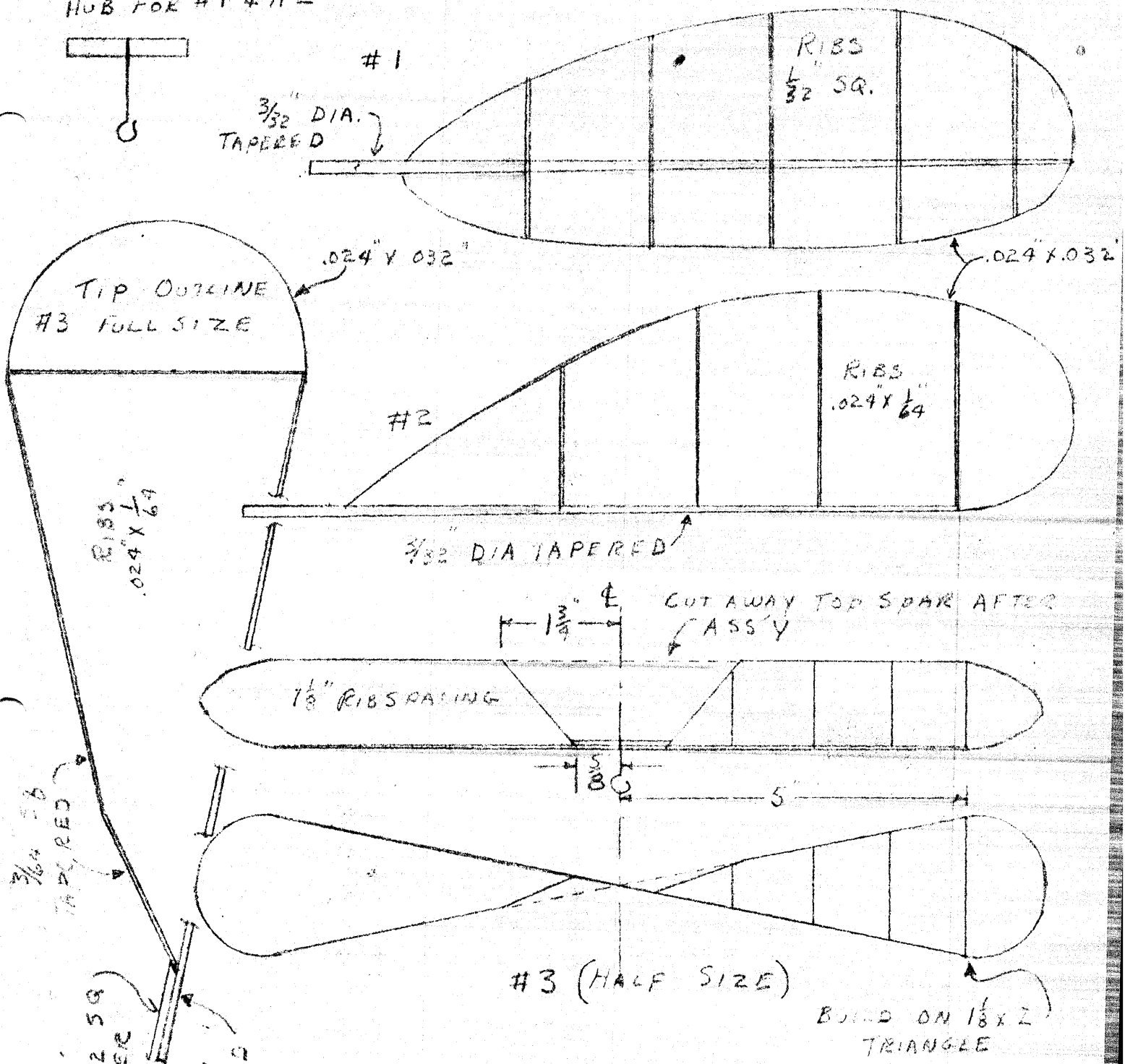
Prop	Motor	To Ceiling	Total time	Turns	Comments
#2	.060x11"	2:07	6:07	960	Stalling, ½ rowof knots
#2	.060x12¼	:23	5:38.6	1200	prop wobble
#2	.060x12¾	:18	6:13.3	1200	fixed wobble
#2	.060x13½	1:03	3:41	960	Yea Gods!
#2	.060x13½	1:07	3:53	1050	Oh Well
#2	.060x13½	:43	5:10.5	1120	slight stall on climb
#2	.060x13½	:42	5:02	1250	long stretch on wind
#2	.060x13½	:34	5:12.1	1200	short stretch
#2	.060x13½	:44	4:57	1280	long stretch
#3	.060x11	:32	7:00.7	1200	dead stick
#3	.060x11	:32	5:11	1200	hit obstruction
#3	.060x13½	:57	3:32	960	stalling
#3	.060x13½		3:30	960	didn't reach ceiling
3#	.060x11	:18	5:24	880	dead stick, hit wall
#3	.070x12½	:28	4:49	880	prop wobble & stall
#3	.070x12½	:34	5:05	880	dead stick

CONTESTS AND FLYING SESSIONS

Category I Record Trials - Sanction #553 June 10 - 10 AM till 6 PM Last chance at Category I records until fall. Site and events to be announced. Special event for "Baby Bee" planned.

Walnut Hill flying sessions 7 PM to 10 PM. Bring watches, wear soft shoes, Keep area clean.
June 16, June 30, July 14, July 28, Aug. 11, Aug. 25. Its a Ball!!

Nats Warmup - Organized flying session to trim Nats ships. Category II site - to be announced. Will be sanctioned. July 15???



#1 & #2 built on a 1½"x2"x6" block ala' Bilgri. The hub is an 8" strip of jap tissue rolled with thinned glue on a 3/32" dia. form. Blade stubs fit tight in hub at desired pitch angle, may be spot glued.

#3 is built like any two spar prop on 1 1/8"x2" triangle. the hub filler is glued in after the diagonal L. E. pieces. By cutting away top spar, the prop will flare more. Sand L. E. thinner to equalize flare, or increase it. keep ribs light so they will flex. Wood sized not too important on these props, rear spar must be stiff, front spars control flare to a large degree. Experience with your wood is key to matching flare to model and ceiling. Use 1/8" minimum camber on all these ribs, keep covering loose enough for flare.

INDOOR NEWS AND VIEWS

APRIL 1961 BUD TENNY

CONTEST NEWS

According to the Category I record information we have, there were two records set at the Eagles' Record Trials. Nickey Jones made application for a Junior B Stick record of 3:58.4, and Dutch Antonisse applied for a Senior B Paper Stick record of 3:42.8. This was the first model Dutch had ever built, and his first contest.

Nickey Jones showed patience in learning to live with his B Stick model. Each time it hit an obstruction it would spin in. All his official flights were low, but on his record flight he trimmed to to stay below the beams, and made almost four minutes. Good flying!

The FAI Round I Practice Session is now history, and it was one of the most enjoyable sessions we've had all year. The temperature was ideal, and the air in the Drill Hall was pretty calm. Without the usual contest pressure, everyone had a good time and a lot of models got trimmed for the FAI Elims.

Dicky Mathis and Ken Querman demonstrated the systematic approach to trim, with very good results. Dicky started with flights of less than three minutes and went up to 7:19. His early flights went almost to the rafters, but the long one barely cleared the lights. Furthermore, almost every flight was made on the same number of turns! This is the type of flying that is needed for high time in low ceiling work. At this rate, Dicky will be one of the top contenders for low ceiling records.

Ken went one step farther with the systematic approach and made notes on the conditions and results of each flight. The fact that he has been flying the same model for about two years, and has done over 7 minutes in the Drill Hall shows the value of a reliable model and systematic trimming methods.

Karl Ridenour showed the possibilities of small airplanes as he worked his 34 square inch B Tissue up to 4:59 before the fuselage broke. It will be interesting to watch this Junior and see how he does in lower ceilings.

CATEGORY I RECORD SUMMARY

EVENT	JUNIOR	SENIOR	OPEN
H.L. GLIDER	0:36.9	0:31.8	?
HELICOPTER			
ORNITHOPTER			1:06.8
AUTOGYRO			
A R.O.G.			
B PAPER STICK	4:07.0	3:42.8 (pend.)	9:26.0
B STICK	3:58.4(pend.)		7:64.0
B CABIN (R.O.G.)			
B CABIN (R.O.W.)			
C STICK			14:01.0
C CABIN			
D STICK			

As you can see from the chart above, the Category I record list is still incomplete 5 months after the Category was set up. There are over 25 records just begging to be set, if this information is right. It is up to us to get on the ball, before the WIMAC boys spot the open door. Will we let California beat us to the punch, or will we prove to them that we know how to fly model airplanes in Texas also?

The way to do it, as was demonstrated at the FAI Practice Session, will be to fly regularly in low ceiling sites. Part of these flying sessions can be in less than 20' ceilings. By trimming for maximum flights in the low, low ceilings, the records will be easy marks when we move over to a good site.

That last point is important enough to repeat. Just as with any type of model, regular flying sessions produce the maximum performance a model is capable of. Regular sessions will cause the unreliable models to quit or get fixed, and the best importance of prop and motor will be found for each model. Don't worry too much about the weight, just learn about that particular model and trim for the maximum time under the low ceilings.

NOTES ON THE PARLOR MITES

At the FAI Practice Session, our Parlor Mite flew for over 3½ minutes on the first flight. It climbed almost to the ceiling and landed dead stick from 1200 turns at launch. The trim wasn't changed from flights in our living room, and no further effort at trim was made.

This flight seems to indicate that three minutes is possible in our living room, but 2:36 is the top so far. It must burn up too much power dragging the ceiling. At present, the climb from 2' to the 8' ceiling takes about 7 seconds. If the climb can be stretched to about 30 seconds without losing the present 1:45 average, we will have made a good start toward low ceiling technique.

The best props so far have been about 5 3/4" diameter and fairly low pitch. If flare can be built in also, the initial torque burst should spread out and help the cruise. Drifting into obstructions is still the major cause of low times, but this is part of the game.

The "BABY B", a 43 Square inch relative of the Parlor Mite can be flown in the living room. In a four-flight series just finished, three of the flights were longer than 2:15, and the fourth flight ended in a corner at 1:47. Since this is a legal model for competition, and can be built in about four hours, we ought to set up an event around this model or a similar one just for fun. This one has been a lot of fun in the past 24 hours.

COMING INDOOR FLYING SESSIONS AND CONTESTS

April 9 - FAI Round I Eliminations. Livestock Colisieum in Fair Park, Dallas. 10 A.M. until 6 P.M. Category II record trials if there are enough timers. There is a trophy for high time and a trophy for the high Junior flight.

Middle of April - Indoor Session in Garland - Tentative

April 30 - Cliff Model Clubs Category II Record Trials. Dallas NAS Drill Hall. 9A.M. until 4 P.M.

NEWS OF INDOOR SITES TO COME

In Garland, the new community house will be a 30' arch which stretches out about 70' across the base. Apparently the ceiling will be pretty clean, with only light fixtures to hang on. This one probably will be easy to get.

In Richardson, the new high school gymnasium will be 28' of very clean ceiling. This should be the site which will enable us to beat Wilmington at their own game. We have been assured that this will be available, but we don't know just what the cost will be.

The Greenvill Avenue Gym, site of the Eagle's Record Trials, will not be turned into a bus barn as had been rumored. It will continue to be available for flying sessions and contests.

Steps are being taken to try to get the Livestock Colisieum on occasion for Category II Record Trials. This one will probably have to be sponsored from outside sources due to the cost.

Richardson is building a new youth community center and we are trying to find out if there will be indoor facilities there.

Has anyone checked into the Poly Youth Center in Ft. Worth? We hear that there is a fairly high ceiling in that building. This might be a prime Ft. Worth Category I site.

Someone needs to check into the North Side Colisieum in Ft. Worth to see if it can be used. We hear that it was several years ago.

Arlington State College is closing in the beams in their gym. We need to find out what the new ceiling height is and if this site can be used for indoor.

With this many good sites available to us in this area, we can become the most active indoor area in the country. Let's do it!

INDOOR NEWS AND VIEWS

MAY 1961 BUD TENNY

The time is rapidly approaching when the concept of year-round indoor activity for this part of the country will become a reality or else fall by the wayside.

It appears that recent developments may make it possible to have one Category I and two Category II sites in Dallas at little or no cost. In addition, a practicesite may become available twice a month.

The key to success of failure for this program will then be our our participation. All those concerned with scheduling indoor events agree that the indoor sessions should not conflict with other model activities. In order to prevent conflict, indoor activities might be scheduled as 4-6 hour sessions on Friday or Saturday evening.

If the program catches on, it may well be that everyone who wants to fly indoor will have to attend the summer sessions to keep up with the state of the art.

Early this season, less than six minutes was good for first place in the Drill Hall. At the next contest, 6:18 was tops. The practice session for FAI resulted in a top time of 7:19. 9:57 won the FAI Elims, but this was an out-of-town contestant. The highest local time was 7:56.5, and eight of the official flights were longer than 7:20. Two of these flights were B Paper Stick models, and one was a Junior with a C Stick.

The point of the statistics is that the improvement leads us to expect that 6 months of monthly contests will produce 8-9 minutes in Category I, over 11 minutes in the Drill Hall, and over 15 minutes in the Livestock Coliseum if it becomes available. Furthermore, we don't expect the increased performance to come from newer and better models, but from better prop-and-motor combos on existing ships. If a model has proved to be stable and consistent, there is probably no reason to junk it until every possible flight trim and power combe is tried.

The models which win consistently will be those that are flown most often under widely varying conditions. Just as it takes a lot of flights in both wind and calm to trim an outdoor model, temperature, humidity, obstacles, and air conditions will have to be accounted for. Few of us really know just what our rubber is capable of, and the field of props is wide open.

PLANS SERVICE

Since there are only a few kits available for indoor work, we have decided to set up a plan service. Available now are the Parlor Mite, Baby "B", and the EASY "B". These are good beginner models, fall together quickly, and fly very well.

We have Dick Ganslen's B Paper Stick model, from which we can work up plans if it's OK with Dick. This is the model which succeeded to boost the Open B tissue record to 8:57 at the FAI Elims. Dick thinks this model is capable of over 10:00 in the Coliseum, and we agree.

Carl Summers has agreed to furnish plans for his B Paper, which is a compact, high performance model that uses no wire bracing. His high time so far is 7:57 in the Coliseum.

If anyone is interested, we will loan copies Dick Kowalski's "Detroiter" (C Stick) and B Paper models. Both these models currently hold records, and both fly well in the hands of beginners. It would be nice if someone would volunteer to transfer these plans to tracing paper so they could be duplicated easily.

CONTEST NEWS

The FAI Elims had a very good turn-out, both contestants and spectating modelers. Thanks to Bill and Betty Bell and their crew, Bill Chennault, and several others, we had a light work load and were able to spend most of the day flying. Flight Times were:

9:57.0 - Jerry Hughes	8:23.1 - Dick Ganslen	7:56.5 - Kit Bays
7:54.5 - Jerry Murphy	7:47.5 - Carl Summers	7:36.8 - Bud Tenny
7:25.9 - Ken Querman	7:20.5 - Nickey Jones	6:12.3 - Dick Mathis
5:23.2 - Tommy Walker	4:39.6 - Karl Ridenour	4:38.4 - Mike Fedor
3:10.1 - Don Chancey		

In contrast, the letter we got from Lew Gitlow the other day gave the following results of the Moffett FAI Elims: Rambo - 35:53, Gitlow - 32:40, Bilgri - 27:16, Cover - 26:37, Aronson - 25:19. These are category III flights by the old masters and real good times.

Three indoor contests in 48 hours! That really kept us hopping to keep up. Friday night - Parlor Mite contest at Cliff Cloud Climbers meeting to raise money for trophy fund. Basic rules: 10" max span, paper covered, all-balsa prop. We had a ball, and nine contestants went over 2:00 under the 12½' ceiling. 1st - 2:38.6 - Jerry Murphy, 2nd - 2:33.5- Dick Mathis, 3rd - 2:32.3 - Bud Tenny. 17 entries total.

Saturday evening the Garland Aeromodelers held a small contest with a big list of events. Seventeen entries were made in 6 events, Top times in 24' ceiling, everyone taking it easy for the contest the next day. As usual, mike HLG times were tops, but the Aeromodelers fought it out among themselves with balsa birds. This stirred up a lot of indoor interest in Garland.

The Cliff Model Club's Sunday contest capped off the trio with over 20 contestants. The results thru 2nd place were:

Junior HLG
0:42.1 Nickey Jones (mike)
0:29.3 Don Chancey (mike)

Senior-Op. HLG
1:03.3 Dick Mathis (mike)
0:33.1 Ken Dougan (Balsa)

Junior Rubber
3:40.8 Don Chancey (mike)
3:23.0 Karl Ridenour (B Paper)

Sr.-Op. Rubber
7:37.8 Jim Clem (B Paper)
6:18.8 Dick Mathis (C)

Helicopter (Special event)
1:04.4 Kit Bays
We goofed and didn't get 2nd place time

The usual wide variation between mike and balsa HLG shows up here. It hardly seems fair for Ken to get 3rd after a hard day's work to get a real nice time like that. We're not knocking mike HLG, we just favor peaceful co-existence instead of competition between two different

types of models.

Rubber was hard-fought all morning and part of the afternoon until Jim Clem showed up. In true modeling tradition, his bird was finished except for bracing about 5 A.M. Sunday morning. On the 5th flight off the drawing board, rubber was all sewed up by this fine flying model. Jim is no newcomer to indoor, in fact his prop was older than about half the contestants "on Deck". This flight is high time for the Drill Hall, and this is the slowest flying paper model we've seen. The rate of sink during let-down is very low. We will probably see a new B Paper record soon.

Also worthy of comment was the close rivalry between Dick Mathis and Ken Querman. Ken was only 2.7 seconds behind Dick and pushing hard. It seemed that this contest was decided by who got hung up on their best flight. There were so many models hung on lights and beams that Ken hardly had time to fly all day, since he used his long pole to retreive the models. Everyone in the area owes Ken a vote of thanks for this service.

INDOOR SUPPLIES

MicroDyne Precision Products
715 East D Street
Ontario, California

Jem Supplies
2979 Dudley
Lincoln, Nebraska

Bernie's Hobby Shop
209A W. Jefferson
Dallas, Texas

Richardson Hobby Shop
116 E. Main St.
Richardson, Texas

MicroDyne and Jem give good service on mail orders, and their catalogs are well worth having just for the handy hints and indoor info they contain. Edgar Seay, 108 South Lee St. in Irving is now cutting indoor wood to your specs. If we've overlooked any local hobby shops, please contact us and we will correct the oversight.

COMING CONTESTS

A sanction will be applied for for Category I Record Trials on June 10. The site and events will be announced as soon as possible.

We also plan a Nats Warm-up session with Category II Record Trials a few weeks before the Nats.

CATEGORY II RECORDS

EVENT	JUNIOR	SENIOR	OPEN
HL GLIDER			
HELICOPTER		1:03.3 (pend.)	0:24.0
ORNITHOPTER		0:24.6	0:37
AUTOGYRO			
A R.O.G.			
B PAPER STICK	10:29.7	6:38.1	8:57
B STICK		7:56.5 (pend.)	15:19.0
B CABIN			
B R.O.W. CABIN			
C STICK	7:20.5(pend.)		19:50.0
C CABIN			
D STICK			

INDOOR NEWS AND VIEWS

JULY 1961

BUD TENNY

When Bill and Betty Bell left on their way to Florida, modelling in this area suffered quite a loss. We don't mean that model activity will lessen, or become less important, but this area is losing two of the most active model enthusiasts we have known. Bill and Betty are active in so many types of model activity, and have made their activity felt in so many places, that we will all miss them. To our knowledge, the Bells have never refused to help with any model event if it were humanly possible for them to help.

The members of the Ft. Worth Jacs will have cause to miss the Bells even more than other groups in this area. In the Jacs Bill and Betty have built up an extention of their own fierce competitive spirit and sense of fair play. We are sure the Jacs will continue in this spirit, and we hope they remain one of the most active clubs in Texas. We wish the Bells the best of luck in their new home and community, but we are sorry to see them go. Their address: General Delivery, Del Ray Beach, Florida.

NATIONAL RECORDS

Indoor flyers in this area have set nearly 15 Category I and Category II records this year. Since we haven't had consistent flying at contests and record trials, and sanctioned events have not been on a regular schedule, this is quite an achievement.

By now, many indoor records have reached astronomical times, and future records will be much harder to set. The possible exception will be those events which require a special airplane. Few people will build just for a record, so some categories will take a while.

Although the Nats are held in a good Category III site this year, we doubt there will be many records broken at the Nats. However, we predict that the top five places in Open Paper Stick will be over 20:00, and the top five places in Open Stick will be over 30:00. If indoor flying continues to grow at the present rate, the event may take more than one day to run off at future Nats.

CONTEST NEWS

The beautiful free flight testing weather attracted some indoor flyers away from the June 10 Record Trials, so there were only eight AMA license holders present. Karl Ridenour test flew his new B Paper with a borrowed prop, and made several flights over four minutes, and one flight over six minutes.

Our own B Paper struggled up to 7:05 with the #3 prop which had been modified to increase the flare. The leading edge had been thinned quite a bit, but we overdid it. Flight tests seemed to indicate that the best rubber size would have been .065", but we were out of it.

Jim Clem and Ken Querman were also out later in the afternoon. Jim turned 6:10 with a #3 type prop and the same loop of .055" Pirelli he has been using for some time. When he gets up nerve enough to use .060 on that 20 year old fuselage, we should see some new times.

Ken brought out something new - three and four blade props. As you watch one of these props, you get the impression of much higher RPM than they really turn.

We noticed that the drift which had plagued us once before during the prop tests never built up. Since the air conditioners hadn't been on at all that day, there probably wasn't enough temperature differential to start the drift.

LOW ASPECT RATIO?

A couple of letters from Dick Ganslen have reported experiments with low aspect ratio wings. He implies that all else being equal, the flight speed and the prop RPM are lower on low aspect ratio wings.

There are some theoretical considerations which would support the idea of increased efficiency on low aspect ratio wings. First, even though low speed aerodynamics is not well defined, a more favorable Reynolds Number exists on the wider chord. If the C. G. is forward and the angle of attack is higher, the lift/drag ratio should increase, and then the flight speed could be lower. Probably only a series of flight tests would prove anything about this layout from the design standpoint.

Certain practical considerations make the low A/R design more attractive also. For a given area, the spars and structure can be lighter because of the shorter moment arm for flight loads. Consequently, the bracing can be less elaborate for a featherweight wing with sufficient rigidity. The low A/R should result in a short coupled airplane with better stall recovery, tighter turn, and better rough air handling, which is advantageous for low ceiling models. For the mike ships, it is easier to pour a short, wide sheet of film, and you need less work bench space to maneuver. We feel there are enough potential advantages to warrant a test model. That comes sometime after the Nats!

LIQUIDS AND STUFF

Since January we have tested several types of liquids for use on indoor models - microfilm, balsa glue, and stickum for condenser paper. By now we have arrived at several preferences which may be of interest.

Actually, we use several different types of glue in building a single model. Thinned Ambroid is fairly good for most uses, but it is heavy and tends to pull thin balsa. However, we use it exclusively to mount thrust bearings and motor hooks.

For framework and fuselage construction, we use MicroDyne Cement and our home brew interchangeably. The home brew is made as follows: Put one 15¢ tube of Testor's "B" cement into a 2 oz. jar, add 1 teaspoon of Ambroid, ½ teaspoon of flexible collodion, and fill the jar with Butyrate thinner. The result is a thin glue which makes a strong joint and leaves no visible fillet. For comparison, Micro Cement also shrinks without pulling, but leaves a slight trace of fillet. Both are very good for almost any construction work. We also keep Jement around for glueing prop spars to forms and wings to bracing jigs. It holds tight, but can be easily cut loose when desired.

Condenser paper can be fastened down with many things, but our favorite is old microfilm solution. If you have a batch which has aged and you don't trust it, keep it and try it for covering paper models.

Microfilm solutions are numerous, but our experience has been that the ones easy to handle are not as durable as the new "Dry films". Most nitrate films are easy to handle and easy to pour, but don't last a long time on the model and continue to shrink.

The best nitrate film we have used apparently was originated locally by Frank Krystinik. The formula: 12 parts nitrate dope of brushing consistency, 4 parts flexible collodion, 2 parts amyl acetate, 1 part castor oil. This is excellent film to practice handling and covering with, and it pours easily on room temperature water.

The two dry films we've tried are Jemfilm and MicroDyne Film. Both make a film which can be deadened over heat or aged for some time on the hoop, both are lighter than nitrate films of equal thickness, both can be rolled in jap tissue for field repairs, and both are hard to pour big sheets with.

Jemfilm as it comes in the bottle seems to need a little castor oil added for easy pouring, about 3 drops/15 cc. By adding the oil, we increased the ease with which the film spread, and the final film

was a little softer until it was deadened over heat. But these films are strong! We have a hoop of blue and green film which has held and bounced a dime many times. Our Class C wing was once accidentally hit edge first by a sheet of typing paper - no damage! We don't recommend this test for microfilm, but this time it passed.

So far we haven't been able to pour a 35" sheet of MicroDyne Film, but tests have shown that the water temperature is very critical. The color of the finished sheet also seems to depend on the water temperature. One thing about this film - it spreads much better than Jemfilm. However, we have had trouble with the front of the spreading sheet wandering off to one side and producing a discontinuity in the finished sheet which tears when the film is picked up.

If anyone has completely mastered the technique of pouring either of these dry films, let us know and we'll pass it on. These films are hard to get used to - they stay loose on the model like condenser paper. They can also be used to cover like condenser paper, but you have to learn to quit breathing while you do.

FAI TEAM COMPLETE

Right after the June issue, we received a card from Pete Sotich which stated that Bill Bigge of Washington, D.C. qualified in the Eastern Elims at Lakehurst with 30:35.8. From other sources we hear that Dick Kowalski has been appointed team manager. We wish the best of luck to Joe Bilgri, Carl Redlin, and Bill Bigge in their trip to Europe late this summer.

JUNE FLYING SESSIONS

Both June flying sessions at Walnut Hill were a little sparsely attended, but the air was still crowded with models at times. New prop tests at the June 16 session pushed our high time to 7:20.4. Edgar Seay and family were out to help time, and Edgar, Jr. was keeping records on all the flights made.

The June 30 session was the best from the standpoint of quality, if not quantity. Jim Clem had rigging troubles after a late start, but we are still impressed with the potential this model has. Jim's fixing to go into business for himself, and this keeps him plenty busy. Terry Hamer got his 70 sq. in. paper model going, dead stick at 4:45.5.

Our Nats Paper Stick managed to hang up six times out of seven, but that one flight pushed the high time to 7:36.3, landing with less than a row of knots in a 14" loop of .065 Pirelli.

CONTESTS AND FLYING SESSIONS

NATS WARM-UP - JULY 14, Dallas NAS Drill Hall, 6 PM * 10 PM. Sanction has been applied for, so there will be Category II Record Trials. Note that this cancels a flying session at Walnut Hills.

WALNUT HILL FLYING SESSIONS: July 28, Aug 11, Aug. 25. 7 PM - 10PM Walnut Hill Lane at Midway Road. Wear soft soled shoes, bring stop watches and winders. Present high time - 7:36.3.

LATE WILMINGTON NEWS

Dave Copple reports that their June 9 Record Trials (Category I) brought out Frank Cummings in A ROG @ 9:54, and Jim Kagawa in B Paper @ 11:25. He also reports much indoor activity in Wichita, Kansas, but no details.

INDOOR NEWS AND VIEWS

AUGUST 1961 BUD TENNY

INDOOR IN FT. WORTH!!!

Since Guy Rogers attended the Nats Warm-Up session, he has been busy on locating sites in Ft. Worth. There are several possible sites, and the first session is in the Rosedale Recreation Building west of Poly High School on Rosedale St. in Ft. Worth. It should be a really top site, come on out, bring stop watches and winders, wear soft-soled shoes. For further info contact Bud Tenny at AD 5-2212 or Guy at JE 5-7533. The time is this Friday, Aug. 4, 7 to 10 PM. Continued use of this site will depend upon attendance.

INDOOR AT THE NATS

Everyone who is anyone in indoor flew at Lakehurst on Monday - and several who are definitely on the way up did their stuff also. For us, the first time in a "big barn" was a real thrill. By the middle of the day, the place was crowded enough that it was hard to fly.

We busted out on our predictions - but the men in the know are agreed that the high humidity was the reason for the low times. It rained outside a couple of times, there were even out-of-sight indoor flights when the lights failed. Luckily our D Stick was low enough on the official flight that we could keep it in sight by the feeble light from the windows in the hangar doors.

Our Paper Stick collapsed when Tom Finch (Cat. I A ROG record) wound it the way it should be wound. The D flight lasted 20:28.5, which tickled us much. That was 14th out of 48 entries, strictly little league, but we still walked on air for a couple of days.

Impressions and tidbits from the indoor Nats --- Big 300 D's took over in Stick - Bilgri's winner typical - .060 oz., 8" chord, 5/16"deep ribs, 21"x38" prop, blueto gold film, Joe said the heavier film was used because he shipped by Air Express----Finch prefers braced props for FAI in big barns - 140' climb in 2½ min., then cruise---the Detroit flyers used flare even in the hangar---Bob DeBatty had a C Prop like our #2 (prop article in the June issue) - sez extreme carein picking wood is necessary to equalize flare---Our D and one other the only low A/R birds we saw - most were 6½ to 7 to 1 A/R---Lew Gitlow's film very popular, but Carl Redlin's models used Kowalski's film - Dick promised to send some after the trip to Europe so we can try it.

Kowalski said weight isn't real important for competition - his record holding C Cabin was way over the typical .048 oz.---well braced and trimmed ships much better than featherweights for competition--- Dick has built C Stick at .027, they last one day at Record Trials - the light weight comes from careful picking of light wood and real light film. With red-green film our 220 D picked up .007 oz. - could be .003.

Many people using very light film---Gitlow reported to be using lighter than gold-bronze film---Finch's A ROG 15" span, 9" prop, .025" Pirelli, weight minus motor - .009 oz.!! Cummings reported to have one about .007---Finch planning real light 300D for Moffett Record Trials - about .055 with 22"x40" prop on 17" loop of .080 and 2000 turns - RPM predicted to be 45. Will have short stick for lighter weight - 15" stick and 14" boom.

We helped Bob Champine of Virginia repair crumpled D Wing - real tricky without jig---watched awe-struck as he deliberately cut 1/32" out of spars and re-glued them to loosen the bracing wires - the high humidity had swelled the wood until the bracing was too tight---we learn something new every day, even if we don't believe it!

NATS RESULTS

7:23,4 CABIN - 23:01.4

JR. - Joe Salateny - [illegible]; Sr. - J. Baggi - 13:50.9; Open - Kowalski

HAND LAUNCHED GLIDER

JR. - Salateny - 0:59 SR. - Baggi - 1:07.2; OPEN - Ron Wittman - 1:14.5

PAPER STICK

JR. - S. R. Stackhouse - 11:37.5 SR. - David Ullman - 13:26
OPEN - Phil Klintworth - 18:21; Kowalski - 17:54; A. Rohrbach - 16:47; Ed Stoll - 15:59.9; T. Zongoph - 15:46

STICK

JR. - Dennis Kargol - 10:22 SR. - J. Baggi - 20:56.6
OPEN - Bilgri - 33:16; James Grant - 31:53; Ron Plotzke - 31:05; Klintworth - 29:46.6; Kowalski - 29:31.6

NATS WARM-UP SESSION

The July 14 Nats warm-up session produced a larger number of participants than any previous summer session. There were some new-comers to the scene who will make it tough to win indoor contests coming up.

Guy Rogers and Tom Lloyd came over from Ft. Worth, each with at least one microfilm bird. Tom's small C was beautifull built, but his high ceiling prop made it climb like the Sultan FF Tom is known for. After hanging it in the lights twice, Tom gave up until he could build a new prop.

Guy Rogers brought a Parlor-Mite sized paper job which did nearly 4 minutes a couple of times, but his Featherette stole the show. He took it easy at first, then really leaned on the winder. It came down at 6:58.4 with over a row of knots left. Guy was a little disappointed until he found a glob of cobwebs in the thrust bearing. Wonder how long it would have flown without the payload?

Our own ships trimmed in OK for the Nats, with 7:30.4 on the D, and 7:56.3 on the Paper Stick. We were careful to keep the D below the top railing on the balcony by using low power, but the high time on the Paper Stick was with 1200 thurns.

Dave Wilson was out, and did his top time for the Drill Hall at 5:05. Dicky Mathis had prop trouble all evening - school is keeping him off the bench about now.

Several of the HLG flyers were out also, and we were chased by mike Tow line gliders also. Don Chancey's balsa gliders were really racking up the time, including one flight of 0:40.8. Dunno how he does it, but it sure is good.

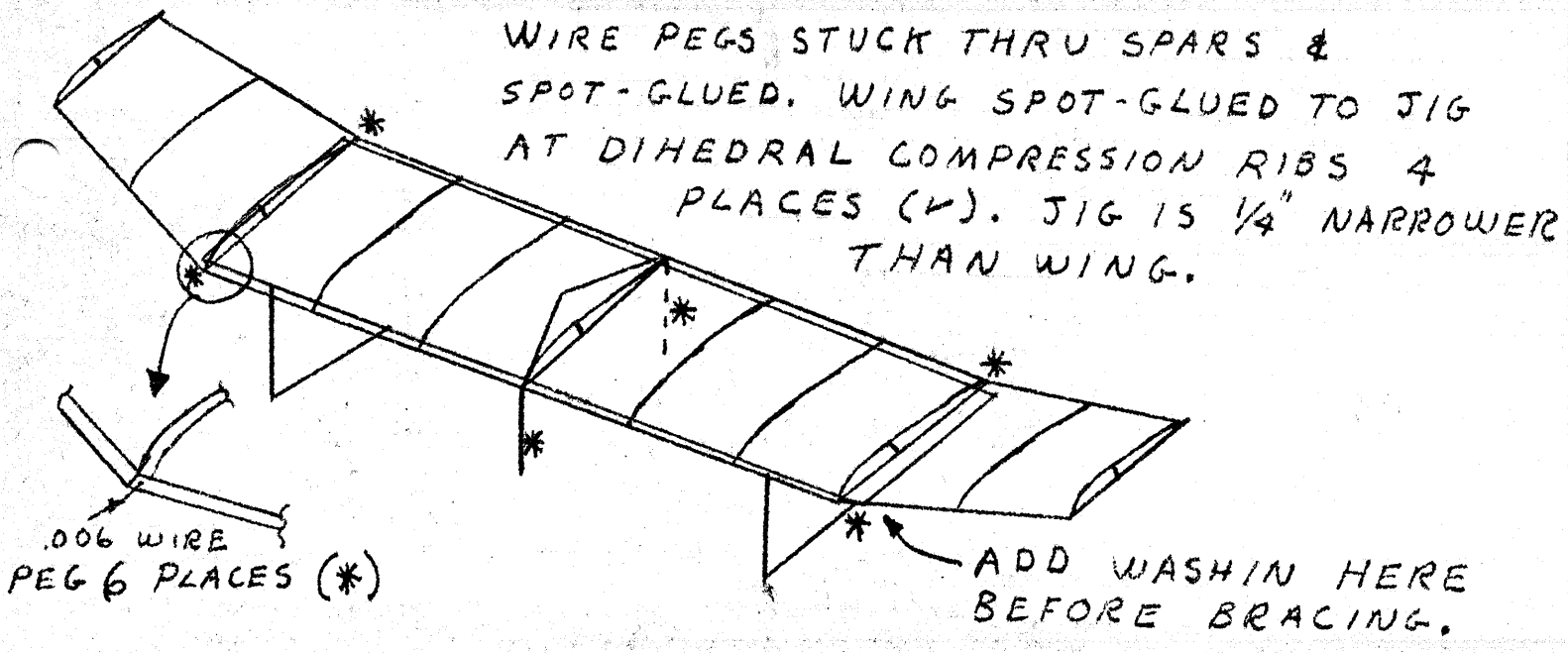
WALNUT HILL SESSIONS

Our first session at Walnut Hill was cancelled by the Drill Hall session, and information is skimpy about the July 28 session. However, Guy Rogers came over from Ft. Worth, and Richy Earle came out with a very neat Paper Stick. We predict that Richy will be one of the tough seniors to beat in months to come. Jim Clem had top time for the evening, after reworking the bracing on his model. His flight of 7:20 fulfills our hopes for that model, and when he gets a new boom that model may be another toughie again.

INDOOR TRIM

For some time now, most of our airplanes have been flying with the C.G. behind the 50% point. This wasn't intentional, our new props were lighter than the early ones and we didn't retrim the ships.

When the Nats Paper Stick and our A ROG came along, they were balanced ahead of the 50% point. Test flights pointed out a surprising (to us) fact - flying on the verge of a stall isn't the best trim. By lowering the incidence in small steps, we improved the climb and gained about 20% during the cruise. The new C.G. point is also less critical.



BRACING INDOOR MODELS

All of the more fragile indoor models depend upon bracing wires in a variety of configurations for part of their strength and most of their alignment. Anyone who wishes to build very light and reliable indoor models will have to cope with bracing wires sooner or later.

Several people have commented to us on the anticipated difficulty of bracing a model. Since we're the lazy type, we usually use shortcuts for most of our building. Actually, if the need arises, primary bracing can be added to a wing in about an hour.

Bracing jigs are almost a necessity to ensure alignment of the wing and to furnish a handle to move it during the bracing. In the simplest form, a jig is a heavy cardboard or balsa platform braced for rigidity and alignment, and equipped with legs for support. The jig must be constructed so both wing posts are visible during bracing to check for alignment. (See sketch above)

One of the shortcuts we mentioned is to use small wire pegs where the wire crosses the framework (see sketch). These pegs furnish a place to hook the wire before the wire is glued, so the tension can be equalized in all the bracing. The real time saver in using the pegs is that the bracing wire can be cut to length, weighted on one end, and the entire wing strung with one operation.

One end of the wire can be glued to the wing at the right front corner, then the wire strung across the bipod to the left rear corner, down to the peg on the rear post, up to the right rear peg, across the bipod to the front left corner, down across the peg on the front post, and across the peg at the starting corner. Let the weighted end of the wire swing free and check that the wire is in place on all pegs and all segments of the wire have the same tension. Then glue the wire in place at each peg and the job is done.

INDOOR FLYING SESSIONS

WALNUT HILL RECREATION BUILDING - 7 PM to 10 PM Aug. 11, Aug. 25
Walnut Hill Lane at Midway Road - Dallas

ROSEDALE RECREATION CENTER - 7 PM to 10 PM Aug. 4 for sure, Aug. 18???
West of Polytechnic High School on Rosedale St. - Ft. Worth

INDOOR NEWS AND VIEWS

BUD TENNY

August 15, 1961

EXTRA! EXTRA! EXTRA!

We received post cards almost simultaneously from Pete Sotich and Phil Klintworth relating details of the FAI Indoor World Championships held in England last week. We Won!!!!!

Individual Placings
1st - Bilgri - 37:49 (U.S.)
2nd - Rieke - 35:11 (Germany)
3rd - Bigge - 34:56 (U.S.)
4th - Hamakainen - 33:03 (Finland)
5th - Read - 32:48 (Great Britain)
6th - Henell - 32:00 (Germany)
?th - Redlin - 30:58 (U.S.)

Team Totals
1st - United States - 103:31
2nd - Finland - 94:09
3rd - Germany - 89:32
4th - Great Britain - 76:08
5th - Hungary - 57:56

At the Nats, conversation with some of our team members indicated that Great Britain was considered to be the major contender for top times, especially in view of intensive flying at Cardington by members of the British team.

It would appear that the unpublicised practice session in Lakehurst for our team paid off well. Although it was said our team was taking it easy during the practice session, they were turning over 30 minutes.

Another bit of startling news from Pete's card was the flight Max Hacklinger of Germany made after the contest was over. This was probably the longest indoor flight ever made - 44:20. We presume this will be recognized as a new FAI record, and it is a mark which will stand for some time. This is even more outstanding if the flight was made with a FAI class airplane, since the big 300's here haven't done over 40 minutes, unless this happened at Moffett last weekend.

COMING INDOOR SESSIONS

Walnut Hill - August 25 7-10 PM. Bring watches, winders, wear soft soled shoes. Richy Earle upped the building record to 8:42 with a B Paper Stick - better come loaded for bear!!!

Sycamore Park Recreation Building - Rosedale St. at Sycamore Park in Ft. Worth. ~~Tentative~~ - August 18 7-10 PM. Building record is 7:24, set by Richy Earle. Call Guy Rogers at JE -5-7533 for more details.

157.24
27.65
129.59
157 24

INDOOR NEWS AND VIEWS

BUD TENNY

SEPTEMBER 1961

As we near the end of the first summer of scheduled indoor flying in this area, it is time to take stock of our past efforts. There were seven Walnut Hill flying sessions and two at the Sycamore Park site in Ft. Worth. The average attendance has been about eight flyers with ten models between them, and an average of ten spectators not counting the extra modelers who helped wind and time. From past experience we can say that twelve or fourteen flyers at one of these sessions would be a crowd, since there is not a lot of floor space to work with. Even then, no one would get to fly a lot, since five models in the air at once is taking a lot of chances with good models.

Class B Paper Stick models have been on the top of the heap, since everyone had one and flew them enough to find out what they would do. Richy Earle's "El Cubo"(our Nats design) now holds the Walnut Hill high time at 8:42, and the Sycamore Park record at 7:57. Almost no one has been regularly flying microfilm models except Guy Rogers and Tom Lloyd, who have some of the prettiest models we've seen.

The sport of flying indoor models is losing the status of step-child all over the country, and is definitely on the upswing locally. All of the clubs in this area who plan indoor contests this season will benefit from the summer sessions, whether they participated or not.

It is probably significant to notice that all the members of the U. S. Indoor Team came from areas where indoor flying is considered to be a serious sport rather than something to do when the weather is too bad to do anything else. Although this area fielded two members of the FAI FF teams, none of the Texas indoor flyers made sufficient showing to warrant a trip to Detroit for Round II.

There are several modelers in the area who enjoy indoor flying but refuse to take it seriously, contending that year-round indoor conflicts with outdoor contests. However, the clubs in the Detroit area and in California mix indoor and outdoor successfully. And in California at least, there are outdoor contests at the rate of about two each weekend all year around. Maybe it is an accident of birth or geographical location, but California's achievements in all phases of modelling seem to be the result of taking all types of models seriously. Surely, in this area where the activity is far less, we have the ability to mix the various types of models without strain.

At the end of the last indoor contest, Texans held quite a few indoor records. From that good start, we have fallen so far behind it will be difficult to ever catch up. Our excellent record in outdoor flying has not resulted from flying at only two or three contests each year, and never making test flights and holding informal flying sessions. If the rest of the United States ever hear of Texas indoor flyers, it will be the result of <u>regular</u> scheduled activity month after month, rather than a mere twenty-four hours of flying in three contests a year.

MORE FAI NEWS

The month's mail brought more news of the FAI Indoor Finals in a letter from Dick Kowalski. In spite of getting the models to Lakehurst OK, all the U. S. Team models were damaged during the trip to England. The damage was minor for Bilgri and Bigge, but Carl Redlin had major repairs to make. Proof that the repairs came out OK is that Carl made the high time of the first practice session with 32:23.

All thru the meet, drift across the hangar was a problem to all the teams. Drift spoiled Redlins flight in the third round, putting him into the wall 138' high at over 26:00 and spoiling an almost sure 40:00 flight. This held Carl to eighth place with his first round flight of 30:58. Both Bilgri and Bigge caught the drift in the second round, with 6:15 and 18:26 respectively.

By sifting thru the info Dick sent, we found the best flights by rounds to be: First round - Bigge - 33:07; second round - Bigge - 34:56 (his best); third round - Bilgri - 37:49 (high time of the meet).

From Dick's account, it could have been almost anyone's meet right up to the end. If Max Hacklinger's flight of 44:22 had been during the contest instead of his best official flight of less than 23:00, Germany would have won by about four minutes. Incidentally, Max's flight was with a FAI model and is both a new German record and a new World record.

Other FAI news: Bilgri has resigned as Indoor chairman, apparently has recommended Kowalski to replace him. Dick says there will probably be some changes in FAI Indoor scoring, possibly there will be six flights with no delayed flights and score the top two. This sounds like a good thing for AMA indoor also. So far there is no indication whether there will be FAI Indoor every year or not.

FLYING SITES ARE NEEDED!!!

As of October 1, we probably will not be able to continue flying at Walnut Hill until after the end of the basketball season. The sessions now scheduled for September 8 and 22 are the last at Walnut Hill until further notice. The problem is one of attendance, but not one we can solve by digging up more flyers. Over thirty basketball players can use the gym in an evening, and we would need a comparable crowd to be able to get in. However, not more than fifteen flyers can make use of the gym at once, and even then we would have to take turns flying.

There is promise of relief from several sources, including other buildings under the Dallas Park Department. One official has been hopeful that space can be found in Fair Park after the State Fair is over.

The Garland Aeromodelers will in theory be able to reserve the new Garland Recreation Building for free, provided there is no conflict. That site should be good for about ten minutes, after we have flown in there once or twice, and it has about twice the floor space that Walnut Hill has.

We are sure of being able to get the Livestock Coliseum whenever we have a sponsor, which will limit us to about two contests per winter season. The same may also apply to Will Rogers Coliseum, but this isn't definite yet.

We can probably continue to use the Sycamore Park building as long as there are no conflicts, on the same basis as the August 18 session. There was a collection taken up to pay the janitor's salary, which came to less than 50¢ per person, and that was agreeable to everyone.

The Drill Hall at Dallas NAS can be made available for several flying sessions in addition to the regular contests, as long as there is enough attendance to keep the Navy happy. This building has the disadvantage of having wrecked more models per session than all the other places put together. As everyone knows who has flown there, the problem of hanging models is terrific and not easily solved.

To summarize, there are plenty of places to fly year-round, but we need to keep the attendance up at most any contest in the sites that are free or nearly so. At the rented sites, the attendance problem still is with us, but we will have to make the sponsor happy instead of the owner of the building. Our indoor program will go over very well as long as it is supported by everyone interested in indoor. However, it will not continue active for long, even during the winter, without a supporting summer program. There are quite a few people presently attracted to the sport who won't build indoor models and store them all year just for the chance to spend twenty-four hours per year flying.

NEWS FROM THE FLYING SESSIONS

Indoor activity was high in August, with four sessions in all. Two were at Walnut Hill and the other two at Sycamore Park in Ft. Worth.

Some of the high times of the month were our best yet, such as Richy Earl's 7:57 in Ft. Worth and 8:42 at Walnut Hill. Tom Lloyd turned a time of 6:18 in Ft. Worth with his C Stick, and we managed 7:21 with a B Stick there. Jim Clem is still having rigging troubles, but he is in the 7:00+ bracket now.

Our juniors, Terry Hamer, Mel Gray, Paul Jones, and Guy Rogers III are all flying the little B paper jobs, although Terry finished an "El Cubo" in time to make several flights over 5:00 at the last Walnut Hill session.

Elwin and Roberta Wornell attended both Ft. Worth sessions, the first one to watch and the second to fly their Featherette. They have another Featheretteon the way, and we are glad to have them join us.

Some prop experiments were carried out at these flying sessions, flying 14" and over props on B ships. A 14" monospar adjustable gave us 7:58.2 on our old B Stick at Walnut Hill, and the same ship did the 7:21 flight with a 14 3/4"x 26" prop on .065" rubber at Ft. Worth. It would have been better for us to fly only one airplane that night, the results surely would have been better. Three hours is really not enough time for more than one airplane, unless is is well trimmed to start.

FLYING SESSIONS TO COME

Walnut Hill - Sept. 8 & 22, 7-10 PM. Wear soft-soled shoes, bring watches and winders. Last chance in this site for over four months, lets make these good ones! Walnut Hill Lane at Midway Rd.

Sycamore Park Recreation Building, East Rosedale St. at Sycamore Park in Ft. Worth - Check with Guy Rogers for coming sessions, JE 5-7533

Livestock Coliseum, Fair Park, Dallas. Preliminary arrangements have been made to use the Coliseum one Saturday morning late in September, if there is sufficient interest. Since this represents a major concession on the part of Fair Park officials, we should make every effort to have a large turn-out. The time would be 8:30-12 AM, take it or leave it. We would have to pay the porter's salary, about $5. These plans are tentative, We won't push it unless there is enough interest. Preliminary plans for a contest in the Coliseum are being made, we think we have a sponsor. This will also hinge on the interest in a contest to be held in November.

WEST COAST NEWS

Preliminary testing indicates Tom Finch's new 300 is capable of over 40:00, weight .055, 22-40 prop with 17.5" loop .080 rubber. He's building a spare also. Good luck on Sept. 17 at Moffet, Tom!

Wally Miller's Easy B turned 10:03.5 at Wilmington Aug. 11, and 10:47 unofficially at the Armory the next day. Tom fears they will lose the Armory to a Space Age Museum soon.

The Easy B sounds like fun -all-balsa prop, solid fuselage and boom, surface outlines must be straight lines, max. span 18", 3" chord, well suited to small sites. Easy B anyone?

MORE ON MICROFILM

Thanks to tips from Kowalski and Finch, we now know how to get big sheets of film - use a big tank. With a 3' x 5' tank, it took us half an hour to fill and empty the tank and make 3 12" x 36" sheets of Jemfilm and Microdyne film. Tank made from 1" x 2" pine, covered with plastic.

INDOOR NEWS AND VIEWS

BUD TENNY OCTOBER 1961

BILGRI DOES IT AGAIN!!

How long will it be until the U. S. has a member of the Forty Minute Club? Just as a famous flight several years ago created a Thirty Minute Club, Max Hacklinger of Germany has become the charter member of the Forty Minute Club. And Joe Bilgri almost made it! Hal Cover tells the story in a letter we received this week:

"Now for the results of the record trials at Moffett hangar (180'). There were two new records set. Joe Foster set a new C record of 34:05 with a conventional C design which weighed .030 oz. Next came along the amazing Mr. Bilgri. He flew his FAI winning ship in the morning and was knocking off 30-33 minutes like it was nothing. The real interesting flights came in the afternoon. When Joe launched his FAI ship it stalled, so he relaunched without re-winding, losing 1-1½ minutes in possible flight time. While this ship was up, he then launched his new 300 sq. in. ship (weight .059 oz.) on its first flight. When the 300 was launched, he had about 25 minutes on his FAI ship. This ship stayed up for 37:35 even with the loss of time due to the faulty launch. Then he took the FAI ship down to the other end of the hangar and flew it again while the 300 was still in the air. At 35 minutes, the 300 drifted rapidly into a corner where the air was very turbulent and spoiled his chances of making 40 minutes. As it turned out, he got a flight of 38:41 (on the plane's first flight!). While this flight was coming to an end, his other ship had about 20 minutes on it. Well, you guessed it--this flight ended up 39:39. Three flights in a row like that makes you wonder a little!!!! So now, all the indoor stick records belong to the West Coast."

It looks as if Joe is already shooting for a place on the next FAI team! Good flying, Joe!

FAI INDOOR NEWS

Dick Kowalski reports that AMA has given the green light for plans to hold World Indoor Championships at South Weymouth next year, and he has to work out details and set up firm plans in preparation for the FAI meeting in Paris next month.

From our limited understanding of the situation, this boils down to the following: If the FAI decides to hold Indoor next year, and if the U. S. bid is accepted, the next World Indoor Championships will be in the United States. If you think there was a scramble for team places this year, you ain't seen nuthin' yet! This will be a trip that almost anyone can afford by stretching a little, and the resulting competition should be fierce.

Back on our soap box, but we feel there are at least ten flyers in the Ft. Worth-Dallas area who have shown promise in the past and could develop enough to make Round II at least. We should agitate for Round II to be held in a central location next time, such as the Kansas City Municipal Auditorium. That is reported to be a really fine site, and it is close to all parts of the Central U. S.

If Ft. Worth-Dallas is going to be represented at Round II, there will have to be a lot of work done on FAI around here, and this means several contests and flying sessions in tall buildings around here. So far, nothing has been finalized on these sites, but one possible sponsor put it this way: "How much can your group raise toward the event?" A gentle hint that we may receive help if we help ourselves! We've had it too easy for a while, with free flying sites for most of the contests and flying sessions - is it worth it for higher contest fees to be in a really good site?

A NEW FORMAT?

All the other '62 models have a new look - so why not? Although the change makes INDOOR NEWS easier to read and lighter for the postman to carry, the main purpose is to increase the news space and versatility of presentation.

News is now coming in from several parts of the country, much of it on a first-hand basis. It is now our hope that the coverage can be expanded even more in months to come. Whenever possible, technical info from the other centers of indoor activity will be a feature along with the news.

NEWS FROM AROUND THE COUNTRY

Just after the last issue, Bill Dunwoody reported on the August 27 session in Lakehurst. Bill Bigge was out of town, so the rubber flying was hotly contested, even if the times weren't high. Top rubber time was 14:47.5 by Joe Pusateri. Top glider times (balsa): 1:09.9 - Dick Miller; 1:02.5 - Joe Pusateri; 1:01.0-Bob Hatschek. Several members of the Thirty Minute Club were present for the record trails, but no one set any new records. A Junior, Steve Stackhouse, raised his own ROW Cabin record to 3:06.4.

A big package of stuff came from Chuck Tracy, Aviation Editor of the CLEVELAND PRESS. We quote from Chuck's letter: "We have more than 300 Junior age flyers alone, plus another 150 seniors and open. There are 15 to 20 planes in the air all the time -- when the gliders fly the number jumps to 50. You actually have to have your name on your glider or you may not get it back.----Our meet has grown to such size that we have to rent the Central Armory across the street for test flying." We scanned reports of past contests, noted six age categories (Dodo, bantam, fledgling, Jr., Sr., Open) in each of four events. There are several girls listed in top winners, too!!

From Bill Robinson in Wichita comes a report of continued efforts to find a regular site to boost their indoor promotional efforts. The Wichita flyers have some capable leadership with Bill, Stan Chilton and John Law heading up the efforts there.

George Aldrich bought quite a bit of indoor stuff on his last trip up here, and is planning to see if indoor will go in San Antonio. There are some hot builders down there, maybe there is a good chance.

We had a little time to chat with Harry English at the Southwest Model Championships, he said there is some indoor activity in one of the coliseums in Lubbock. . Harry promised to try to find out who is leading the effort and put us in touch. Harry enjoys indoor and has ships ready to fly, but can't find a site in Oklahoma City.

RULE CHANGES

As usual with our hobby, someone is always trying to change the rules. Ken Dougan, member of the FF Contest Board reports that the proposed change in Paper Stick is now being voted on. At last report, the vote was 4 for, 1 against, 1 abstaining, and 5 votes to go. This change requires solid stick and boom and unbraced wing in Paper Stick. We will publish the complete rule if it passes.

The loophole in the HLG rules (mike HLG) is under fire from at least three proposals, including one advanced by Cliff Model Club in Dallas. No further word on these proposals at present.

Some people at the Nats were wanting to make Class D area unlimited, figuring that a 450 sq. in. job can still be carried in a car. What a sight that would be! Our guess is that the pros would build a .075 oz. 450, and the prop would be bigger than most Class B's!!

HOW TO POUR THIN FILM

Recently we asked Dick Kowalski for comments on pouring thin sheets of film consistently, and this is his reply:

"To pour the very light stuff, there are two conditions which must be satisfied. One is that the maker must be cabable of pouring the correct amount of solution on the water, at the correct rate of flow from the hand. The flow must be very smooth and constant and I find that usually the faster motion is best. This takes time to develop, so don't be impatient. The other thing is the solution, the wrong solvents in the solution will not allow the pouring of light film, and this is a critical balance of two solvents and their evaporating rates.

Contrary to what some people think, warm water does not necessarily help to make sheets thinner or more consistent. This is a throw-back to prehistoric days when films contained slow solvents and it would help to use warm water to evaporate the solvent at the correct speed. I suggest you try cooler water, perhaps around 70 degrees. If this doesn't work, you can also try adding a hint of Methyl Ethyl Keytone. I've never tried acetone, but it has similar characteristics and might also work well. It's pretty difficult to tell you how to get light sheets without actually watching what is going on."

MORE ON PROPS

Lately we have been adding flare and diameter to our props, which permits larger rubber sizes without spinning the model. On the last page you will find details of the latest test prop.

Besides an increase in size, the major gimmick on this prop is hinged ribs. As shown in cross section, each rib pivots around the spar on a tiny tissue tube. Blade helix is held by the glue joints at A and B.

Except for the hinge, construction is conventional monospar on a carved block as shown. The block shown is 25" pitch, but it can be narrowed for higher pitches. The test prop was made adjustable pitch and weighed .0142 oz. The ribs were .024" square, the outline was .024" x .032" from 5# stock. Spar diameter at the hub is 5/64", and the hinge tubes are 1/16" I.D. More flare will result from softer outline wood, and from an increase in area shown in dotted lines.

WEIGH THOSE MODELS

To improve the strength-weight ratio of indoor models and find out when some weight has been saved, it is necessary to weigh parts of the model. Since these parts range from .0005 oz. to .070 for a complete model, sensitive scales are needed. The scales shown on the next page can be adjusted to the required sensitivity easily.

The construction is simple, so only a few features will be mentioned. Two methods of primary balance are used, the sliding weight on the left beam for coarse balance and the 4-40 bolt for fine trim. Since humidity affects the beam considerably, the fine trim will have to be set before each weighing. The outriggers are used to lower the C.G. of the beam to just below the pivot. Theoretically the scales would be infinitely sensitive if the C.G. were exactly on the pivot, and the beam won't balance with a high C.G. Adjust the outrigger weights until the required sensitivity is reached.

When the scales are finished, keep records of component weights during the various stages of construction, fly the model, and make the next one lighter. Tom Finch builds models just about as light as anyone, and he even weighs individual wing ribs for a 300.

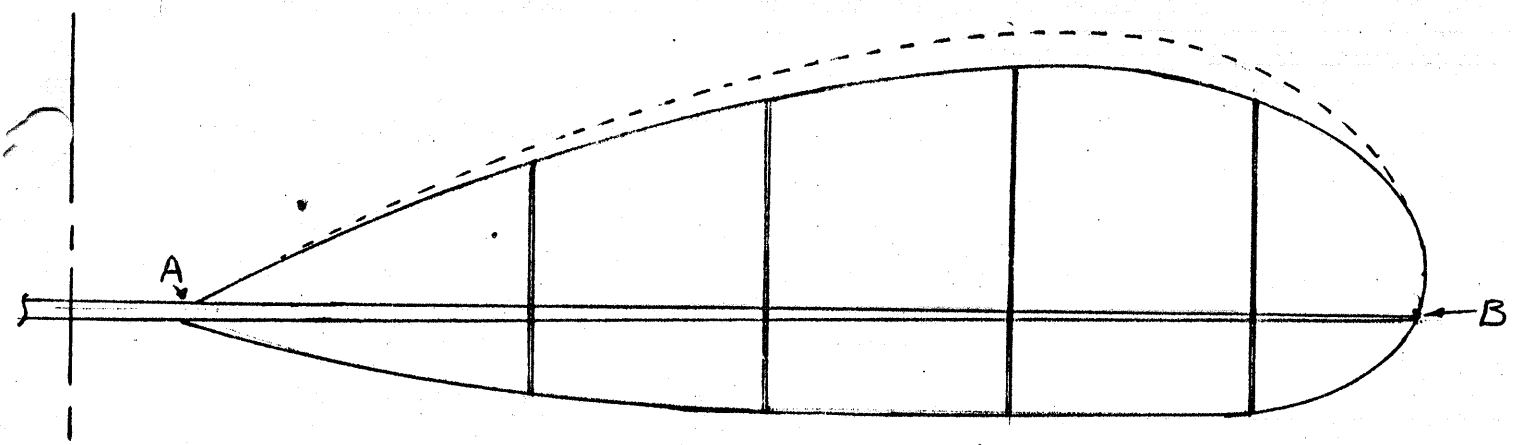
In the long run, it is no good to save weight in a manner which weakens the structure too much, or upsets the model trim. For instance, a super-light prop is murder on a model which was almost tail heavy to start. If the motor stick distorts after a weight-saving binge, you lose. But, for each .001 oz. saved in the tail surfaces, the prop can be about .002 lighter without affecting the C.G. location. Here are some examples of light models for comparison:

Item	Finch-300	Finch-B Stick	Finch-Paper Stick	C. Sotich FAI
Prop	.011	.005	.0075	.008
Stab	.005	.0015	.005	.005
Wing	.018	.007	.019	.017
Rudder	.001	.0008	.0015	.001
Stick	.016	.0085	.010	.015
Boom	.004	.0014	.0018	.004

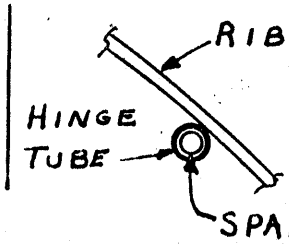
Seriously speaking, it is difficult to achieve these weights or even come close. An FAI stab is the closest we've come, ours is the same size as Chuck Sotich's FAI stab, weighs .0055 and is very floppy. It definitely should be braced, whic would add least .0007 oz. It is also problematical if ships of this weight would survive long anyplace except in Will Rogers or the Livestock Coliseum. Note the difference in weight between the B Stick and B Paper components - area for area this represents the weight of condenser paper (about .013/100 sq. in.)

FLYING SESSIONS

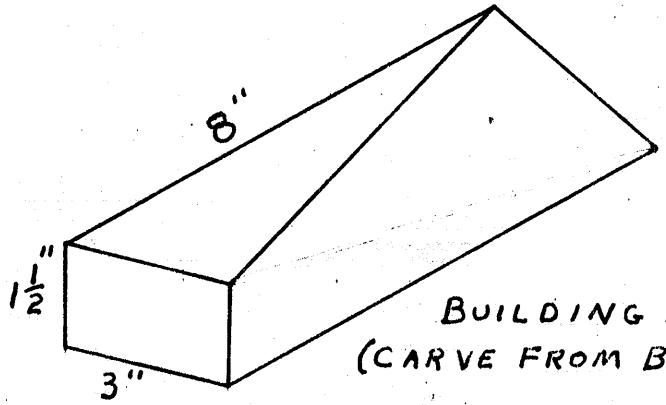
The only flying sessions in September were at Walnut Hill. Top times moved up to 8:54.6 (C Stick). Terry Hamer pushed the Junior high time to 7:05.5. Dozens of "go for broke" flights hung up, with strong drift at both sessions. New schedules for the winter season are not set, the Ft. Worth site is under repair, and we are still hopeful of getting into the Garland Recreation Center in October, and into the Automobile Building in November. Call Guy Rogers at AT 4-2634 in Hurst, and Bud Tenny at AD 5-2212 for further flying info.



BLADE OUTLINE (DRAWN FLAT)



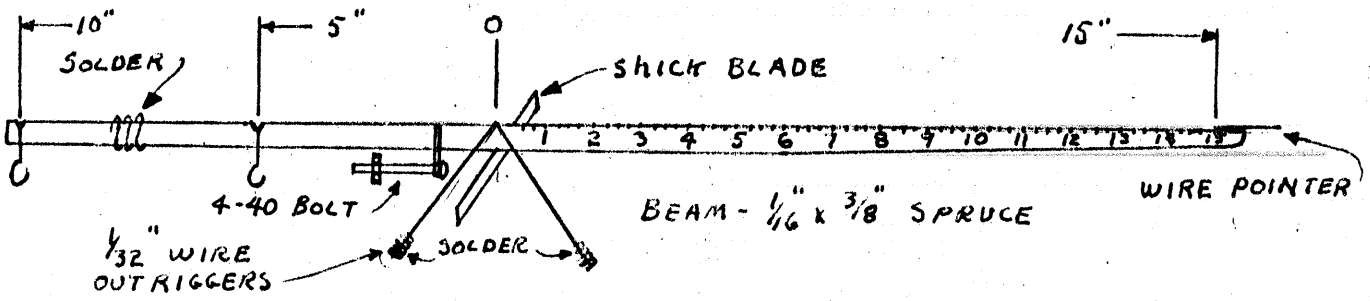
BLADE CROSS-SECTION AT EACH RIB

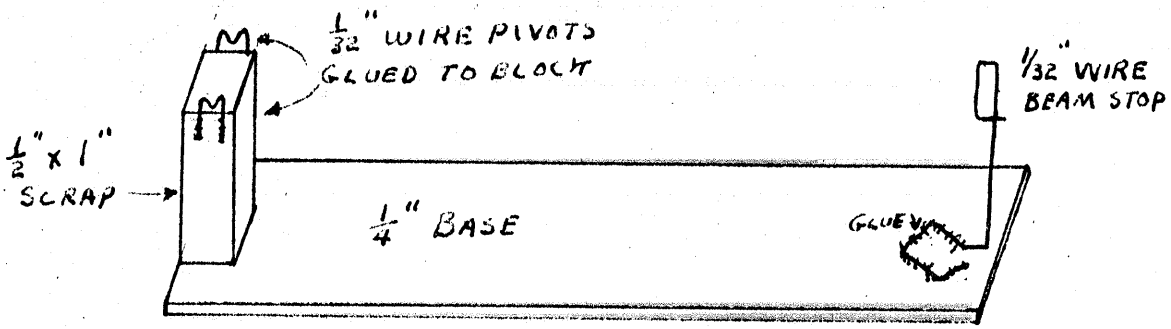


BUILDING FORM (CARVE FROM BALSA BLOCK)

RIB TEMPLATE

FOURTEEN INCH CLASS B PROP





INDOOR SCALE - SENSITIVITY .0005 .02
(SEE TEXT FOR ADJUSTMENT & CONSTRUCTION)

INDOOR NEWS AND VIEWS

BUD TENNY

"Voice of N.I.M.A.S."

DECEMBER 1961

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

In the November issue it was announced that the National Indoor Model Airplane Society had been formed by Dick Kowalski, Pete Sotich, Dave Copple, and Bud Tenny. Several dollar's worth of postage later, and after Richard Miller and Chuck Tracy joined the fold, this is what we have: A national organization dedicated exclusively to the increase of indoor model activity, with membership open to all who are sincerely interested in the future of indoor flying.

The purposes of NIMAS, as outlined by Kowalski, and agreed to by the other members are:

1. To act as the voice of indoor flyers in the United States.
2. To promote indoor in any way, but particularly by encouraging newcomers.
3. To act as a clearing house for comments on indoor rules change proposals.
4. To act as point of origin for ideas that are becoming rules proposals.
5. To provide, when possible, changes in technology, advanced design data, and any other technological information about indoor models.

NIMAS, as the only national organization of, by, and for indoor flyers, can help indoor flying in many ways; but to achieve the goals set out above, we need every dedicated indoor flyer to join us. The six Charter Members have agreed to handle the work connected with NIMAS, but this is not to say that we won't accept help with these jobs. Just try us and see - provided you follow through with your self-appointed tasks!

If you join NIMAS, what can you do, and what will you get for your money? First, since INDOOR NEWS is the "Voice of NIMAS" and the paper is fast becoming the best source of information on indoor flying, you will keep abreast of the latest news and information.

Second, through a system of ballots published in this paper, you will be able to express your opinions of existing regulations, rules proposals, etc., so that NIMAS can present the best possible cross-section of opinion to the Contest Board.

If you wish to present a rules proposal for evaluation before submitting it to the Contest Board, space in the paper is yours. If you have an idea you think will help others, put it in the paper. If you have a problem about indoor activities, send it to us.

NIMAS can not make indoor rules, but it can save time on rules proposals by refining them into the best possible proposal before it is submitted for adoption. NIMAS can not sponsor new groups directly but will have information and suggestions for the asking. NIMAS may be able to help secure better sites for contests and FAI Elims. Time will tell just how much NIMAS will be able to do, but NIMAS needs your help to accomplish anything.

How much does it cost? $3 per year, at the present time. When the membership reaches about 125 members, the cost-per-member will decrease, and existing memberships will be extended accordingly. For your membership fee you get a one-year subscription to INDOOR NEWS, decals for your car and equipment, and a chance to help guide the future of indoor flying. It's a bargain!

****FAI INDOOR REPORT****

Just under the wire comes this report from Dick Kowalski, relaying from Frank Ehling:

"The U.S. bid for the next Indoor Championships was denied due to the inability of other nations to attend, but the need to hold Indoor Championships during years in which there are no Free Flight Championships was recognized and the bid was awarded to England to hold the Indoor Championships at Cardington during 1962.

The method of contest for Indoor was changed to the best 2 flights of 6 attempts, there no longer being any form of delay or unofficial flights. Each start is a flight.

It is now legal to steer the model with a captive balloon to avoid hangups, providing that the model does not remain in contact with the balloon or string for more than 5 seconds or that no more than 2 contacts are made with the model during any one flight. It is assumed that if more than legal time is used, then the timing for that flight would be ended."

****FAI INDOOR COMMITTEE REPORT****

To date, the Committee has set up the following plans for Team selections for the 1962 World Indoor Championships:

Local Elimination Contests

1. No rounds will be used.
2. Six flights using FAI Rules.
3. No minimum entry (contestants) required.
4. Top 50% will qualify for quarter finals.
5. To qualify for quarter finals, a contestant may fly in any or all eliminations in his area.

Quarter Finals

1. Only qualified flyers may fly in this one. Quarter Finals will be held in Dallas, Chicago, & Detroit.
2. Six flights using FAI Rules, rounds maybe.
3. Contestants may fly at any or all quarter finals in their area to qualify for semi-finals.
4. Qualifiers for the semi-finals (Central area only) from the quarter finals:
   Dallas - top 6.
   Chicago - top 6.
   Detroit - top 12.
   The large number from Detroit allowed due to the large number of entries in the Cleveland and Detroit area.

Semi-Finals

1. Six rounds with one flight per round, using FAI Rules. Two rounds the first day and four rounds the second day.
2. Only quarter-finals qualifiers may fly.

Entry Fees

Local Elims - Open, $2, Senior $1.50, Junior $1
Quarter Finals - Same as Local Elims.
Semi-Finals - $2.50 for all.

At all Central Area Elims, it will be necessary to have time limits for entry to keep people from waiting to see how times are running before they enter.

NOTE TO CENTRAL AREA FLYERS FROM KOWALSKI:

Since we did not know when the finals would be held, it was necessary to hold back with the announcement of plans for this coming year. No dates are set for the various meets as yet, but just as soon as the C.D.'s report in I will furnish INDOOR NEWS AND VIEWS with the dates, locations, and C.D.'s. The Semi-final must be held before June 15, so we will try to schedule the quarter finals for the middle of May and the local elims for mid-April. We will try to juggle the dates where possible to give you a chance to attend more than one meet in case you goof at your local meet. If there are any groups that want to hold their own local elims, let me know as soon as possible.

NOTE TO EAST COAST AND WEST COAST FAI FLYERS:

For further details for your respective areas, the man to contact is:

East Coast	West Coast
Richard Miller	Dave Copple
P.O.Box 27	823 S. Mariposa, Apt. #1
New York 23, New York	Los Angeles 5, Calif.

In view of the fact that the United States Indoor team will be under tremendous pressure from the foreign teams who made such a good showing in spite of a lack of practical experience in large hangars, the sooner we get to rolling the better our team will be. Careful planning now can do it!

****LATE NIMAS NEWS FLASHES****

Joe Bilgri has accepted the previously announced invitation to become a NIMAS Charter Member, and this completes the list of those invited to join.

AMA Headquarters has been notified of the formation of NIMAS, and Technical Director Frank Ehling has been asked to issue a special charter in the name of NIMAS.

Since the name "charter member" is on the way out, the names and addresses of the first seven members of NIMAS are listed below. If you require any further information about NIMAS, please contact us.

Volunteer help, plus application for NIMAS membership should be made through Bud Tenny. If there any artists in our midst, how about sending proposed decal designs to Dave Copple?

Dick Kowalski
20203 Moenart
Detroit 34, Michigan

Pete Sotich
3851 W. 62nd Place
Chicago 29, Illinois

Dave Copple
823 S. Mariposa, Apt.1
Los Angeles 5, Calif.

Bud Tenny
Box 545
Richardson, Texas

Chuck Tracy,
c/o CLEVELAND PRESS
Cleveland 14, Ohio

Richard Miller
P. O. Box 27
New York 23, New York

Joe Bilgri
256½ Locust
San Jose 10, Calif.

The most popular idea expressed by these charter members about their own membership has been, to quote Kowalski, "Members is members, no associate members, no leader members, no nothing. Just members, you pays the $3 and takes your chances." Needless to say, the so-called charter members are handling the work of running NIMAS until someone else will help out, but none of us claim any special privileges. The extra work is really just an extention of the same hole-in-head philosophy that results in our paying $6 for AMA licenses when we could get by for less.

NATIONAL RECORDS - PERFORMANCE YARDSTICK??

With the advent of low-and-medium-ceiling flying, and the resulting wide-open records picture, there was a rush to "set some new records". Within six months, all the more common indoor classes had good records on the books. At the end of nine months under the new rules, there were only a few records unclaimed by the more experienced flyers.

Already this sounds like a blast against the National Records as we presently have them, but - it ain't necessarily so! National Records are supposed to indicate a superior performance of man and machine, which they do. However, this does not tell the whole story for low ceiling flying. Medium ceiling records are a more valid measurement of performance, but even high ceiling records need not be taken as the final word.

Let's take indoor day at the '61 Nats as an example - top time in D was over 33 minutes at the time the D record was over 37 minutes. No one questions that Bilgri had the best official flight of the day, but he fell far short of the record time. In September, Joe took a similar ship with the same prop and rubber size and turned 38:41 for a new record on the first flight on that model.

If there is that much difference between different days and flying sites in Category III flying, how much more difference will there be in Category I & II? The point we hope to make is this: Don't be downhearted if you don't approach the existing record times on any given day in your own site.

Each existing record represents a superior combination of site, flying conditions, man and machine. It does not mean that the record holder could beat you in your own site. Unfortunately, this is a weakness of National Records that probably won't be overcome. Keep this in mind, and strive to do your best where you fly, and fly often!

****ANOTHER ANNOUNCEMENT****

INDOOR NEWS is becoming very well accepted under the announced subscription plan of $2 per year, and members of NIMAS are helping in this growth. We really appreciate this vote of confidence in our efforts to help indoor flying, and will continue to do our best to improve our coverage of news, rules and technical info.

We have been pleased also with the many letters of congratulations, all of which met with the same reply: "INDOOR NEWS is and will be what the readers make it. Good articles, fresh news, and well-thought out comments from all our correspondents will make the paper a real success". Since your editor lives in just one part of the country, he must rely on others for news from elsewhere.

With that in mind, we feel the need to turn the tables and say to all our friends who have gathered the news in the past, "Thanks for a job well done, keep up the good work."

The future holds much promise, with several articles on indoor topics planned by well-known indoor flyers. The first of these appears in this issue - the first part of a discussion on hand launched gliders by Richard Miller. Without doubt Richard is recognized as expert in this field, and we welcome his efforts.

Since the response to INDOOR NEWS has been so good, this December, 1961 issue will be considered to be the first issue under the subscription system. Those who have already subscribed will find a receipt included with this copy, indicating they are on the books. If we have missed anyone, we feel sure you will let us know promptly.

DRAFTSMAN WANTED

Want ads in the newsletter? Why not? This all comes about through special arrangements by Chuck Tracy to print plans and special sketches for inclusion in INDOOR NEWS.

Most plans aren't usable the way we get them, so NIMAS needs a volunteer draftsman, (or draftsmen, to keep from overworking anyone) who would be willing to put plans in shape for publication. How about it?

The amount of work involved varies from tracing a set of plans in ink, to re-arranging a set of plans or redrawing them to proper size. If we can come up with more than one helper, this may spread out the load so everyone can concentrate on building and flying!

SAVE THOSE PAPER STICK MODELS!!!

Yes, those old-rule paper stick models are still good for a while, on two counts! First, the new rules that were supposed to go into effect haven't been fully accepted, for several reasons.

Second, these models are still OK for one of the biggest and best indoor meets going! We refer to Chuck Tracy's Great Lakes Indoor Air Meet, held January 11 at Cleveland's Public Hall, in Cleveland, Ohio.

The meet features four age classes for Juniors and then Senior and Open events besides. Model types to be flown are: Glider - all ages, Pre-Fab - all ages, Paper Stick - Bantam, Fledgling, Jr., Sr., Op., Microfilm - Jr., Sr., Op.

The fascinating array of Junior age classes breaks down this way: Dodo - 9 or younger, Bantam - 10 & 11, Fledgling - 12 & 13, Junior - 14 & 15. It is good to see a contest which thinks so much of future modelling that the prizes put the emphasis on the youngsters to this extent.

From all reports, this meet is so well attended that your name should be on your gliders, to be sure of getting them back. And all test flying must be done in another building across the street, in order to leave air space for official flights! This one sounds like a real ball, so plan to go! For further details, write: Chuck Tracy, c/o CLEVELAND PRESS, Cleveland 14, Ohio.

****SOLID STICKS OR HOLLOW?****

The Chicago Aeronauts Paper Stick proposal has met with considerable opposition since it was finally published in several newsletters and in MODEL AVIATION. Some reactions have been so violent that letters from these individuals were almost hot to the touch. Other model builders and leaders feel that the proposal did not receive proper consideration, since it was not published in MODEL AVIATION during the study period, and more calmly insist it be recalled for further study.

Since the Chairman of the FF Contest Board has not reported on the status of this proposal at this date, we can only go on reports from other sources. Several CB members have asked for recall, and at least one did not support his original affirmative vote. If you have a special reaction to this proposal, be it violent or passive, make your feelings known to the Contest Board member for your AMA District. Elsewhere in this issue there is a list of CB members, keep it for reference.

****MORE ON GLIDER PROPOSALS****

Since the November issue of INDOOR NEWS, which gave the text of three proposed indoor HLG proposals, an announcement of a fourth proposal was made. Careful study of the "four" proposals showed that the extra proposal really was a letter in support of one of the other proposals. Further study showed that the proposal by the Cliff Model Club was not included, but instead a copy of Ken Dougan's letter supporting the proposal!

To keep abreast of further developments on these already delayed proposals, check with your local CB member and let him know you care! Watch for these to be published in MODEL AVIATION, if you missed the text as published here. If sufficient interest arises, that portion of the November issue could be reprinted for 25¢ a copy and be sent out. Further, the latest information on the FF Contest Board is published below for reference. Remember, some of these members are up for re-election, so this list may change.

Dist. I - Daniel Sobola, 94 Rock Hill Rd., Hadley, Mass.
Dist. II - Bob Hatschek, 316 Grosvenor St., Douglastown, Maryland
Dist. III - Rudy C. Kluiber, Sr., 14324 Lakewood Hts., Cleveland 7, Ohio
Dist. IV - John Patton, Chairman
Route #5, Fredrick, Maryland
Dist. V - Harold Thompson, 5311 S. W. 104th. Avenue, Miami, Florida
Dist. VI - Gerald Ritz, 9520 Greenwood, Des Palines, Illinois
Dist. VII - Cecil Winters, 1406 May St., Lansing 6, Michigan
Dist. VIII - Ken Dougan, 702 Huddleston Dr., Grand Prairie, Texas
Dist. IX - George Batiuk, 3066 S. Osceola St., Denver 19, Colorado
Dist. X - Bob Hunter, 7447 Satsuma, Sun Valley, Calif.
Dist. XI - James Cole, 4125 Austin, Seattle, Wash.

QUESTIONS AND ANSWERS

By request, and also because we think it a good idea, we are starting this particular column to serve as a clearing-house for those unanswered questions that plague even well-informed and competent builders.

Within limits, the scope of the column is to be no-holds-barred - theory, technique, or whatever. Try to be sure your questions are clear, and not ambiguous. When possible, the questions will be fielded ahead of time by an appropriate expert so the question and the answer can appear together. Other questions will be thrown out for general comment like these below. Keep the answers as short as possible without obscuring the meaning.

1. Is there an accepted relationship of prop area to wing area as there are accepted stab and rudder areas?

2. Should a lifting tail have a positive angle of incidence with relation to the thrust line? What is the best arrangement?

3. What is the best relationships between fuselage and boom length, and between wing span and total fuselage length?

****AMA ELECTIONS****

By the time this reaches you, the time will be a little short to send in your AMA Ballot, but it's worth the effort to do so. If Christmas has you strapped for cash, the license renewal has a longer deadline than the ballot, so vote anyway. Because there are personal friends on both sides of the fence in so many of the races, we will refrain from supporting any candidate.

However, there are a couple of points which can be made, and here they are. If you haven't been satisfied with the way AMA has been perking lately, the election is your only easy chance to change things. To really be sure of accomplishing anything by your vote, you need to know the candidates and what they stand for. If you aren't personally acquainted with a candidate, there is little chance to find out what you need to know. Recently we heard the idea advanced that brief comments on candidate qualifications be published before elections.

This is a fine idea, and if you like it, now's the time to start on next year's elections. The logical place to get these comments would be from the man who makes candidate suggestions to the members of the nominating committee. It will take agitation, and that is lots of work, but it can be done. If we start now, the proper people can be nominated and the supporting info be gathered for publication. But, enough people will have to want it, or it won't go. If you get writer's cramp or your typewriter stutters, forget it. Things like this take lots of writing, first to gain support for the idea, and then to convince AMA the support is there.

NEWS FROM AROUND THE COUNTRY

ILLINOIS - CHICAGO

In Chicago, flying at the Madison Street Armory started November 4, as announced in the last issue. Pete Sotich reports the flying schedule to be: 1st, 3rd., & 5th. Saturdays - HLG - 9:00 to 11:30 AM, Paper Stick - 11:30 to 12:30, and Microfilm Rubber - 12:30 to 4 PM. On the 2nd. & 4th. Saturdays - Paper Stick - 9:00 to 10:00 AM, Microfilm Rubber - 10:00 AM to 1:30 PM, and HLG 1:30 to 4:00 PM.

Pete goes on to comment: "With this type schedule it will not be necessary for modelers to spend the whole day at the Armory. Various schedules have been tried out and the present schedule seems to work best.

Bob DeBatty made a flight of 26:13.0 with a FAI Indoor model and he appears to be going all out in his preparation for the next FAI Indoor Eliminations."

For those not familiar with the location of these flying sessions, the Madison Street Armory is located at 2653 West Madison Street. For visitors and flyers alike, it is requested that you don't smoke on the Armory floor.

One of the most faithful attenders at the Armory sessions has been Don Kintzele, who has a 200 mile trip every time he shows up! In fact, Don missed only two sessions last year, one was Christmas Eve and the other was a Detroit indoor contest.

TEXAS-FT. WORTH & DALLAS

The Cliff Model Club plans an indoor contest for January 7, but at the time of this writing sanction had not been applied for. Presumably it will be at the Drill Hall at Dallas N.A.S., will have at least Stick and HLG events.

Sanction has been applied for to hold a Category I Record Trials at the Walnut Hill Recreation Center on January 14, and there was an indoor flying session there on December 3.

TEXAS - LUBBOCK

Riley Wooten, combat pro, confirmed our suspicion that indoor was dead in Lubbock. He reported that a few fellows had flown there about three years ago, but nothing since.

We have heard that there are two - not one, but two coliseums in Lubbock, so it looks as if there is a golden opportunity going to waste. Anyone interested?

WASHINGTON - SEATTLE

Last month Richard Love, District XI AMA V.P. answered our query about indoor flying in Seattle. He has served as CD for some Category I Record Trials, and describes the activity as follows:

"Our group has been flying periodically for about a year and a half now. As in most model activities these days, the membership is largely over 21 with a few seniors and a couple of juniors.

We fly in a West Seattle fieldhouse gym - Hiawatha Field House. The ceiling height is just under 25' - length and width are 98½' x 57½'. The ceiling is pretty clear although louvered ventilators protrude slightly from the ceiling. We can fly there only on Saturdays from 3:30 - 6:00 PM - approximately once a month so flying time must be rationed."

Mr. Love also went on to report that his group had set two national records in this site, which helps to sell their need for the building. The two records he mentioned were Hu Entrop's A ROG (12:10.0) and Phil Hainer's B Stick (8:54.4) which were both set in April of this year.

If you didn't pay attention to the building size, go back and read it again. Both those records are good times, and they were done in a building with limited floor space and ceiling height. If you have a similar site, and only average times, try harder! It's possible!

MISSOURI - INDEPENDENCE

From Dick Black came a letter and a copy of his newsletter "Slipstream", a very well edited and informative paper. Dick's club, the Propbusters, has the usual problems with sites, and have been going all the way to Topeka, Kansas to hold record trials in a school gym there. At least the site is free, and has nearly 35' of ceiling.

The October Record Trials resulted in a record application for the team of Stamm & Johnson in B Stick, with a flight of 10:21.0, and the same Johnson applied in HLG with a time of 0:41.2. Stan Chilton from Wichita made several assults on the A ROG record, but kept hanging up.

The November Record Trials gave Dave Erbach three record applications for the Junior age group; 6:14.8 in B Stick, 4:33.3 in B Cabin, and 4:14.8 in A ROG. It seems as if the boys in that area think nothing of trips well over 100 miles to fly indoor!

That copy of "Slipstream" finished with plans to the Stamm-Johnson record model, a conventional B Paper Stick weighing .068 oz. and flown for the B Stick record. Who said they have to be light for Category I?

VIRGINIA - YORKTOWN

Bob Champine reports that members of the Brain-Busters club have been trying to get permission to fly in a blimp hangar at Weeksville, North Carolina. So far, there has been little success, but they will keep trying. The hangar appears to be at least as large as the one we flew in at the Nats, so it's worth the try.

In a more optimistic vein, Bob reports on efforts to schedule flying sessions in the Newport News Armory for December.

Aside from looking for sites, Bob's latest project is a special double-surfaced FAI prop which is waiting for a place to fly to turn up.

CALIFORNIA-WILMINGTON

WIMAC NEWS (Dave Copple) reports that the December session at Wilhall will add indoor flying scale for the first time on December 8, starting at 7:00 PM.

The November session was enlivened by Anne Gitlow, (Lew's new bride) as she placed 1st. in Novice Easy B with 5:13.

INDIANA-KOKOMO

Word has been received that the Kokomo Knights of The Round Circle has the use of facilities at Bunker Hill Air Force Base for indoor flying, a Category I Site. Let's hear from you, Kokomo!

THE HAND LAUNCH GLIDER

PART ONE

By RICHARD MILLER

Introduction

It has been my ambition for some time now to write a book on the hand launch glider. Despite the fact that I had someone willing to publish such a book, the matter of finding enough time always proved a problem.

Recently it occurred to me that perhaps a good way to get the book done would be in small installments in INDOOR NEWS AND VIEWS. I queried Bud Tenny and found him willing to co-operate. As a consequence, portions of from 750-1000 words will appear in each issue; and if you string them all together they will probably reach at least to 1963 or 1964.

Writing a book at the average rate of twenty words a day is bound to take time, a disadvantage offset by two splendid advantages. One is the fact that each month something gets done. The other is that if you, the readers, co-operate by commenting on the segments you read each month I will have the sort of material which (when the time comes to put all the bits and pieces together) will make for a comprehensive and, as they say, a "definitive" work.

So please, when reading some fragment about which you are well-informed and experienced, jot down your observations and send them to me, Richard Miller, Box 27, New York 23, New York.

History

It seems probable that the first man ever to launch a glider by hand was a remarkable Englishman named Sir George Cayley (1773-1857). Cayley, whose accomplishments in aeronautics are out of proportion to his small renown, is believed to be the first man to understand the contribution of dihedral to stability and the fact that the center of pressure of the wing falls over the center of gravity of the aircraft in normal flight.

CAYLEY - 1804

In his late teens Cayley had built very successful helicopters of feathers, cork and whalebone; and in 1804 (aged 31) the fundamental glider. It seems from the shape of the wing (see illustration) to have been developed from a kite, a fact which seems fitting. Beyond this it had a generous tail moment arm, modest surfaces and the look of a model that should fly.

About 130 years later as time flies we find the hand launch glider, as we recognize it, beginning to evolve in the United States. Why the simple chuck glider underwent such an extended period of latency, why it did not develop earlier (ahead of that crazy twin pusher, for example) is anyone's guess.

It is possible that insomuch as man had real gliders (Lillienthal, Chanute & co.) there was less fascination in the models. Another possible cause for the lag is that the HLG had to come further from its full scale counterpart, had to undergo a greater metamorphosis than the rubber model did.

So? So in the October 1930 issue of M. A. N. we find something called the "Hawk Soaring Glider". It has a deep and heavy fuselage, "V" dihedral (24" span) and an outsize rudder that makes it quite ugly by present day standards. Nonetheless it was a direct ancestor of today's HLG.

How were times, always an index of progress, in those days? Well, looking now in the July '32 issue, (still M.A.N.) we find the results of the Eastern States Meet of that year. August Ruggeri, 16 years young at that time (where are you now, August?) did :15.8. In second place was another youngster named Johnny Zaic (I know where you are, John!) with :12.0 flat.

Wanna know who placed third? Wanna know who first made a minute indoors? Then pay your $2 and get the next exiting issue of INDOOR NEWS AND VIEWS.

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." JANUARY 1962

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

Last month the NIMAS column carried the story of the formation, aims, and other details of our special organization. This month we have a more detailed account of the most important facet of NIMAS - the ballot by which official policy is determined.

Since a few questions have come up in regard to NIMAS membership and the use of the ballot, these comments should clear up some of the points in doubt.

INDOOR NEWS AND VIEWS is available without NIMAS membership, if desired, but NIMAS membership without the newsletter will not be feasible.

The newsletter must be a part of the membership so the exact wording of any proposal is clear at the time the ballot is used. All items of official NIMAS business will require the careful and individual attention of each member for the vote to have meaning.

Please note - non-members who subscribe may use the ballot to express their opinion, and these opinions will be made known. However, each time a ballot is issued the effect will be a roll call vote, and ballots not returned will be considered to be affirmative, if this is applicable. NIMAS policy on any given matter will then be determined by the outcome of the official balloting.

In order to keep the voting truly representative of all indoor flyers, members of a club should cast individual votes rather than a group vote. If this is not done, a group decision by several individuals can be nullified by the first opposing vote cast by some other member.

To summarize, ballots are to be filled out and returned to Box 545, Richardson, Texas as soon as you can possibly reach a decision. Ballots issued to NIMAS members and not returned will be counted as a vote of "yes", unless a stated choice of several alternatives is offered. Non-members can have their vote counted by joining NIMAS when they return the ballot, otherwise the ballot will be counted as an opinion only.

The latest word from Pete Sotich is that AMA HQ is fully in favor of our group and others like it, and that a special charter will be issued when one is made up. This may take time, however, so let us hear from NIMAS members. Drop us a postcard and tell us if you would prefer to wait for the special charter, or if we should apply for a regular club charter until the special charter is ready. Send the postcards to Bud Tenny, Box 545, Richardson, Texas.

There are still plenty of NIMAS memberships available, so step right up and get the biggest bargain open to bona fide indoor flyers - only $3 per year. A subscription to INDOOR NEWS is included, and you can help guide the future of indoor modelling!

****FAI INDOOR REPORT****

About 48 hours too late to stop the presses, word came from Chairman Joe Bilgri that some changes had been made in the previously announced FAI Indoor Elims procedure, and details came from Dick Kowalski later in the month. Slight changes were made in the set-up of all three elims as follows:

Local elims - Three flights using AMA rules, best time wins, three models permitted.

Quarter finals - Instead of six qualifiers permitted at Chicago, eight will be qualified.

Semi-finals - Flights where models collide with another may be re-flown.

****LATE WORD ON SOLID STICKS****

Rudy Kluiber, District III FF CB member, reports that the Solid Stick Proposal has been recalled and that the 1961 Paper Stick rules will apply again in 1962.

Really, we are kinda sorry to see that happen. Our mail was entertainingly enlivened by many well-written comments about that subject. If NIMAS members will put one-tenth the effort behind our program as was expended on the Paper Stick proposal, NIMAS will be a howling success.

****FUN MODELS****

For over a year, the WIMAC bunch have been flying "formula models", the Easy B class. Basically, these are "quickies", enabling novices to learn more and busy pro's to keep their hand in. These models fit in well with Dunwoody's remarks about a beginner class.(INDOOR NEWS - October '61) They might well be a logical replacement for the Paper Stick proposal, and seem to fit in well with the Chicago Aeronuts' original intent.

Briefly, the "formula" is this: 18" span, 3"chord, all-balsa prop, solid stick and boom, and no bracing permitted. In order to simplify processing, a similar no-holds-barred event is being tried in the Ft. Worth-Dallas area, the results will be reported as soon as they are available.

****ANOTHER GLIDER PROPOSAL****

Recently, Tem Johnson sent us a carbon of another indoor hand launch glider proposal which has been sent to John Patton for distribution to the FF Contest Board for preliminary approval. This makes a total of four such proposals before the board, which should make an interesting situation for a while until they all get sorted out. Mr. Johnson's proposal contains four parts as follows:

1. Delete the second sentence in paragraph 13.1.
2. Delete paragraph 13.2 and substitute the following: Minimum Surface Loading. An indoor hand launched glider must weigh at least 0.002 ounces for each square inch of supporting surface area. Supporting surface area enclosed in a fuselage shall not be considered.
3. Delete paragraph 13.3.
4. Delete the words "released or" in the first sentence of paragraph 13.4.

Quite possibly the time will be right for NIMAS action by the time for the February issue. If so, all these proposals will be summarized and a ballot issued with the February issue. The results of this ballot will then be made known to the Contest Board for their consideration.

"NICE PEOPLE"

For years we have been aware that model builders were some of the nicest people we know, which isn't necessarily a biased viewpoint. If there had been any doubt of this, our Christmas weekend experiences would have removed all uncertainty.

On a trip to visit relatives, we stopped to visit on both legs of the journey. In Fayetteville, Arkansas Dick Ganslen and family rolled out the welcome mat and made us feel at home immediately.

Dick, who is an old-time rubber and glider man, and an avid indoor flyer besides, has an additional bit of welcome for visiting indoor flyers. He usually manages to get into the fieldhouse of the University of Arkansas for an indoor session. This time was no exception, and we got to limber up our models for over three hours. This was our first chance at Category II flying for over six months, and enabled us to check out this season's models more thoroughly.

On the return trip, Bill Netzeband put us up at his home in Tulsa, and again the welcome mat was out. Bill is past president of the Tulsa Glue Dobbers, and made it possible for us to meet Dave Carter of the FF section. Dave is interested in indoor and plans to cajole the Dobbers into flying a little indoor. Our bull session lasted into the wee hours, and left us haorse from talking.

Of course, the hospitality is always wonderful at times like this, but the real treat is the opportunity for more bull sessions. Without these bull sessions, our hobby would soon be characterized by its lack of change and challenge. Bull sessions provide direct stimulation for all participants, and many new ideas are triggered in this way. Often, the result is a new model class or a new record for others to shoot at.

Consequently, we take this opportunity to thank our recent hosts again for the opportunity to "recharge our mental batteries"; truly, they are nice people.

DRAFTSMAN STILL WANTED

Last month we issued a plea for volunteer draftsmen to help prepare plans for publication. Just before this issue went to press, one man stepped forward and offered to help. He is welcome, but we will need more volunteers so no one will be overloaded. Volunteer work is one thing - let's not make a slave out of this man!

The amount of work involved varies from tracing a set of plans in ink, to re-arranging a set of plans or redrawing them to proper size.

****GETTING STARTED****

We have received mail which asks the question, "How do I get started in indoor?", or, "How can I get regular indoor sessions started in my area?". Far be it from us to assume we know enough to answer such questions completely, but we hope to point out a general direction and cheer you on.

We read with delight an account of how one group solved their problem a very good program. The group: The Union Model Airplane Club of Union, New Jersey; the problem: develop indoor activity to bridge over the winter months of cold weather and low activity.

This group was fortunate enough to be able to start with an impressive list of old-timers such as C. V. Russo, John Triolo, Ernest Kopecky, Julius Rudy, Emanuel Radoff, Dave Call, Bill Bigge, and Pete Andrews. With that list of indoor buffs, one might be tempted to ask, "Who needs an indoor program?" However, these fellows realized that their total experience wouldn't help the average builder one iota unless a carefully developed program was set up to help him start right and develop to his maximum potential.

What kind of program did they come up with? To start, an auditorium was obtained for their meetings, and R.O.G. models built "stock" from kits were flown at the first meeting. The club furnished identical loops of rubber for each flyer, and then helped them to adjust and fly the models.

As a follow-up to this program, the next meeting went into how the kit models could be "souped up" to increase performance, followed by a contest to test the newly-acquired skills. The next meeting will combine a Category I record trials with discussion and demonstration of advanced building techniques. Final meetings will round out the program with special awards for neatness, originality, and [illegible] time, plus a contest for all classes of indoor models.

Before someone complains that they don't have all that talent, bear in mind that similar programs will work even if everyone starts at similar skill levels, but it will take longer to reach the top. The basic principle is to start with simple models and gradually work up to lighter models until microfilm models are mastered. Then practice will make the difference, the more practice the better.

Unfortunately we know of very little printed material which deals with indoor techniques, However, there is a booklet entitled "Indoor Sketchbook" sold by Lew Gitlow, 2763 Roseview Ave., Los Angeles 65, California which puts more basic indoor information under one cover than we've seen any other place. After all, indoor models are simple until you get fussy over the weight, all the rest is practice. Send Lew $1 and ask him for a sketchbook - every group should have one.

The basic necessities for starting an indoor group are: a place to meet and fly regularly and often, and a group of people interested in indoor flying. All the rest are luxuries, to be acquired as the group grows and has need of them. Further, the flying site need not be higher than 12'-15', but the ceiling should be reasonably smooth and the floor space should be at least 20' x 30' or more if possible.

Higher sites (over 30') unless they are perfectly smooth, can present more problems than advantages until the flyers learn to control the climb so hang-ups can be avoided. Nothing can discourage a novice so much as to hang a model and demolish it while retrieving! Besides, the larger sites are harder to get, especially until the group proves they have outgrown the smaller site.

Personally, we wouldn't recommend any microfilm projects for a while unless an experienced indoor man is around to give help. Simple paper covered models are much better to start with, and will polish all aspects of indoor building except for the techniques of microfilm models.

Keep the size of the models down to about 18"span so they will work in your smaller site, and concentrate on learning building and flying. Most important - fly regularly and often. This improves technique more than any other single thing.- no matter what kind of models you fly.

One final point, and that is where to buy indoor supplies? If there is no indoor activity near, you will have to mail order supplies from one of two sources:

Jem Supplies	Micro-Dyne Precision Prod.
2979 Dudley	P. O. Box 65774
Lincoln, Nebraska	Los Angeles 65, California

****LATE FLASH****

PETE SOTICH HAS BEEN REELECTED AS PRESIDENT OF AMA! We wish Pete the best of everything as he again assumes one of the most important and thankless jobs we know of.

QUESTIONS AND ANSWERS

Last month, at the initiation of this column, we indicated that some questions would be thrown out for general comment, while others would be sent to some person generally accepted as expert for his comment. To aid in keeping the questions straight without repeating them, each question will be referred to by the number assigned here in the column.

Bill Bigge responded to the December column by answering questions #1 and #3 as follows:

1. "It is news to me that there are accepted stab and rudder areas. My rule-of-thumb is: Stab area x moment arm = wing area x average wing chord. Rudder diameter = 1/4 prop diameter. Sounds like a lot - it is a lot. - but the thing always climbs well under high power. The propellor diameter should be as much as the model will take and fly well up to 60% of the wingspan. Use a popular blade width or aspect ratio. Pitch/diameter ratio should be 1.7 or more unless it flares."

3. "There is no relation between fuselage length and wing span. (see preceding paragraph) The relation between the motor stick and boom is a matter of emphasis. A short stick cuts weight but tends to let the C.G. move too far back. Likewise, the wing aspect ratio is a compromise between weight, drag, and torque control. If you are a lot better at building wings than fuselages, use long wings and short fuselages. Note that similar models of the same wing loading should have the same duration and use motors of the same length."

Bill was one of three persons asked the following questions for comment here:

4. "Dave Call always stresses efficiency and Bill Bigge sent me a formula showing a gain (in efficiency) will result in twice the time gain as if weight were saved." (Quoting from the original source of question)

5. At this point your editor injected a question - How about a discussion of efficiency of indoor models?

6. What is the best prop shape? Records and phenomenal times have been done as of late with both teardrop and straight shape props.

7. Why do we fly with torque? Why not fly against torque?

8. What is the best way to control torque? Wash-in? Offset? Extra area? Prop offset?

Bill responded, answering the one on efficiency first:

Let v = the sinking speed of model gliding, with motor and prop replaced with ballast, in feet/second, and:
V = energy potential of rubber, foot pounds/pound
T = duration in seconds
W_r = weight of rubber
W_s = weight of structure
d = air density
A = area of lifting surface
C_d = coefficient of drag
C_l = coefficient of lift
θ = gliding angle
E = efficiency, so called
Then $T = V/v \times W_r/(W_r + W_s) \times E$

and $v = \sqrt{2(W_s + W_r)/dA} \times C_d/(C_l)3/2 \times (\cos \theta)3/2$

Putting in some approximate values, let T = 2000 seconds, V = 2400 ft. lbs./lb., $W_r/(W_s + W_r) = 0.5$, and v = 0.3 feet/second. Then E = 0.5. That is, the product of what may be called energy storage efficiency, propeller efficiency, and flight pattern efficiency is 1/2. Maybe the value chosen for V is too large - the other figures are reasonable, and E looks almost too good.

On question #4 Bill comments, with relation to the formulas already given:

A 1% increase in efficiency will increase duration by 1%. A decrease in W_s of 1% with no change in W_r, will decrease $(W_r + W_s)$ by $W_s/(W_r + W_s)$%. Because of the square root, this decrease in weight will decrease v by $\frac{1}{2}W_s/(W_r + W_s)$%, that is, by 3/4% or less if W_s is equal to or less than W_r, as it should be. The model should fly ½% higher and farther and ¼% slower. If W_s and W_r are each reduced 1%, usually a more realistic condition, (and convenient - Ed) the altitude reached is unchanged and the duration is increased ½%. Thus the remark that efficiency is twice as important as weight. The ratio of induced drag to total drag, ignored here, could also be called efficiency and is equally important.

On Questions #6, #7, and #8, Bill comments:

The best prop shape is the one that the individual can use for his purpose with best results. A well - balanced, properly flaring prop of any reasonable form is better than a poorly engineered prop of the best form. In other words, I plead ignorance.

The initial choice is between one spar and two spars. I have a suspicion that both the best props and the worst props are monospars. A greater variety of blade shapes is feasible with monospars. On theoretical grounds I lean toward having area concentrated near the mean radius but would not be surprized if the taper toward the tip should be concave instead of convex, at least part of the way. A possible advantage is that spar stiffness toward the tip could be reduced. In practice, structural considerations may be controlling.

I fly with torque because when my 1956 "C" flew against torque the circle opened on high power. If the rudder is adequate a model will turn more readily with torque. To fly against torque requires more extreme adjustments, which tend to reduce efficiency.

Torque is controlled by extra area and wash-in. I don't know what offset is unless it is extra area or swinging the left wingtip forward. Slewing the entire wing, as mentioned, building the wing with dihedral ribs rotated clockwise as viewed from above, and left thrust (offset?) are all essentially methods of getting extra wash-in on the left tip relative to the right. Extra area may be the most efficient control means in steady flight. Wash-in gives the model a better chance to recover from improper flight attitudes at high power. It also tends to make the model dive straight ahead when falling off a girder, and gives it a better chance to clear the next time around.

NEWS FROM AROUND THE COUNTRY

CALIFORNIA-WILMINGTON

Dave Copple reports that the December session at Wilhall had a large turn-out for the contest-record trials. The Easy B class seems to be turning out lots of new people for their sessions.

On the following weekend, these boys flew at the Los Angeles Armory, Easy B's again. Over twenty entries in Expert category. Tom Finch topped the crowd in the 44' ceiling, turning 10:30.

CALIFORNIA-BAKERSFIELD

From Herman Stubblefield in Bakersfield we hear that several fellows in the Bakersfield club are flying miniature gliders in their meeting hall, and plan to give rubber ships a try if they can find a site.

INDIANA-KOKOMO

During the last month we heard from Chuck Borneman of the Kokomo Knights of The Round Table, who sent a letter and copies of the club newsletter. Anyone in that area interested in indoor flying should contact Chuck at 1401 West Taylor, Kokomo.

This club, once exclusively a control line club, has now branched out into free flight events and also indoor events. Their flying site at Bunker Hill AFB is at the low end of Category II with about 45' ceiling.

The HLG boys are working toward the 0:40 mark, the club record is 0:34.6 and there was an unofficial mark of 0:39.0. One of the club juniors jumped up with a mike ship which has turned a high of 7:54.

Two of the more active indoor flyers at each event are members of the BHAFB Model Club, and are responsible for the site availability. They are Captain J W. Hardin and CWO Herb Summers.

ILLINOIS-CHICAGO

Times in the weekly Madison Street Armory sessions (75' ceiling) have been climbing, as a result of lots practice flying, Pete Sotich reports. Tom Neumann, 18, has worked a modified Sweepette up to 1:08.6, while his brother Dan, 14, followed close with 1:02.6.

FAI times have been climbing past the times from the elims last year. Bob DeBatty recently topped out at 26:23.0, Charlie Sotich turned 22:00+, and Don Kintzele 20:00*

MISSOURI-KANSAS CITY

Tem Johnson comments on his record-holding joint effort with Dick Stamm, "The why of the relatively heavy paper covered ship is that paper covering can take hang-ups without losing its skin. Around here there's not much percentage in trying to build exceptionally light planes for the same reason as paper covering and also because the air is usually quite turbulent. Heavy ships ride right through bumps that stall light ones. Of course, as we gain skill and fly closer to a plane's performance limit, lightness will count."

MISSOURI-ST. LOUIS

Ed Veselsky reports that indoor flying in St. Louis is starting up again after being dormant for 8 or 10 years. Members of the Kirkwood Thermaleers have been putting on flying demonstrations for Boy Scout troops and similar groups, and they feel there is a possibility of getting back into the site of Carl Goldberg's famous 23 minute flight of years ago.

WASHINGTON-SEATTLE

Phil Hainer suggests method for test flying Cat. I ships for maximum potential - fly them G-line on .001 wire. He sez both he and Hu Entrop have broken 13:00 with Class A ROG's in their living room!

THE HAND LAUNCH GLIDER

PART TWO by RICHARD MILLER

HISTORY (cont.)

In the life of every model type, as in the life of most cultures, there is a Golden Age. This is the time near the beginning, the time of development, of trial and error when the essential form related to the specific function evolves. This period is to the later history of the model what the frontier is to the settled community. It is in general a more exiting time than what comes later. It is likely to be remembered with nostalgia by those who lived through it; they are likely to be a bit scornful of the lack of originality of the newcomers and the "set" designs they fly without realizing that each generation faces whatever challenges are open to it as best it can and leaves, in turn, its own Golden Age.

In most model types this period of development seems to take from 5 to 10 years. During it the lasting characteristics are evolved; beyond that there are inevitable changes and refinements but very little basic change. For the modern rubber model this period seems to have been the thirties. For U-Control and the single-channel RC model it was the time just following the war. For the hand launch glider, which coincides closely in this respect with the gas model, the early thirties was the time of getting ready while the real development took place in the late thirties and, after the interruption of the war, to a lesser extent in the late forties.

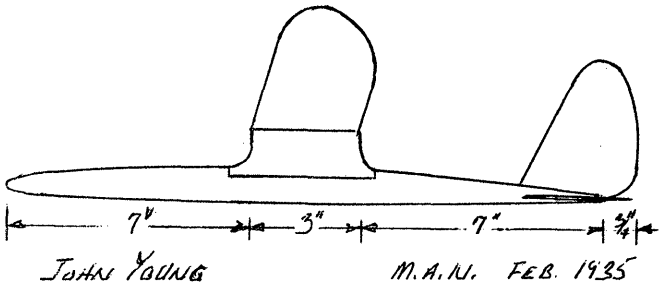
Nevertheless, by as early as 1933 HLG activity was widespread and important enough to warrant rules governing them. In April of that year - possibly in contemplation of the coming Nationals - the NAA established three classes: "A" (up to 30 sq. in.); "B" (30-65 sq. in.) and "C" (65-125 sq. in.) By September of the same year we find the first official record for HLG. Senior John Romanski did 28.4 seconds.

The first HLG plan I came across in researching back issues of M. A. N. appears in an article by Carl Goldberg entitled "Keeping Pace With Model Science". Date: October '33. The design is by John Young (no dimensions given) which features a pylon (popular in those days), sweptback wings, ordinary dihedral and a huge rudder. The model's best flight was 1 hour and 7 minutes o.o.s. from New York's Van Courtland Park.

The first bona fide HLG article, "How To Build a Simple Glider" by Marion Thomas of Topeka, Kansas comes along in April of 1934. Although the span of this one is a scant 11-1/4 inches one feature is outstanding; it has Nordic type polyhedral. Mr. Thomas informs us that the dead air time (on which there will be a few cynical comments later, like in May of '63) of this up-to-date machine is 17-18 seconds and that with all the forces of God and man in conjunction it hits as high as 21 seconds. Add about a minute to that and you have the struggle of the early sixties.

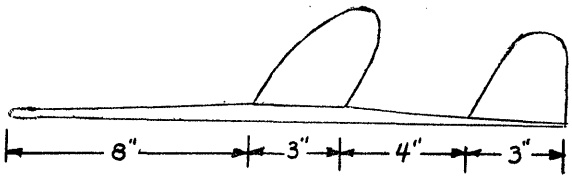
In the October '34 issue I came across the first two records which were specified as being "indoor". These were both by a senior, David Hecht of NYC. One was a class A record of 34.4 seconds, the other a Class B record of 31.6 seconds. The same list, incidentally, carries Goldberg's indoor tractor time of 22:59.4.

By February of 1935 the IHLG has come adequately of age to warrant its own honest-to-goodness plan and article in M. A. N. The design is by John Young and a lot like his earlier hour and 7-min. machine in the Goldberg article. The span is 19-1/2" and the chord 3" with 3-1/2" under each tip and a little sweepback. Things we might find a little odd looking today are the 1-1/2" pylon on which the wing sets and the fact that 7" of the 17-3/4" fuselage is ahead of the wing leading edge. Of possibly even greater interest (at any time) is the fact that the 1/8" sheet wing, as well as the tail surfaces, have a symmetrical section!



The total weight of the glider is .6 oz. The builder got his turn, as was common in those days, by a combination of wash-in in the right panel and left rudder. The model featured no finger grip (I guess you grasped the pylon) and I wonder who would like to state unequivocably that he could do 43 seconds indoors with such a machine today?

Or 52 seconds with the "World Record Indoor Hand Launch Glider" presented in the April 1937 M. A. N. by Tex Rickard of San Antonio, Texas? This Class B mach- is a lot like Young's and with its 8" nose gap and 4" tail gap are just about opposite of what we have today. (Incidentally I was unable to find either of the times claimed for these gliders in the official records which I saw - but I didn't see them all.)



During the years just before the Second World War - after the ground work done in New York and Texas - IHLG design and development fell into the hands of Chicagoans in general and of the Chicago Aeronauts in particular. That club dominates IHLG records, and a good deal of indoor activity as well, during this time and the names which appear most frequently are those of Goldberg, Simmers, Obarski, Hugelot and Matulis.

If there was a Golden Age of IHLG this pre-war period in the old Madison Street Armory was surely it. The records recorded below (from Zaic's Model Aeronautic Encyclopedia vol. 2) were effective as of March 1st, 1938 and indicate the degree of refinement in building and flying which had been achieved by then:

	Class "A"		
Jr;	Milton Hugelot	Chi, Ill.	44.5s
Sr;	Wallace Simmers	Chi, Ill.	49.3s
Sr;	Carl Goldberg	Chi, Ill.	47.5s
	Class "B"		
Jr;	Robert Gelbard	Chi; Ill.	49.2s
Sr;	Wallace Simmers	Chi; Ill.	58.4s
Op;	Carl Goldberg	Chi; Ill.	47.5s

It could be that, having broken many a fuselage on many a Saturday morning in that armory myself that I'm a little prejudiced - but those sure seem like the good old days to me.

-30-

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." FEBRUARY 1962

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

It was hoped that our first official NIMAS ballot could be distributed with this issue, but Rudy Kluiber reminded us that there are four new CB members, and the new chairman had not been appointed. So there will be no rush for an official position until next month.

In response to several requests, we agreed to print the names and addresses of NIMAS members so we all can get acquainted as the opportunity arises. As of January 31, 1962 this is the official membership list:

JIM ANDREWS, 2323 S. Lancaster, Dallas, Texas
DENNIS ARONSON, 1804 N. San Antonio Ave, Pomona, Calif.
JOE BILGRI, 256½ Locust Street, San Jose, California
RICHARD BLACK, 3214 Ash, Independence, Missouri
CHUCK BORNEMAN, 1401 W. Taylor Street, Kokomo, Indiana
HARDY BRODERMAN, 4729 Walnut Lake Rd., Birmingham, Mich.
STAN CHILTON, 446 Ida, Wichita, Kansas
DAVE COPPLE, 823 S. Mariposa, Apt.#1, Los Angeles 5, Calif.
RICHY EARLE, 522 Pittman, Richardson, Texas
HUBERT ENTROP, 6751 22nd St., N.W., Seattle 7, Washington
EDGAR FRANKLIN, 226 Harrington St., Bergenfield, N. J.
LEW GITLOW, 2673 Roseview Avenue, Los Angeles 5, Calif.
JIM GRANT, 70 Craigs Road, Windsor, Connecticut
PHILLIP HAINER, 10412 S. E. 228th St. Kent, Washington
EUGENE HANSEN, 26128 Hopkins, Inkster, Michigan
RAY HARLAN, 71 Brighton Avenue, Allston 34, Mass.
JAKE JAEGER, 2812 Purdue Road, Kettering 20, Ohio
CURTIS JANKE, 1612 South 7th St., Sheboygan, Wisconsin
HOWARD JOHNSON, 11543 S. Haas Avenue, Los Angeles 47, Calif
TEM JOHNSON, 444 W. 68th Terrace, Kansas City 13, Missouri
JIM KAGAWA, 1513 W. 124th St., Los Angeles 47, California
DENNIS KARGOL, 7502 West Berteau, Chicago 34, Illinois
DON KINTZELE, 2016 S. 68th. St., West Allis, Wisconsin
DICK KOWALSKI, 20203 Moenart, Detroit 34, Michigan
RUDY KLUIBER, 14325 Lakewood Hts. Blvd., Cleveland 7, Ohio
WALTER C. KUTAY, 110 Hatlen, Mt. Prospect, Illinois
CLARENCE MATHER, 1224 Franklin Blvd., Ann Arbor, Michigan
CHUCK MEYERS, 4208 N. Leslie Ave. Indianapolis 26, Ind.
WALLY MILLER, 22142 Welby Way, Canoga Park, California
RICHARD MILLER, P. O. Box 27, New York 23, New York
WALTER MUMPER, 724 E. Michigan St., Ottawa, Illinois
TED PFEIFFER, 1740 Menahan St., Ridgewood 37, New York
LEE POLANSKY, St. Joseph's Church, L.B. 987, Bryan, Texas
GUY ROGERS, 1333 Norwood, Hurst, Texas
C. V. RUSSO, 143 Willow Way, Clark, New Jersey
GENE SCHAAP, 4539 S. Spaulding Avenue, Chicago 32, Ill.
WALTER SCHRODER, 551 Fifth Avenue, New York 17, New York
DICK SHERMAN, 408 River Road, Tewksbury, Mass.
CHARLIE SOTICH, 3851 W. 62nd Place, Chicago 29, Illinois
PETE SOTICH, 3851 W. 62nd. Place, Chicago 29, Illinois
CHUCK TRACY, c/o CLEVELAND PRESS, Cleveland 14, Ohio
ED VESELSKY, 2752 A Chippewa, St. Louis 18, Missouri
W. J. WILLIAMS, 1348 N. 2nd. Avenue, Upland, California

Although overseas modelers cannot vote for issues which affect only U. S. indoor flyers, their opinions are welcome and desired, the practice will be to make foreign subscribers honorary members of NIMAS. The first of our honorary members is: Boyd Felstead, 12 Kellatie Rd., Montagu Bay, Tasmania, Australia.

As a matter of reminder, the way to join NIMAS is to send $3 to Bud Tenny, Box 545, Richardson, Texas. As a member you will receive a year's subscription to INDOOR NEWS AND VIEWS, decals for your equipment (eventually), and the chance to guide the present and future development of indoor flying.

Speaking of the decals, we should have a preliminary sketch available before too long. Please have patience on the matter of the decals, since the design, art work, etc. are a matter of spare time work.

Spare time? What's that? If you have received a post card in answer to a letter, please don't be offended. Your editor initiated about ninety letters and cards in answer to incoming mail during December, and the present total as the paper is being put to bed is 103 during January, with about 10 letters waiting.

The last paragraph was <u>not</u> a gripe, the response to INDOOR NEWS has been terrific and gratifying! Without all this mail, we would have to write the whole thing, and the results would be far from satisfactory. Thanks to all!

****FAI INDOOR REPORT****

At this time of the year, the main FAI Indoor news is the where? and when? of the elimination contests. Our information is somewhat sketchy for some areas, so we can only plead for more info. For all FAI CD's, if you have a minute after notifying your Area Committee Chairman, drop INDOOR NEWS, Box 545, Richardson, Texas a line so we can spread the word. Free publicity never hurt any contest!

<u>FAI INDOOR LOCAL ELIMS</u>

Moffet Field - April 2, 1962 , Moffet Hangar??
Joe Bilgri, 256½ Locust St., San Jose, California
Los Angeles - April 21, 1962, L. A. Armory
Dave Copple, 823 S. Mariposa, Apt.1, Los Angeles 5
Kansas City - Tentative
Tem Johnson, 444 W. 68th Terrace, Kansas City, Mo.
Wichita, Kansas?????

Detroit - Tentative
Dick Kowalski, 20203 Moenart, Detroit, Michigan
Chicago - March 31, 1962
Pete Sotich, 3851 W. 62nd Place, Chicago, Illinois
Cleveland - Tentative
Owen O'Malley, 3115 Stanfield Dr., Parma 34, Ohio
Dallas - April 7, 1962, S.M.U. Coliseum, Dallas
Bud Tenny, Box 545, Richardson, Texas
St. Louis????

EAST COAST???
Richard Miller, P. O. Box 27, New York 23, New York

<u>FAI INDOOR QUARTER FINALS</u>

Moffet Field - May 7, 1962, Moffet Hangar??
Joe Bilgri, 256½ Locust St., San Jose, California
Los Angeles - May 19, 1962, L. A. Armory
Dave Copple, 823 S. Mariposa, Apt. 1, Los Angeles 5
Dallas - April 29, 1962 - Livestock Coliseum, Dallas
Bud Tenny, Box 545, Richardson, Texas

<u>FAI SEMI FINALS</u>

West Coast - June 4, 1962, Moffet Hangar??
Joe Bilgri, 256½ Locust St. San Jose, California

****CHECK THAT CEILING****

In our December issue, "News From Around The Country" column, a report was made of record applications made on flight made in a school gymnasium in Topeka, Kansas. Since no late AMA Rule Book which listed the definition of ceiling heights was available, Richard Black, CD, submitted the flight times for record processing. Upon receipt of a new Rule Book containing the proper information (Par. 10.21), Mr. Black requested that the record applications be withdrawn, and published a letter of apology in "Slipstream", the newsletter of the "Propbusters". model club.

Now that the late 1961 issue of the AMA Rule Book is available, it is not redundant to check the ceiling height definition, to make sure that you have the correct idea in mind. This is true whether you are a CD or contestant who might want to make a record application.

Briefly, the correct definition is that height which can be seen by standing under the highest part of the flying area and looking straight up. Several suggestions can be made about methods of measurement, but the two easiest are: first, check the building blueprints if they are available. The second method, and by far the most common, is to use a balloon to carry a tape measure up, or mark the string at ground level with the balloon touching the top. The string length plus the balloon diameter is the ceiling height, use the book to determine the ceiling Category.

The flights in question are: Open HLG, Open Paper Stick, Junior B Stick, Junior B Cabin, and Junior A ROG. The correct <u>official</u> times for all indoor records can be found on pages 22-23 of the December 1961 MODEL AVIATION, and this list will stand until a later list is published.

An <u>unofficial</u> listing of recent flights which have been submitted for consideration is found elsewhere in the paper, in the column entitled "Records? Maybe".

RECORDS? MAYBE!

Despite repeated efforts by your editor, he has been unable to get new records published month-by-month in MODEL AVIATION. Since this is the only source of official record listings, it has been decided to institute this column on a trial basis.

How long this column lasts will depend upon reader-and-CD response to the effort. Our listing will be unofficial, gleaned from info furnished by flyers and CD's after their contests.

The main service intended here will be to keep indoor flyers informed on the state of the art, and to eliminate some paperwork by advance information of pending records.

Great Lakes Indoor Air Meet - January 7, 1962 CATEGORY II
Open Paper Stick - 14:57, Mike Karlak
Junior ?(B or C) Stick - 12:06, Ronald Roharik
Senior B Stick - 10:50.8, Daniel Tracy

Record Trials, Seattle, Washington, December 30, 1961
CATEGORY I
Open B Stick - 14:23.1, Phil Hainer
Note: Applications were made for flights in Jr. A ROG, Senior C Stick, and Senior Helicopter, we were unable to get the times.

Chicago Aeronuts Indoor Record Trials, January 27, 1962
CATEGORY I 75' Ceiling
Senior D Stick - 4:08, Chad Krogh
Open D Stick - 15:20, Charlie Sotich

CATEGORY II 22' Ceiling
Senior Paper Stick - 11:35.2, Dennis Kargol
Junior A ROG - 6:04.8, Jim Skarzynski
Senior A ROG - 5:04.8, Chad Krogh
To forestall comments about two categories at one contest, the report pointed out that the Category II records were set in the Madison Street Armory Drill Hall, and the Category I flights were made in a large lecture room, with a 22' ceiling, same building.

Walnut Hills Record Trials, Dallas, Texas, January 14, 1962
CATEGORY I 20' Ceiling
Senior Paper Stick - 5:09, Terry Hamer
Senior Helicopter - 0:37.0, Kit Bays

Record Trials, Wilmington, January 12, 1962
CATEGORY I 29' 11" Ceiling
Senior Helicopter - 1:20.8, Larry Renger
Senior A ROG - 3:59.1, Larry Renger

The format shows the information we would like to have, so here it is. If this is important information to enough people, the column will probably stay.

RECENT BOO-BOOS

Into each life some rain must fall, and your editor was recently splashed twice in the same month.

In our November summary on Hacklinger's superb pace setting FAI model, we made some slide rule errors, and also our source was in error. From now on, all our info will come through Dick Kowalski if it deals with foreign models. This will then leave only typographical errors to bug us!

The correct poop on Max's model is as follows: wing area - 153 sq. in.; stab. area - 51 sq. in.; and the prop was 19 x 30. The model weighed .030 oz. and Dick guesses that a loop of .055 pirelli about 15" long was used.

The second dousing came when Chuck Borneman gently reminded us that his club is named "Knights of the Round Circle", in spite of our efforts to change the name.

Our sincere apology to all for these errors, but the proof-reader must have been asleep!

****A MIGHTY BIG SHOW****

On January 7, 1962, the worlds biggest and best annual indoor air show became history, with 5013 official flights needed to pick the winners of 21 events. No one who has never attended a Great Lakes Indoor Air Meet can imagine the preparation necessary for such a contest, or even conceive how that many flights can occur in one day in one building. This Chuck Tracy must be the world's greatest magician!

A little simple arithmetic shows that over ten flights would have to start every minute, and that on occasion, hundreds of models would have to be in the air at once for all these flights to be completed.

All of this, one day, one contest, one building, and the attendance was lower than expected because icy roads prevented some out-of-town entrants from attending!

The times were all very good for the crowded air space, and some were even record breaking. The top HLG time was 1:04 by Don Eble (Open); Jim Skinner (Senior) put his prefab up for 2:17; Paper Stick topped out at 14:47 for a new national record (Mike Karlak, Open); and Larry Mzik made the longest Stick flight (Open) with 13:31.

****FUN MODELS****

Last month we reported briefly on "fun models" which have been growing in popularity all over the country and even are catching on in some foreign countries. We also mentioned that this model class could be substituted for the nearly defunct Paper Stick proposal.

After careful consideration, we feel that any attempt to build a new national event around such a model might create a lot of problems unless the rules are carefully written. On the local scene, we have no doubt that these "quickie" models are the greatest thing ever for indoor flying.

Some of the more experienced indoor flyers who haven't tried "fun models" have expressed doubts about their value, or are just ignoring them hoping they will go away. If these fellows are in a very active group of indoor flyers and have practically permanent sites, this might very well be a logical approach.

However, if the majority of flyers in your area shy away from indoor, and sites are hard to find, these models are just the ticket! First, and most important, this type of model is so simple that almost no one will admit that they can't build it. For years, indoor has had the unjust reputation of being an event for the "expert's expert", and the average reaction to an indoor model has been "My, isn't-it-pretty-but-it-looks-too-hard--I-can't-do-it."

The fun model, while it is simple to build, and looks the part, will turn in times nearly as good as the best of the "full house" models in the average low ceiling site. The apparent inconsistency here is easily explained, by considering the wing loading and the size of the bird. It has a higher loading, and thus is less affected by drift which easily shoves the "pro type models" around. Also, it very common for one of these to approach an obstacle which immediately hangs the big model, and it slips to one side and blasts off again.

Finally, the experts who fly these things will readily fly in sites they wouldn't think of putting their "good" models in. If one is completely wrecked, so what? About 4-6 hours and another one is ready to go!

The Wilmington Indoor Model Airplane Club (WIMAC), the first exclusively low ceiling indoor group, has flown their Easy B class for over a year. Wally Miller, who built the first one, tells the story:

"I feel we should start at the very beginning, which was back in September of 1960. At that time my eight year old son, Don, expressed a desire to build an indoor model. Realizing his limited capabilities, a great deal of thought went into a design that would be the ultimate in simplicity and still possess enough flying ability to satisfy his young ego. Solid components were decided upon for the above mentioned reasons and the "Easy B" was born.

The wing, stab, and rudder outlines on this first "Easy B" were constructed of 3/32" sq. Sig with 1/16 x 3/32 ribs, the motor stick and prop were indoor wood. He managed to complete 75% of this model on his own, but Dad had to build the prop and do the final assembly.

The following month at the Armory, (42' ceiling) Lew Gitlow was on the winder and approximately 900 turns were put into a short loop of 1/16 Pirelli. To the amazement of everyone this flight lasted 3½ minutes! Subsequent flights on a longer loop produced a consistent 5 minute + model, with a high time of 5:33.

At this time, Dave Copple, who is always wide awake, realized the terrific potential of this solid component model. The following month Dave and I had both built our first "Easy Bees", weights ran around .035 and times were 7 to 8 minutes using .040 Pirelli. This was the clincher. Plans were published in WIMAC NEWS and regular monthly competition began. It has been, to be as modest as possible, a roaring success ever since. This I am sure, is due to the extreme simplicity of the solid component formula, coupled with high performance and regular monthly competition.

We hold two separate contests each meet using the unlimited attempt system over a given time limit, usually 3 hours each, top time wins. Boy, does this ever get action. Processing is by "Eyeball" (who ever heard of a dishonest indoor flyer?)

During the past year our Easy B compteition has evolved into two classes, novice and expert. The beginner's models usually weigh out around .040 oz. and fly on .040 Pirelli. Performance of 5 to 6 minutes at Wilmington (30') and 6 to 8 minutes at the Armory (42') is normal. The expert, on the other hand, builds in the low 20's and flies on .025 Pirelli. Tom Finch and Lew Gitlow have built as low as .017.

Frank Cummings currently holds the Armory record with 11:18 and yours truly holds the Wilmington record at 10:04.

It is extremely satisfying to see the smiles on the faces of these top flyers in the heat of competition instead of the usual serious frown. This is truly the funniest indoor formula ever developed."

About nine months ago your editor, inspired by the success of the Parlor Mite (M.A.N. Feb.'62) and by reports of early flights on the Easy B models, decided that a class B model could be built to fly in the living room or <u>any</u> site immediately available.

The first Baby Bee model was built ruggedly, using a minimum of indoor wood, and weighed .047 oz. After over 200 flights by novices of all age groups the model is still going strong and weighs .049 oz. Very little damage has resulted, in spite of the fact that most of the flights were completely unsupervised and followed minimal instruction on holding, winding, and launching the model.

Top times on this model are: living room - 3:36 (after two hours of trying), Walnut Hill site (20') - 5:15 for each of two consecutive flights, and a 50' fieldhouse - 6:30. We feel that this model, although smaller than the Easy B formula (43 sq.in.) potentially has much higher performance than it has shown. About ten of these models have been built locally, and all have flown well. We have used the Baby Bee for an indoor primer, often as the first model or at least the first indoor model.

The first two contests in the Ft. Worth-Dallas area especially for fun models resulted in many flyers entering that had never flown indoor before, and the future looks even better.

The Wilmington Easy B rules are: "All outlines of flying surfaces must be straight lines, all components solid, no bracing of any kind, anywhere. Prop blades must be sheet balsa only. Covering is optional. Maximum span - 18", maximum chord - 3", maximum stab area - 27 sq. in. or 50% of the wing area."

The E-Z-Bee rules (Ft. Worth-Dallas) covering the model are: Maximim wing span - 18", maximum chord - 3", prop blades must be all balsa, covering optional. These contests used both Novice and Hotshot classes, and the first two Junior Novice winners were Bobby and Cheryl Crowley, both less than eleven years old!

QUESTIONS AND ANSWERS

For the questions covered this month we took a little different approach, and selected a panel with one flyer from each ceiling Category, that is, Hal Cover for Cat. I Dick Kowalski for Cat. II, and Ernest Kopecky for Cat. III. To a certain extent, their approach will be shaded by the type of flying that they do the most, even though they all fly in other ceiling heights.

The questions asked this panel were as follows:

5. What about a definition of efficiency and ways to measure it, emperical or theoretical? (This question was also asked of the last panel - see January issue for more comments on this one)
9. What is the best wing location? Over the C.G. of the airplane or over the C.G. of the rubber motor? Other?
10. What is the best camber for props - high or low?
11. We have been using roughly a 50% prop diameter to wing span ratio. Hacklinger used a 64% ratio. Comments?
12. Why are tails on indoor models built to low aspect ratios instead of high aspect ratios?

Answers - #5

<u>Hal Cover</u>: "My simple definition of efficiency when discussing indoor model is as follows: The percentage of actual flight time vs. the calculated time.(winds in motor divided by RPM). This of course does not give any indication whether the loss of efficiency comes from the prop, airfoil, incidence settings, or weather conditions; but I don't think anyone can pin down any one of these to any extent anyway."

<u>Dick Kowalski</u>: Efficiency (with respect to model aircraft) is a measure of quality of performance as compared with theoretical expectations. I believe there are three types of efficiency an indoor modeler would be concerned with: aerodynamic efficiency, prop efficiency, and power train efficiency. These can be defined as follows:

Aerodynamic efficiency - that which dictates the flight path and velocity needed to maintain flight, such as flying surfaces, airfoil sections of each and their matching to each other, angle of attack, etc. A model which flies slower and has a lower sinking speed will give the most duration.

Prop efficiency - The prop which gives the greatest thrust with the least torque applied is the most efficient.

Let W = work consumed, and: Then:
F = force applied
$2\pi M$ = prop moment for one revolution
T = number of turns

$$W = F(2\pi M)T$$

To lower any of these factors would give a lower rate of consumption of energy stored in the motor, and increase the propeller efficiency.

Power Train Efficiency - The power train includes the prop and the rubber working as a unit. The factors involved here are complex, but basically consist of energy potential (total work delivered by the rubber), the rate at which that energy is consumed, and how much work it is doing in terms of thrust. To a degree, power train efficiency is a matter of matching both the rubber and the prop to do a given job.

<u>Ernest Kopecky</u>: Although Ernest did not speak directly about efficiency, he did make some comments which we feel are valid, particularly with regard to Category III:

"It has been my contention for a long while that there was no mystery about long flights and record flights. Almost all ships today are fairly conventional in proportions. One kind of dihedral or another, elliptical wing or rectangular planform, etc., these are minor and do not make the difference. In my opinion, (and I have plenty of opposition to it) it is not the size of the model but the wing loading that is the magic key to forty minutes plus!

Ships that are correctly trimmed, props about equal in pitch to the wing span, and that most important wing loading of .00045 oz. per sq. in. or less, models like that are the potential record breakers - on a very good day, of course! Pete Andrews probably would have made forty minutes with his record "C" in 1949 if he had the pirelli rubber we have today. HacMlinger's wing loading of about .00045 confirmed it."

Answers - #9

<u>Hal Cover</u>: "The best wing location would be over both the C.G. of the airplane and the C.G. of the motor. With a 50% C.G. location, the plane is easy to trim and by also having the motor C.G. at the same place the trim is not affected when motor sizes are changed."

<u>Dick Kowalski</u>: The wing must be located over the model's C.G. correctly, but every effort must be made to get the C.G. of the motor close to the model's C.G. to minimize the effect of uneven winding, which would change trim.

<u>Ernest Kopecky</u>: The best wing location depends entirely on areas and moments. The greater the stab area the further the C.G. should be from the wing leading edge. (50% stab - 100% C.G.; 30% stab - 60% C.G., etc.) I fly 50% C.G. and a 23% stab and about two and one-quarter times the wing chord for the tail moment. This set-up easily trims out, handles full power smoothly and produces a cruise just short of mushing.

Answers - #10

Hal Cover: "I believe the low camber is much better, going to a thick prop section increases drag without improving thrust enough to make up for the extra power needed.

It has been shown by many fliers that the Easy B class plane many time flies as well with a flat prop (no camber) as it does with a cambered prop. I have found that props with excessive camber are nothing but a headache - they definitely do not perform well when compared to a thin section (Bilgri prop)."

Dick Kowalski: "No comparative data available for prop camber. I use a 6% arc."

Ernest Kopecky: "I use 7%, but it can vary with flying conditions. Rather than add more power or shorter rubber which might change the C.G. or change to a lower pitch prop to get that extra 30' of altitude, change from a 7% camber to a 4% camber sacrificing 1 or 2 RPM, but gaining in overall time from the extra height."

Answers - #11

Hal Cover: "When a higher percentage prop diameter to wing span ratio is used, the planes generally are not too consistent, but when all goes well the plane will perform better. I prefer having a more consistent flying ship (50 - 55%) prop-wing ratio, especially in low ceiling flying where it is difficult to get any type of consistent performance."

Dick Kowalski: "The ratio of prop diameter to wing span means little except as a comparative term. It does not indicate that large props are going to yield more time necessarily."

Ernest Kopecky: It is a generally accepted fact that the closer the tip blade angle is to the plane of rotation the more efficient the prop is. For example, a 19 x 32 prop would be more efficient than a 16 x 32 because of the lower tip blade angle, with other factors being equal. However a problem arises with the lower P/D prop during the latter part of the flight or during the cruise. The lower blade angle of the prop acts as a brake actually causing the model to come down prematurely because its flying speed is being retarded by the prop.

Answers - #12 Although all three panel members agreed on the fact that low aspect ratio stabs have a higher strength to weight ratio, there were some interesting side comments made also.

Hal Cover: "If the stabs were 200-300 sq. in. in area, the actual shape and aspect ratio would be important, but since they are nowhere near this size, I believe that there is no advantage to high aspect ratio stabs."

Ernest Kopecky: "I don't see why with the trend toward bracing the stab we don't switch to high aspect ratios for more efficiency."

In December, this column was kicked off with three questions thrown out for general comment. Right after the January issue Dave Call sent, with profuse apologies for the press of business which prevented an earlier answer, the following comments:

Question #1 "In regard to relationship of prop area to wing area, I haven't worked out any parameters although I feel this should be done. My rule of thumb is, as the diameter of the prop and its area increases, I raise the wing above the thrust line. Also I increase both the aspect and area of the rudder. Sorry, I have no formula for this, although I'm sure one could be developed."

Question #2 "I seldom set a lifting tail at a positive angle of incidence, mainly due to poor climbing ability under full turns and greater forward speed. This again is based on high ceiling flying."

NEWS FROM AROUND THE ~~COUNTRY~~ WORLD

AUSTRALIA - TASMANIA

One of the "old-timers" in indoor flying "down under", Boyd Felstead, has been corresponding with us for some time. In his most recent letter he points out that the University of Illinois has a new assembly hall which should be ideal for indoor flying - he read about it in a U. S. magazine! How can we miss, with even our foreign members scouting sites for us?

CALIFORNIA - BAKERSFIELD

Herman Bakersfield reports that his club is almost certain of getting a school gym there for a site. He also reports some interest in "fun models" for an ice-breaker.

COLORADO - DENVER

George Batuik reports that the Martin Model Masters have scheduled their first indoor contest of the season in February and promised a report of results when available.

ENGLAND - MALVERN, WORCS.

Reg Parham, another "old-timer" indoor flyer and a member of the 1961 British FAI Indoor Team, wrote a letter promising to give us news on occasion. He passed along the info that there will be at least four meets in Cardington Airdock this summer, in addition to the FAI Indoor Finals.

ILLINOIS - CHICAGO

Charlie Sotich reports that Tommy Neuman got two flights over 19 minutes with his FAI recently, with a top of 19:36.6. Tommy is one of the regulars at the Armory, and his flying is consistently improving.

Some of the fellows have also been flying Dinky Dips, a fun model developed by Charlie, and times have been going over 5 minutes.

MASSACHUSETTS - BOSTON

In Boston the indoor flyers do some flying in a 42' Armory, according to Ray Harlan. Ray works at M.I.T. and also attends classes there, but still finds some time to work on his FAI ships for the upcoming elims.

MISSOURI - KANSAS CITY

Both Dick Black and Tem Johnson reported on the activity in Kansas City. On schedule so far are about two contests in a small site in an attempt to build up total activity enough to warrant a larger site and a FAI local elims. Tem is also working to secure a site for the FAI Semi Finals in Kansas City. Dick Ganslen did the initial contact work, and Tem is acting as a local rep for the FAI Committee.

NEW YORK - NEW YORK CITY

Richard Miller, in his local newsletter NIMAS/EAST, reports on growing activity in the general area of New York. To qualify themselves for using the State Armory in Brooklyn, over 30 indoor flyers formed a club named Nimas/East and applied for liability insurance and an AMA Charter. Very soon they expect to start using the armory on Tuesday evenings from 7:30 to 10:30.

Dozens of indoor buffs showed up to fly and look-see at a small auditorium in New Jersey recently, there were so many planes in the air that it posed a real problem!

NEW YORK - NORTHPORT

The Greater New York Interclub Organization voted to add a fun model class to their list of events which form the basis for their high point system. This group flies an impressive list of 12 events during the contest season in an interclub competition which picks the outstanding flyer and the outstanding club each year. A real busy bunch!

NEW ZEALAND - UPPER HUTT

John Malkin, Upper Hutt Aeromodellers, indicates that there is a revival of indoor activity in New Zealand. Under the capable mail guidance of Dave Copple these boys are flying the Easy B class with good results in spite of the difficulty getting good supplies.

John and some others hope to have New Zealand flying by proxy in the FAI World Indoor Championships. Because of the high cost of shipping models, the models will just be sent one way.

OKLAHOMA - TULSA

The Tulsa Glue Dobbers are trying to find an indoor site to hold some contests, Dave Carter in the man to see for info. Willard Kehr, FF Group Reporter, said in the GLUE DOBBER'S NEWSLETTER, "At least this one won't be called off on account of weather."

TEXAS - BRYAN

Lee Polansky reports the availability of a coliseum near Bryan which should be a good indoor site. Lee has a group of students flying Baby Bee models in the gym on bot[illegible] Saturday and Sunday afternoons, how lucky can you get?

TEXAS - FT. WORTH-DALLAS

The indoor schedule is beginning to bunch up a little with another contest by the Cliff Model Club late in February, a Category I RT in Garland, and FAI Local Elims and Quarter Finals presently on schedule. Rumor has it that one or more Ft. Worth clubs are planning some indoor events if they can tie down a site.

THE HAND LAUNCH GLIDER

PART THREE

by RICHARD MILLER

HISTORY (cont.)

In the years immediately following WW II IHLG supremacy fell into the hands of the second of the three clubs (the Chicago Aeronauts having been the first) that was to make it a specialty and set significant records: The Oakland Cloud Dusters.

By as early as the '48 Nationals Pete Demos had established a new national record of 1:12. In an article in the March 1949 M.A.N. significantly entitled "The Polly Glider" Demos tells of the high interest in IHLG among the Cloud Dusters in those days; how in '47 he established the "B" Open record of 1:03.8 which Andrade subsequently broke with 1:07.8 and then lost to Rambo who broke the 1:10 barrier with 1:10.8 Somewhere along here Bilgri did 1:07, a fact which may surprise those who think he's only a first-rate Wakefield flier and World Indoor FAI Champ. The next significant mark in IHLG, 1:14, also went to a Cloud Duster, this one being Foster's flight at the '52 Nationals. This flight was a high water mark in the annals of glider flying but it was also the point at which the Dusters began to fade from the IHLG scene.

The factors which contributed to this very remarkable period of development are not too hard to detect. A design factor, polyhedral, which had been tried only occasionly before, was used extensively and fully exploited by a group of outstanding model builders in a club second to none. Add the use of the Moffet hangar to that and it is easy to see why IHLG records and the development of the glider have only inched above the accomplishments of the Cloud Dusters in their heyday, green and golden.

The Skyscrapers

If we divide IHLG progress into duration intervals of five seconds we can say that the Dusters, after a brief warm-up, exploited the one between 1:10 and 1:15 and that the next five second interval, the one between 1:15 and 1:20, fell to the Brooklyn Skyscrapers. The Skyscrapers are not, of course, the only ones to have passed the magic 1:15 mark. Tem Johnson, or at least one of his gliders, did it with 1:16.2 and so did Bob Dagand with 1:16.4. And Lee Hines, as a senior did 1:17.2 at the '57 Nationals.

About here the Skyscrapers took over. Bill Dunwoody came along with perhaps the best all-round indoor glider ever designed, his "Curly" (M.A.N. - May '59) and set a new Open record of 1:17.4. Following this, Pete Nishanian, a sometimes Skyscraper, broke Bill's record with 1:18.8 ('59) and about a year after that I squeeked in over Pete with 1:18.9. Although Bob Hatschek's highest time is just .02 seconds short of the 1:15 it deserves very special mention for having been set with his 10:1 aspect ratio Hi-Hat, a design which, inspired by some experiments by Stu Savage, Bob pioneered.

The Future

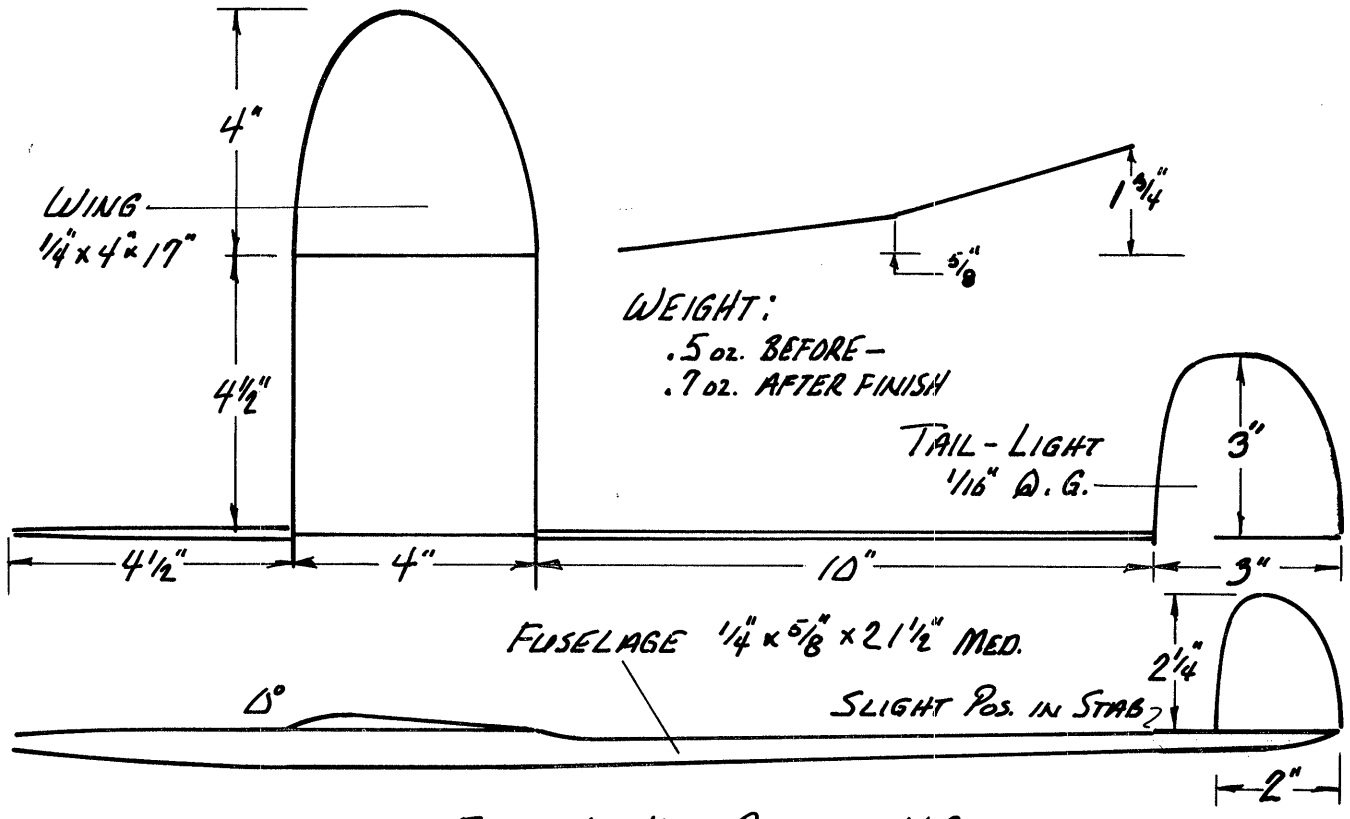
The next ten second, the 1:20 to 1:30 range, are not going to be easy to come by. To those who have thrown in the vicinity of 1:15 the problems are evident; to those who haven't spent a minute-and-a-half looking at your stop watch will convince you that a glider has to go mighty high and come down mighty slow to hit 1:30.

Perhaps Category I and II records leave more room for exploitation than the unlimited class does, although Otto Heithecker's 1:15 in Category II won't be easy to beat.

In any event IHLG has reached a level of development at the beginning of the '60s that is going to make it increasingly difficult to establish new records. Perhaps high aspect ratio will provide the solution. I wouldn't go so far as to say that the medium AR glider (5:1 to 7:1) has gone as far as it can go but I do feel that the HAR machine, once its aerodynamic peculiarities are mastered, is the most likely contender for the 1:30 mark and that its very special advantages should make it especially potent in low and medium ceiling flying.

What happens in the next few years is bound to be interesting and, record fever aside, a lot of fun.

-30-



INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." MARCH 1962

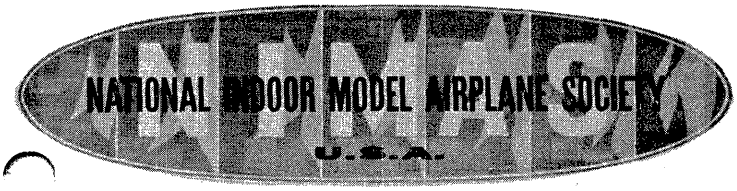
****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

During the month of February NIMAS gained sixteen regular members and one honorary member, for a total of sixty-four members as of February 28, 1962. Here are the names and addresses of the regular members:

BILL BIGGE 5131 Mass. Avenue, N.W., Washington 16, D. C.
ANTHONY BUCZKO, JR., 5312 King Ave., Pennsauken, N. J.
JIM CLEM, 3505 Rosedale, Dallas, Texas
ROBERT COWLEY, 1481 Lincoln Avenue, Lakewood 7, Ohio
ALEX F. CRAIG, M.D., 415 Raintree Dr., New Castle, Ind.
WALTER ERBACH, 2979 Dudley, Lincoln, Nebraska
GEORGE FLEMMING, JR., 2819 E. 103 St., Chicago 17, Ill.
W. F. GAMBLE, 73 Harold St., San Francisco 12, Calif.
R. L. HATSCHEK, 316 Grosvenor St., Douglastown 63, N. Y.
LEE R. HINES, 20346 Hawthorne, Torrence, California
MIKE KARLAK, 16038 Egbert Rd., Bedford, Ohio
ALEX KONOPACKI, 101 Birchwood Rd., Paramus, N. J.
GUY NEGRI, 2105 Sigwalt, Rolling Meadows, Illinois
TOMMY NEUMAN, 1350 Davine Dr., Glendale Heights, Glenellen P. O., Illinois
CHARLIE PRIMBS, 2924 Famosa, San Diego 7, California
JOHN G. TRIOLO, 195 Parsippany Rd., Whippany, New Jersey

Finally, REG PARHAM, 21 Davenham Close, Malvern, Worsc. England, is our latest honorary member.

As we had hoped, we now have one decal sketch ready to show, and there is another one in the works. Let us have your ideas, comments and suggestions on this one:



The background ellipse represents a microfilm wing, and the color is two-tone blue, representing light reflections from the film. Since there is little to suggest that NIMAS also has glider-flying members, let's have suggestions from the glider boys, also!

Liability insurance is something that all types of model flyers need to be concerned with, and Richard Miller's newly-formed NIMAS/East club has found an insurance plan that sounds pretty good.

When the New York area indoor flyers tried to obtain permission to use the Brooklyn Armory, they found that insurance was almost the only requirement that couldn't be easily met. After some looking, they turned up with insurance issued by Heber Smith Morris, of Alexandria, Va. which satisfied the necessary authorities and closed the deal, both for the insurance and for the Armory.

The cost of a $20,000 liability policy is $34.50 minimum premium deposit, and coverage for additional members at the rate of $1.27 each. This covers the notification of officials, organizations, etc. that the policy is in effect if proof is required, gives similar coverage to our AMA insurance plus member-to-member coverage under one type of insurance. Since space is limited, interested parties can contact Heber Smith Morris, 113 North St. Asaph Street, Alexandria, Virginia for more information.

****NIMAS BALLOT****

At long last we have a need for an official position on all the various indoor rules proposals that are now in the hands of the Contest Board. So now members of NIMAS can exercise their pencils and express their feelings on each of these indoor rules proposals.

In all cases such as this, a point sometimes overlooked is that a change may not be necessary just because a rules proposal has been made. If you feel that this is the case for any or all of these proposals, feel free to reject the unnecessary proposal, but at least express an opinion. If these pass, you will have to fly under them, so don't say anything later if you keep quiet now. Put up or shut up!

Lee Hines has asked us to announce that a movement involving several people, including Richard Miller, Dave Copple and Hal Cover, is getting under way to try to set up Indoor HLG as another FAI event.

The results of the poll (seven Charter Members) were: "for" Proposal A (solid component HLG), "against" any change in Paragraph 10.6 (solid stick proposal), and "against" any change in indoor wing area rules (unlimited D stick).

If there is any question about any of these proposals or why the poll results went as they did, you may contact the following for further information:

JOE BILGRI, 256½ Locust Street, San Jose, California
DAVE COPPLE, 823 S. Mariposa, Apt.#1, Los Angeles 5, Calif.
DICK KOWALSKI, 20203 Moenart, Detroit 34, Michigan
RICHARD MILLER, P. O. Box 27, New York 23, New York
PETE SOTICH, 3851 W. 62nd. Place, Chicago 29, Illinois
BUD TENNY, Box 545, Richardson, Texas
CHUCK TRACY, c/o CLEVELAND PRESS, Cleveland 14, Ohio

Late last year, the three HLG proposals (Questions I, IV, & V) were submitted to the Contest Board, but the vote results failed to reject any of the proposals, and also failed to approve any of the three for further study by the required vote. 1962 Chairman Bob Hatschek, realizing that if any action were to be completed in time for 1963 rules, submitted his alternate proposal to the CB, and to Pete Sotich, Dave Copple, Dick Kowalski, Richard Miller, and Bud Tenny for their comments.

Bob formulated his proposal after noting that, even though no HLG proposal received a large enough vote, the vote indicated clearly that "mike HLG" should be eliminated and that the method - minimum weight for HLG (set forth in Questions IV & V) received a majority of votes.

To use the ballot, simply mark "for" or "against" on each question, and mail the ballot to Bud Tenny, Box 545, Richardson, Texas. Please decide as soon as you can and do not delay sending in the ballot. If you subscribe to INDOOR NEWS, and wish to have your ballot count, send $1 to join NIMAS. Non-members may express their opinions on the ballot, and the results of the poll will be published.

****FAI INDOOR HLG??****

Lee Hines has asked us to announce that several people, including Lee, Richard Miller, Dave Copple, and Hal Cover are working to set up Indoor HLG as another FAI event. If you are interested, and desire more information, contact Lee Hines, 20346 Hawthorne, Torrence, California.

From a personal standpoint, we feel that the FAI program is a very beneficial program, and a logical one to be involved in when the AMA position in the international modelling picture is considered. At the same time, the Academy was established years ago to co-ordinate and aid model competition in the United States, and here lies the first responsibility of the Academy today.

It is becoming generally known that the AMA may be in some financial hot water, and many lay the blame at the feet of the FAI program. Certainly, there would be more money available to spend on domestic modelling if there were no committments for participation in FAI. How much more we may never know, but we question the right and the advisability of spending any AMA money except postage and office overhead expenses necessary to co-ordinate the two programs.

Therefore, while we are glad to see more FAI interest and participation planned, we must caution both those who would add more events to the FAI program, and those who plan and participate in the present program, that FAI must be a completely self-supporting program. If this is not a primary goal of all FAI flyers, we stand a good chance of losing both the FAI program and the domestic program in the present forms.

If the AMA should fail to set its financial house in order, and cease to exist as an organization, the contact with the NAA, and therefore with FAI, will be lost. We will then be in the same state or worse as before AMA was formed, and there will be no FAI program at all.

How to finance the FAI program is something we have pondered and worried about for some time, with no real ideas coming forth. But this problem must be solved, or the future of organizied modelling in the U. S. faces a dim future. Contrary to the belief of some people, a spot on a FAI team is only the right to go, and not the means to finance the trip. No one has the right to take or expect money to finance a trip to Europe on the basis of $3, $4, or $6 dues paid per year - contrary to past performances of most of our teams.

****FAI INDOOR REPORT****

Local Elims

Chicago - March 31, 1962, Madison Street Armory
Pete Sotich, 3851 W. 62nd, Pl., Chicago 29, Ill.
Kansas City - April 1. 1962, Kinnick Hall, Olathe N.A.S.
Benard Drummond, 9115 Charlotte, Kansas City, Mo.
Dallas - April 7, 1962, S. M. U. Coliseum, Dallas
Bud Tenny, Box 545, Richardson, Texas
Moffet Field - April 15, 1962, Moffet Hangar
Joe Bilgri, 256½ Locust St., San Jose, California
Los Angeles - April 21, 1962?? Wilmington Rec. Center
Dave Copple, 823 S. Mariposa, Apt.#1, Los Angeles 5
Detroit - Tentative
Dick Kowalski, 20203 Moenart, Detroit 34, Michigan
Cleveland - Tentative
Owen O'Malley, 3115 Stanfield Dr., Parma34, Ohio
Lakehurst - Tentative - April 8, 1962
Richard Miller, P. O. Box 27, New York 23, New York

Quarter Final Elims

Chicago - April 28, 1962, Madison Street Armory
Pete Sotich, 3851 W. 62nd Pl., Chicago 29, Ill.
Dallas - April 29, 1962, Livestock Coliseum, Dallas
Bud Tenny, Box 545, Richardson, Texas
Moffet Field - May 6, 1962, Moffet Hangar
Joe Bilgri, 256½ Locust St., San Jose, California
Los Angeles - May 19, 1962?? Wilmington Rec. Center
Dave Copple, 823 S. Mariposa, Apt.#1, Los Angeles 5
Detroit - Tentative
Dick Kowalski, 20203 Moenart, Detroit 34, Michigan
Lakehurst - Tentative - May 6, 1962
Richard Miller, P. O. Box 27, New York

Semi-Final Elims

WEST COAST - June 3, 1962, Moffet Hangar
Joe Bilgri, 256½ Locust St., San Jose, California
EAST COAST - Tentative - June 3, 1962
Richard Miller, P. O. Box 27, New York 23, New York
CENTRAL AREA - Tentative
Dick Kowalski, 20203 Moenart, Detroit 34, Michigan

For those who plan to fly in the Elims at Moffet Field, Joe Bilgri advises that he will have to be notified ten days in advance so he can furnish a list of names to the Navy - you won't be able to get on the field, otherwise!

RECORDS? MAYBE!

The first order of business this month is to correct our goof of last month in giving ceiling heights for the Chicago Armory - the correct listings should be: Armory lecture room, CATEGORY I 22' ceiling, Armory drill hall, CATEGORY II 75' ceiling.

February activity seemed to about normal, but either the birds weren't flying so well or the CD's aren't sending us the info - here are all we have for February:

Wilmington Record Trials - January12, 1962
CATEGORY I - 29' 11" ceiling.
Open HLG - 0:37.0, Lee Hines

Wilmington Record Trials - February 9, 1962
CATEGORY I - 29'11" ceiling.
Junior B Stick - 6:20, Don Miller

Chicago Aeronuts 5th Annual Indoor Contest - Feb. 24, 1962
CATEGORY II - 75' ceiling.
Jr. B Paper Stick - 11:44.5, Jim Skarzynski

QUESTIONS AND ANSWERS

This past month there was no time to query another panel of experts in time for publication. However, the mail has brought in some more questions for general comment:

13. What determines the height of the wing struts? What effect does change in wing height have?
14. What factors control the climb in a low ceiling?
15. Since drift control seems to be quite important in Category I flying, your editor plans a summary of all info on the subject that he can get. So, what do you know about drift control?? Please send along anything you have found out about methods to control or combat drift - maybe we all will learn something!

NEWS FROM AROUND THE WORLD

AUSTRALIA - TASMANIA
Boyd Felstead sent along a picture of his B Cabin model which won the 1950 Aussie Nats with a flight of 12:36 - in a 50' ceiling! It sounds as if Boyd would be right at home in our Category II sites, and a top flyer also.

CALIFORNIA - WILMINGTON
Dave Copple reports that the Easy B has made it into the records column - Don Miller was flying an Easy B for that new Junior B Stick record.

COLORADO - DENVER
The Martin Model Masters held the first of two planned indoor contests this season on February 25. Times were low, due to unfamiliarity with the 33' site. George Batuik reported the times and opined that the next contest would show a big jump in times. High in HLG was 0:23.2, tops in Stick was 5:16.4, and Paper Stick went to 5:56.5.

ENGLAND - COVENTRY
Arthur Barr wrote last month, relating that repairs on Cardington Balloon Shed, recently completed, should further improve flying conditions there. Indoor interest is not as high in England as here, but his club does some low ceiling flying in a 20' x 30' room with a 20' ceiling. Their top times have gone over 8 minutes with a 60 sq. in. ship!

ENGLAND - MALVERN, WORSC.
Reg Parham also reported on the Cardington repairs, and was surprised last year that the U. S. team had rated conditions there better than at Lakehurst. C. S. (Rushy) Rushbrooke has obtained permission for six indoor meets at Cardington this year, the first on April 14-15. The British team should really be ready this year!

ILLINOIS - CHICAGO
The 5th Annual Aeronuts Indoor Contest was a real ball that drew 37 contestants, according to a report from Pete Sotich. Top time in Paper Stick was 13:05, and high mike time was 18:36.0. Tommy Neumann overshodowed even the Open contestants in HLG, with almost a six second lead at 1:09.4. Charlie Sotich reports that it was breezy in the Armory, preventing real good times in rubber events.

KANSAS - WICHITA
Stan Chilton reported that the Cessna club held an indoor club in a small gym, with paper-covered ROG's and HLG events. Top ROG time was 3:46, top HLG was 0:24.2. Wichita activity is still limited by lack of a regular site of reasonable dimensions.

MISSOURI - KANSAS CITY
The Kansas City Model Association sponsored one indoor contest featuring HLG, Easy B, and AMA Stick events. No times were available, but the site was 60' x 30' with a 20' ceiling. A second contest on April 1 will also serve as FAI local elims, and will be held at Olathe N. A. S.

NEW YORK - NEW YORK
The big news in the big city is that the State Armory, 357 Sumner Avenue in Brooklyn has opened up to indoor flying, thanks to the concerted efforts of many of the N. Y. area flyers. The first date is March 6, and we believe that they have several more Tuesday evenings from then thru June 26 lined up.

TEXAS - DALLAS
The second indoor contest this season by the Cliff model Club was a smashing success - 25 entries by 17 contestants. In spite of good conditions, the top stick times were below the building potential - 9:25.8 with a B Stick. Coming on March 11 is a Category I Record Tria in a site which might be the best site available - 105' x 112' floor space with 24' arched roof.

THE HAND LAUNCH GLIDER

PART FOUR

by RICHARD MILLER

DESIGN (General)

Design is a tool, a means to an end. Consequently the beginner, whether his goal is simply sport flying or maximum duration, will probably be best rewarded by putting his energies towards the ends of improving his building skills and practising his launch techniques. Design he can leave to those with more experience.

This would have been less true twenty-five years ago when just about everybody was a beginner in HLG. The high degree of development that HLG design has reached since then make it increasingly difficult to add anything of significance to what now exists. This is not to say either that those who made the contributions that we have access to today were infallible nor that there isn't a lot of room for the patient and imaginative designer-innovator to express himself. It is to say that it is shortsighted to ignore the hard-won conclusions of our forebearers and that we are better off building on their successes and avoiding at least their unsuccessful experiments. Then too, any current contributions to design are probably going to have to be more sophisticated than earlier ones which means that the amateur can delay his entry into design for a correspondingly longer time.

For those who are less experienced perhaps the best approach at the outset is to shop through the market-place of available designs - in the Year Books, magazines and newsletters - until you find one best suited to those personal characteristics such as temperment, morphology, body weight, hand-span and motor reflexes which constitute you, the hand launch glider flier. The final choice may be large or small, of high or low aspect ratio, have a little or a lot of dihedral - and it may take some building around to find it. But when you find one that rewards you with performance and consistency, when one out of the crowd speaks to you, stick with it, build it often, get to know it thoroughly, master it. When you begin to understand why it is suited to you, why it performs well, what its shortcomings are - and how you can improve it - you can profitably begin those experiments and modifications which we call design. And now to that.

The Wing

In powered aircraft the wing and power train assume greater or lesser importance in proportion to the power/weight ratio. As the ratio of power to weight increases the wing tends to assume less and less overall importance until at extremely high ratios, as in the case of a rocket, it is done away with entirely. Contrariwise, as the power to weight ratio diminishes the wing assumes ever greater importance until, as is the case with the non-powered glider, it becomes preeminent. The wing of the HLG then is unquestionably the most important single component and deserves the most careful attention.

From a general design standpoint we can state that the wing we want for the HLG will have an elliptical planform of the highest practical aspect ratio coupled with an airfoil section combining low drag (to permit maximum height on the launch) and high lift (to insure a low rate of sink in the glide). We'll take these factors one by one.

There seem to be very few home truths about wing design (or about any kind of design for that matter) but you will get few serious or responsible arguements against the aerodynamic and structural superiority of the wing with an elliptical planform. Structurally its superiority comes from the fact that its greatest cross-section, and therefore its greatest strength, is at the base chord where the greatest stresses are encountered; and nearer the tips where stresses are smaller, so is the cross-section. Then too, with construction factors equal, higher aspect ratio can be built into an elliptical planform. It also provides a bit of sweepback and tends to minimize tip losses, one of the most serious problems related to wing efficiency. Finally, by having the center of mass of the wing nearer the center of the aircraft the center of gravity is kept lower and inertial forces are reduced.

The main case against the elliptical planform, of course, is the difficulty encountered in construction. As a rule all sorts of odd sizes of ribs must be tapered and curved along geometric lines and you finally run up against covering cannily complex curves. In the case of the all-balsa HLG where we are not faced with these problems the zero-taper wing with rounded or elliptical tips remains very popular nonetheless.

There are a number of possible explanations for this. Laziness is one and another is the ignorance of how to carve such a wing. Still another is the reluctance of the builder to cut any further into a good piece of HLG wood than he has to. In light of the scarcity of really good wing stock and the distance it will sometimes go in the minor wheeling and dealing of the model builder's world this is not to be judged entirely as an act of cowardice. Nonetheless one excellent wing is worth several just good ones and the carving of the elliptical wing is not, as we will see, all that difficult.

Aspect Ratio

From a theoretical point of view the higher the A/R and finer the tips of any wing the higher its potential performance will be. In the second of his two articles on HLG in the January and February 1960 FLYING MODELS Stu Savage calculates a projected 42% increase in duration by increasing the A/R of a glider from 5 to 10:1; and theoretical L/D figures for some airfoils of infinite A/R go as high as 140/1 I'm told.

Against this projected superyield of high A/R, this tantalizing invitation to the glider builder in search of higher times, we must put a few substantial facts. The first problem that will come to most anybody's mind, particularly in the case of IHLG, is the structural one. The theoretician will give a thought or two to scale effect. Someone with practical experience in high A/R will wonder about the roll and recovery rates and the person whose experience includes building and flying high A/R IHLG may be eager to discuss a largely unspoken problem - already alluded to - in longitudinal instability.

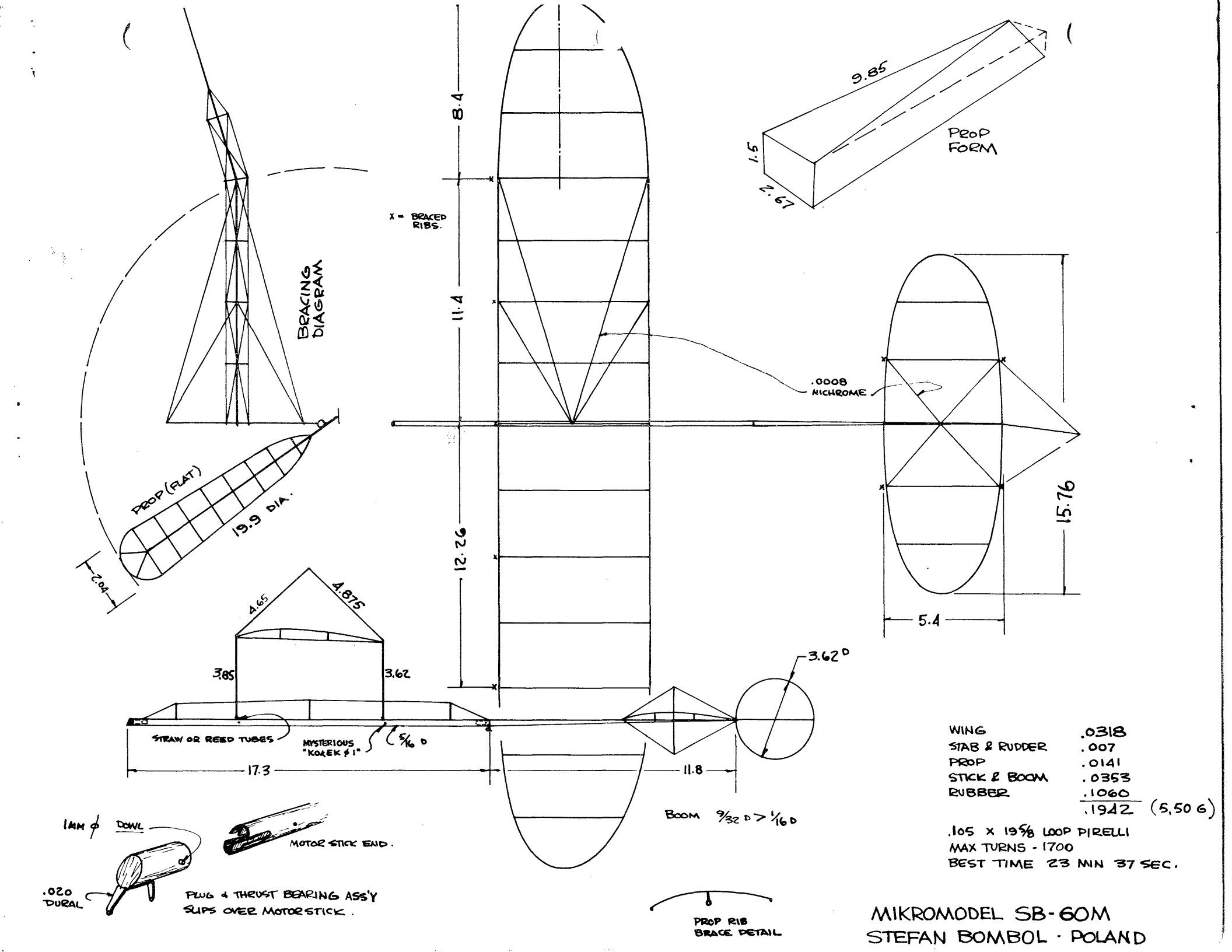
The High Hat

For a point of departure in discussing these problems let's take a look at Bob Hatschek's 10:1 A/R Hi Hat mentioned last month. We have a 1:2 ellipse with a base chord of 3" and a span of 24". The total area is 56.8 sq. in. and the airfoil thickness is 3/16". (See MAN for July '59 for more details and plan.)

Now if you're skeptical about the ability of a glider of these proportions to stay together when thrown by some of the best arms around I can't say that I blame you. The fact that the wings do stay on is a testimonial to the structural advantages of the elliptical planform, careful construction and tapered glue joints - and a practiced launch. It is also due in part to an easily overlooked plus factor, the fact that we can use increasingly heavier wood with incteased A/R. This is because the ratio of wing volume/wing area decreases as A/R increases. This means that a 50 sq. in. wing with an aspect ratio of 5:1 will have more wood than a wing of the same area but an A/R of 10:1. If I were a mathematician I'd be happy to include a chart showing the relationship of A/R to wing wood weight. However the fact that the Hi Hat wing is frequently made from 7 to 8 lb. stock will provide both an indication of the scale and a point of departure in building.

The few extra lbs./cu. ft. are quite significant but they by no means solve the strength problems definitively. Wings must be fashioned carefully from first-grade balsa, joints must be true and it is wise to taper the glue skins at the joints in order to assist in absorbing excessive loads. But we do know that a 10:1 A/R glider such as the Hi Hat will, even under unlimited ceiling conditions, stay together and that this is perhaps the least of the problems encountered in high A/R HLG. We also know that, despite a mean chord of slightly more than 2" and a very low gliding speed, the Hi Hat will (on occasion) fly so extra-ordinarily that we needn't break our heads over the scale effect business. It may, of course, complicate other problems we have, but by itself it doesn't seem to be a hazard.

(To be continued next month.)



WING	.0318
STAB & RUDDER	.007
PROP	.0141
STICK & BOOM	.0353
RUBBER	.1060
	.1942 (5.50 G)

.105 X 19 5/8 LOOP PIRELLI
MAX TURNS - 1700
BEST TIME 23 MIN 37 SEC.

MIKROMODEL SB-60M
STEFAN BOMBOL · POLAND

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." APRIL 1962

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

The month of March blew in (very hard in Texas) and left NIMAS with twelve new members for a total of seventy-six members as of April 1, 1962. We welcome these new members:

BOB CHAMPINE, 25 Beechwood Dr., Yorktown, Va.
ROBERT HARRISON, 1721 Tehoma, Oxnard, California
BILL HAUGHT, 1811 Hanford Rd., Baltimore 6, Md.
WILLIAM G. HULBERT, 174 Castle Blvd., Akron 13, Ohio
PAT McDONALD, 3539 "B" Street, Oxnard, California
JIM McGEE, Clinton, Ohio
DREW MORRIS, 25 Nassau Ave., Plainview, New York
MARVIN MOSS, 25 Union Ave., Maplewood, New Jersey
HAROLD REDNER, 19 Stephen St., Hazlett, New Jersey
FRED WEITZEL, 131½ Warburton Ave., Yonkers 2, New York
LAWRENCE WELLMAN, 8 Park Street, Groveland, Mass.
CHARLES YUSTER, 60 Woodland Ave., Great Kills, S.I.8, N.Y.

The return of NIMAS ballots has been a little slow, with less than half the ballots presently in hand and counted. Perhaps it is in order to point out that there is still a good chance that NIMAS will eventually have a more important role in rules revision than we now enjoy, but that a lack of response from our members can only hurt our chances to assume a more responsible role if and when the opportunity arises.

The reasonably unique make-up of NIMAS certainly is our most important qualification to assume the position of advising the Contest Board on indoor rules changes, and our strongest argument that we should be permitted an even more important role in the future. In theory our group represents the sport of indoor modelling to a very large degree, and NIMAS members hold at least 25% of the existing indoor records. If our present rate of growth holds, we will in fact be truly representative of our hobby - so we should follow through, demonstrating our interest and potential strength by making a 100% return of the ballots.

An interesting sidelight of the balloting was the large number of comments and suggestions also set forth by the voters. A summary of these comments will be in the May issue, some of these will probably stimulate a lot of discussion of our present rules system.

The general trend of the balloting has been to approve of three-flight scoring for IHLG and the addition of FAI as a new category; and disapproval of the Cliff Model Club IHLG proposal, the Skyscraper's IHLG proposal, the "solid stick" proposal and unlimited Class D area. Still "on the fence" so to speak, is the vote between the Wilmington IHLG proposal and Hatschek's alternate proposal. Some voters complicated the issue here by voting for both these proposals, very likely there would have a clear-cut count for one or the other if this had not happened.

Only a few comments have been received so far on the decal design as presented last month, but no adverse comments came up. This would tend to indicate a general approval of the design, but maybe some are waiting on the other design before making any comments.

Just before press time, Joe Bilgri has advised us of his new address: 1255 Blackfield Dr., Santa Clara, Calif.

****FAI INDOOR REPORT****

Local Elims

Moffet Field - April 15, 1962, Moffet Hangar
Joe Bilgri, 1255 Blackfield Dr., Santa Clara, Calif.
Los Angeles - April 21, 1962, Wilmington Rec. Center
Andrew Faykum, 9410 Dayton Way, Beverly Hills, Calif.
Cleveland - April 29, 1962, Central Armory, Cleveland
Chuck Tracy, c/o CLEVELAND PRESS, Cleveland 14, Ohio
Lakehurst - April 8, 1962 Lakehurst NAS, Hangar #6
Richard Miller, P. O. Box 27, New York 23, New York

Quarter Final Elims

Chicago - April 28, 1962, Madison Street Armory
Pete Sotich, 3851 W. 62nd Place, Chicago 29, Ill.
Dallas - April 29, 1092, Livestock Coliseum, Dallas
Bud Tenny, Box 545, Richardson, Texas
Moffet Field - May 6, 1962, Moffet Hangar
Joe Bilgri, 1255 Blackfield Dr., Santa Clara, Calif.
Detroit - May 6, 1962, State Fair Coliseum, Detroit
Dick Kowalski, 20203 Moenart, Detroit 34, Michigan
Los Angeles - May 19, 1962, Wilmington Rec. Center
Andrew Faykum, 9410 Dayton Way, Beverly Hills, Calif.
Lakehurst - May 6, 1962, Lakehurst NAS, Hangar #6
Richard Miller, P. O. Box 27, New York 23, New York

Semi-Final Elims

WEST COAST - June 3, 1962, Moffet Hangar
Joe Bilgri, 1255 Blackfield Dr., Santa Clara, Calif.
CENTRAL AREA - Tentative - June 2-3, 1962
Dick Kowalski, 20203 Moenart, Detroit 34, Michigan
EAST COAST - Tentative - June 3, 1962
Richard Miller, P. O. Box 27, New York 23, New York

For those who plan to fly in the Elims at Moffet Field, Joe Bilgri advises that he will have to be notified ten days in advance so he can furnish a list to the Navy, you won't be able to get on the field, otherwise!

FAI Indoor Results

This issue was delayed long enough to publish results from local elimination contests in Chicago, Kansas City, and Dallas; the May issue will contain the rest of the local elimination results and the results of the Chicago and Dallas Quarter-Final elims.

CHICAGO - March 31, 1962, 14 entries and 7 qualifiers.
Don Kintzele - 22:59.0 — Bob DeBatty - 21:07.2
Tommy Neumann - 22:45.7 — Vic Hotz - 20:03.2
Walter Mumper - 22:09.0 — Charles Sotich - 20:03.0
Art Christensen - 21:21.6

KANSAS CITY - April 1, 1962, 1 entry, 1 qualifier.
Walter Erbach - 8:23.4

DALLAS - April 7, 1962, 8 entries, 4 qualifiers
Bud Tenny - 13:41.7 — Terry Hamer - 10:22.8
Jim Clem - 10:46.2 — Jerry Murphy - 8:13.2

DETROIT - April 8, 1962, 10 entries, 5 qualifiers; times were not available on short notice, but will be printed next issue.
Phil Klintworth — Ed Stoll
Paul Crowley — Jim Baggi
Dick Kowalski

ANOTHER EDITORIAL

The response to our editorial of last month which took a strong stand for a completely self-financed FAI program was low, but the letters we received were very well thought out, regardless of which side of the fence they came from.

Unfortunately there is not enough space to quote any of these comments verbatim, and we would hesitate to use any part of such a letter, for fear of unfairly presenting a statement out of context.

AMA headquarters furnished the best argument we've seen for such a stand, in the form of the 1962 Rule Book. We refer to pages 50 thru 53, "BY-LAWS: ACADEMY OF MODEL AERONAUTICS. This section, a welcome-but-long-overdue addition to the Rule Book, outlines just what the AMA can and cannot do; and then outlines how these things shall be done.

Other pages that should be of extreme interest to all who would be an active member of AMA, and an effective member of AMA, are pages 42 and 49. In a manner of speaking, these pages should be of more importance to all members than the section on the rules.

A careful study of this information would have saved hundreds of hours of mis-directed energy that could have accomplished wonders in the proper channels, if the material had been available and heeded. Heretofore, groups of disgruntled AMA members have charged off in all sorts of campaigns to accomplish some desired end, only to come head-on with proper procedure requirements. Quite often, the desired end is achieved through proper channels, or is demonstrated to be an undesirable event and the "why" explained, but only after the delay caused by wrong procedures has occurred.

In short, the democratic machine which is our AMA may seem slow to act sometimes - but this is a valuable safeguard to our interests in the long run.

RECORDS? MAYBE!

Garland Aeromodelers Record Trials - March 11, 1962
CATEGORY I - 26' 4" ceiling. (Garland, Texas)
Senior B Paper Stick - 6:43, Richy Earle
Junior Autogyro - 0:13.2, Kent Britain

Chicago Aeronuts 5th Annual Indoor Contest - Feb. 24, 1962
CATEGORY II 75' Ceiling
Junior B Paper Stick - 11:44.5, Jim Skarzynski

Chicago Area FAI Indoor Eliminations - March 31, 1962
CATEGORY I - 22' Ceiling
Junior B Cabin - 5:08.4, Jim Skarzynski
Senior C Stick - 9:26.2. Dennis Kargol
Senior D Stick - 14:36.1, Tommy Neumann

CATEGORY II - 75' Ceiling
Junior B Stick - 8:39.8, Jim Skarzynski
Junior B Cabin - 7:15.0, Jim Skarzynski
Junior Autogyro - 0:17.8, Jim Skarzynski
Junior Helicopter - 3:44.0, Jim Skarzynski
Senior C Stick - 14:38.2, Dennis Kargol
Senior D Stick - 22:45.7, Tommy Neumann
Senior Helicopter - 1:50.4, Chad Krogh

Dallas Area FAI Indoor Eliminations - April 7, 1962
CATEGORY II - 55' 9" Ceiling (S. M. U. Coliseum)
Open Ornithopter - 1:58.4, Jerry Murphy

Recently, we received information from AMA Hq. on a newly-confirmed record:
CATEGORY I
Senior Helicopter - 2:06.7, Robert Michelson.

We have no info on where Robert hails from, but the record was set on December 30, 1961, which makes it likely that the flight was made in Seattle, Washington at the same site used by Phil Hainer for his 14:23.1 B Stick record (see plans page, and THE STATE OF THE ART).

As far as we've heard, Tommy Neumann's winning HLG flight at the 5th Annual Chicago Aeronuts Indoor Contest would be a new record, "if" it weren't for the fact that a mike HLG holds that record at 1:28.0. This flight was 1:09.4, a very impressive flight for that site.

In future letters, we would appreciate an indication from our readers whether they would like to see this column continued - usually the readers indicate a like or dislike for various features, but this one has drawn a blank. If there is interest, we will have to have more info from those who set the records - don't expect your CD to do it - he has lots to do already!

QUESTIONS AND ANSWERS

Although the following remarks by Lew Gitlow weren't specifically in answer to question 14, many of these comments fit in very well with that theme. Lew writes:

"Regarding low ceiling flying, I think the question very simply is this, "How can I get the highest times under a low ceiling?"

The main thing to keep in mind is that the weight of rubber used should be quite high relative to model weight. By using nothing under a 1:1 ratio of model to rubber weight, we can use the flat portion of the torque curve for a long cruise. However, it becomes a problem to harness this energy for CRUISE, rather than CLIMB. Here are a number of approaches to the problem:

1. Build rigid models. Light weight models under low ceilings gain little in the long run and will be demolished. Well thought out bracing costs little in weight, and adds rigidity. When a surface gives out under power, a wing tip especially, drag goes way up.

2. Make sure all surfaces are flat, and will stay that way.

3. Build props that flare out during the power burst. Keep the pitch to diameter ratio over 1.6:1 and as mentioned, allow props to flare out. Low pitch means a rocket climb.

4. Keep the flight circle tight - even to the point of torqueing in. This will keep climb down in the burst.

5. Build in extra area on the torque side of the wing as this will reduce torque effect without increasing the drag as much as extreme wash-in on the torque side of the wing.

6. Use wash-in on the torque side of the wing, starting with 3/32".

7. Try using a motor stick that will bow slightly under full power.

8. Try a C.G. location at 50% of wing chord. Model will hit the ceiling, stall down, and go up again.

9. Try coasting on the ceiling if it is not obstructed. A C.G. location at 40-45% of the wing chord will give instant recovery.

10. Try a stab with a flexible leading edge, and stiff trailing edge. Model will climb slowly under full power, and instantly pull out of a stall when the flex is just right, regardless of C.G. location.

11. Build one model - - - and lots of props.

12. Start winding the motor while walking out. Add about 40% of the total turns this way for higher ratio of cruise turns to descent turns. (Higher average torque)

All of these tips have their difficulties. One could go on and on with each technique. Some of these techniques, used in combinations with others, would result in models very tricky to fly. But, we are faced with a problem that requires much practice, and time devoted to experimentation."

THE STATE OF THE ART

In this column, like "RECORDS? MAYBE!", we will have to lean very heavily upon those who have set records and are willing to share the information with us. So, this column will last only so long as the information comes in - or it may appear on an irregular schedule as material is available.

There have been many people who have indicated strong interest in what should be flown in low ceiling sites - so we have almost two extremes in the two schools of thought represented below. We neither champion one way of flying over the other, nor express approval of either, we are merely reporting on these two schools of thought.

Each flyer has taken his own site, building time, and other factors into consideration; and each has advanced the state of the art by establishing a new record for the class he was flying.

Jim Kagawa is a senior aeronautical engineer for North American in Los Angeles, and a member of Wilmington Model Airplane Club. Jim holds two Category I records, according to the info we have; B Paper Stick - 11:35, and C Stick - 14:09. Both records were set at the Wilmington Recreation Hall, which is made available by the Los Angeles Recreation Department and has a 29' 11" ceiling. Speaking of his Paper Stick (plans on page five), Jim says:

"You asked for details on my paper stick model, but the design is so simple that I would hesitate to have it circulated. I nearly got laughed off the floor when I first appeared with it in November of 1960. The wing and stab looked like an enlarged version of Sotich's "Dinky Dip" and the prop was a single spar type with square tips Still, it was doing better than 10 minutes with surprising regularity and was once clocked at 11:20. I later added some circular tips to the wing and stab and tried a two-spar prop. It was with this configuration (94 sq. in. wing and 30% stab.) that I was able to squeeze an extra minute out of it."

"I built this model to see what a simple design would do in Category I paper stick, and for low ceiling flying I am convinced that elliptical and other "nice to look at" wing planforms are not necessary. Also, a rigid, fairly heavy model with adequate power will turn in consistently better times than a very light model that is tossed around the turbulent air of a Category I building. I am a firm believer in plenty of power in low ceiling flying, you just have to provide lots of thrust to enable the model to recover from collisions with ceiling and wall obstructions. A small turning radius is desirable. My paper stick has a turning radius of about 6 to 7½ feet - have you ever flown in a telephone booth?"

"What I have written may appear contrary to commonly accepted ideas about building and flying indoor models, but I think that this is the easiest approach when it comes to getting the most out of a Category I model, and for the present it is good enough for me. Later perhaps, when necessary, I will try some other approach."

Phil Hainer, designer of the "Bumper", the other one of our feature models this month, works for Boeing in the model shop of the Seattle plant. His approach to low-ceiling indoor flying represents almost an opposite to Jim Kagawa's technique - the ultra-light model. If we examine the plans of "Bumper", we note a weight of .0257 oz., with rubber weight of .024 oz. The record flight, in a 24' 9" ceiling, lasted 14:23.1 on 1300 turns spinning a 14 x 28 prop.

As a further definition of his low-ceiling philosophy, Phil says: "I'll give you what I think are good basic proportions for low ceiling ships:

Wing aspect ratio - 10/1
Stab Span - 40% of wing span
Motor stick - 43% of wing span
Tail moment - from 3 to 3½ times wing chord (measured from max. wing thickness to max. stab. thickness)
Prop diameter - from 50 to 55% of wing span with a P/D ratio of 2:1
Rudder area - 8%

The motor weight should about equal the airframe weight. These are things that come to mind and may not agree with anyone else's thinking, but they work for me."

Jim and Phil expressed, almost word-for-word, a basic philosophy for low ceiling flyers - "In Category I, you just have to keep trying!"

REPORT ON CHICAGO

In February your editor and Jim Clem were privileged to attend an indoor session at the Madison Street Armory - stomping grounds of the Chicago Aeronuts. Thanks to their excellent hospitality, we had a real ball. The Aeronuts even furnished us with models to fly - Charlie Sotich loaned us an unbraced paper stick model to fly, and Guy Negri gave us a glider to fly as long as the arm lasted.

It turned out that the glider was a test - sort of. All the real "arms" had flown this particular glider, including Richard Miller who had passed through the week before. Your editor had long realized that IHLG was a real art, but he found a new appreciation for that art after lacking about ten seconds in trying to equal times turned by that glider when flown by Miller and Tommy Neumann.

During the day we witnessed Tommy's fabulous arm-and Sweepette combo - including two flights of 1:04 and one of 1:06. As we were loading up the cars to leave, Tommy topped himself and got 1:08. Tommy will be one of the guys to watch at the Nats this year.

Our own specialty is rubber - so we spent most of the time with the rubber flyers. The Aeronuts, like all live-wire clubs, usually have a bit of good-natured banter going. The high-light of the day was the by-play between George Flemming and Charlie Sotich. It seems that George didn't have another motor and borrowed one from Charlie - then topped him with it! Charlie, usually high man for the day, could get only 14:20, and then George put up a flight over 16 minutes. Somehow, the word got around that the borrowed motor was one that Charlie had discarded and he was kidded unmercifully. All in fun, and really funny to hear as a spectator!

Tommy Neumann is also a rubber flyer - one of the few Aeronuts who fly all day long at the Armory sessions. His FAI ship is somewhat heavier than the average, and he has sometimes had trouble matching his motor to the varying weather conditions in the Armory. After some better-than-usual flights someone asked Tommy what his power was - he replied "One loop of .080 and two strands of golf ball!"

In a more serious vein - this visit inspired a search for data on the Aeronuts and other similar clubs. Unless we have overlooked something, the Aeronuts presently hold as many indoor records, both Category I & II, as any other single club. The Madison Street Armory, with a lecture room in Category I and the drill hall in Category II, is a real boon for this club, and they make full use of it.

We inspected the lecture room, site of Charlie's 15:20 Class D flight, and feel that this is a significant milestone in indoor flying. Only 22 feet of ceiling, and part of that is taken up by concrete beams which extend into the flight area. We hope to give a report on this model and flight soon, as space permits.

NEWS FROM AROUND THE WORLD

CANADA - TORONTO

From John Easton's AIRFOIL, we note that a little indoor activity happens occasionally, and we understand that an attempt will be made to paricipate in the FAI Indoor World Championships this year.

COLORADO - DENVER

The Martin Model Masters held their last scheduled indoor contest in March. Times increased about 15% over the first contest, which is the usual trend as groups begin to get used to a site and "in the groove".

George Batuik hopes to keep some flying sessions going for a while. If this happens, this group should set some records soon - they have a 33+' ceiling!

ILLINOIS - CHICAGO

Charlie Sotich reports that the last few Saturday Armory sessions have been getting so crowded that they plan to appeal to FAA for some type of traffic control!

At one time we heard that the Aeronuts may get another armory in Chicago for a summer season, after they lose the Madison Street Armory after the April 28 session. If they get another site, the Aeronuts will definitely be the club to beat at the Nats this summer!

INDIANA - KOKOMO

Chuck Borneman continues in his efforts to get indoor firmly under way in Indiana, and is holding the only regular organized indoor activity in that area. This results in attendance from all over the state for their meets at Bunker Hill Air Force Base.

For anyone within striking distance of that activity, you can contact Chuck at 1401 West Taylor, Kokomo, Ind. Drop him a line - he has a real live-wire group!

MISSOURI - KANSAS CITY

Now that Dick Black has moved from the Kansas City area, SLIPSTREAM has been taken over by the Kansas City Modelers Association and is edited by Bill Wright. Bill's efforts are aided by a staff of associate editors from clubs in the area.

Indoor activity in the Kansas City area seems to keep growing steadily under the combined efforts of Jim Dunkin, Tem Johnson, and Bernie Drummond.

NEW YORK - NEW YORK

Richard Millers last report on the armory was that the sessions have been a little shy of rubber flyers, but the glider flyers were hard at it. The ceiling was measured at 75' 6", placing the altitude in the same range as the Madison Street Armory in Chicago - maybe we'll have mail contests between these two clubs sometime?? Contact Richard at P. O. Box 27, New York 23 for dates of flying sessions in the armory.

Note to Junior flyers in the New York area - Walter Schroder, Editor of M.A.N., has put up a trophy toward an Easy B event for the Armory. Step right up and get your feet wet - boys, this is a lot of fun!

OHIO - CLINTON

Two letters in rapid succession from Jim McGee tell of a club sponsored by Goodyear that includes indoor activity in the planning, and of a flying session in the Goodyear Auditorium. This site has floor area equal to

about six basketball courts and a measured girder height of 33' 6", but he didn't say how much further it is to the roof. So it is either high Category I or low Category II - but they can use more flyers each session in either case. Contact Jim at Clinton, Ohio for more details and get into the swim.

VIRGINIA - YORKTOWN

The Newport News Armory has been the site of several indoor sessions, and Bob Champine reports that interest in indoor flying is growing slowly but steadily. As with most groups just starting low ceiling flying, the times were a little low, but are expected to pick up with more "stick time". Anyone in the Yorktown area can contact Bob at 25 Beechwood Drive, Yorktown, Va. for dates and times of more flying sessions.

****CREDITS****

In the last-minute rush to finish the March issue and cram the most pertinent information into the two pages remaining after the plans, glider article, and ballot, we cut out mention of the fact that Hardy Broderson handled the decal art work. Also, Hardy was too modest to sign the plans - so, we are indeed inbebted to Hardy for all his efforts in the last issue!

THE HAND LAUNCH GLIDER

PART FIVE by RICHARD MILLER

DESIGN (cont.)

High Aspect Ratio Problems

In continuing our considerations of the problems encountered with high A/R gliders we'll go kind of lightly over the height and roll out problems with the observations that, all other factors equal, the high A/R glider cannot be thrown to the altitude possible with a low A/R glider of similar area and that more careful adjustment will usually be necessary to assure a decent transition. However the greater duration yield of the higher A/R machine should more than make up for any small losses in the transition.

And thus we get down to the problem that separates the men from the boys, the tip stall. Now, as has been implied, when one of the good Hi-Hats settles down to glide it is inspiring. The tail sits low, speed slackens off, the wings rock with the slightest bit of air movement and the rate of sink drops to a point usually associated with ultra-light, highly undercambered low-ceiling IHLG. Unfortunately this is the sort of once-in-a-while phenomenon that has made the Hi-Hat essentially a one-man machine.

When the Hi-Hat doesn't make the grade (aghrrr!) it will dive ever so slightly in the glide; the increased velocity is immediately apparent to the practised eye. This curious shallow dive may last for as long as 15 or 20 seconds before, quite suddenly, there is an abrupt stall followed by a quick drop of the inside wing tip. This will be followed by another extended period of dive and another abrupt stall. The addition of a shade of weight will result in an unrelieved dive - and a very short flight - while the removal of any clay, no matter how little, will simply cause the stall to appear sooner.

Experiments - and a Solution

When I built my first Hi-Hats, naively expecting the exquisite performance I'd seen from Hatschek's machines, I got what I've described above - and miserable duration. I tried everything I could think of to remedy the quirk. I used larger and smaller stabs, lifting and symmetrical sections, larger rudders, more dihedral, turbulators, and toe-out at the polyhedral breaks - plus frantic letters to Goldberg, Blanchard, and Ritz.

Finally, after more months of experimentation, conversation and correspondence than I'd care to admit, the probable cause became blindingly obvious to me. The Hi-Hat has three features which induce tip stall: high A/R, taper, and generous polyhedral. Combined, they reenforce one another. Add to that the low Reynold's number and the scale effect of a 1½" tip chord and is it any wonder that there was an instability problem?

When I had gotten, toward the end of my experiments, to the point of toeing-out the polyhedral joints (to get wash-out in the outer panels) I was getting close to home. But the matter was even simpler than that: all that was necessary was to carve the desired amount of washout into the wing blank before shaping the airfoil! At this point the solution seemed so plastically simple that I could have kicked myself twice around hangar #6, Lakehurst NAS, in chagrined retrospect for struggling so long with something so obvious.

As far as washed-out tips go then (even to the extremes of 3-5°) I would like to follow some tentative observations with some very optimistic, but not necessarily accurate assumptions:

1. From the standpoint of glide performance alone, washed-out tips seem definitely desirable on medium to high A/R gliders and are probably benefificial, in lesser amounts, on low A/R machines;

2. At higher speeds excessive washout will unquestionably cause drag and prove a structural liability. (Certain sailplanes incorporating washed-out tips seem to have a definite performance advantage in thermal flight but are slowed down on cross-country hops between thermals due to the downward deflection of the wing tips - caused by the wash-out.);

3. When a HLG with a 0° wash wing is thrown at launch speeds there is a tendency, due to the lifting action of the section, for the wings to fold up and back. A wing with excessive wash-out would tend to fold down and back;

4. There is a point (and this is where the optimism begins) between these two tendencies, say 2-3° of wash-out, where the down and back shear will somewhat neutralize the up and back break load, yet create no special problems of its own;

5. (Most optimistic of all) At some happy point the wash-out will tend to reduce stress loads and drag losses in the wing during the launch and be, in addition, highly advantageous to the glide-flight of the machine.

It seems likely that wash-out is going to have a definite relationship to A/R; they will increase numerically together. On the other hand wash-out, due to the down and back break load would seem to have a definite limit, perhaps 5°, perhaps more. Finally then, incorporating wash-out in proportion to A/R would force an upper limit on A/R, say on the order of 7 or 8:1.

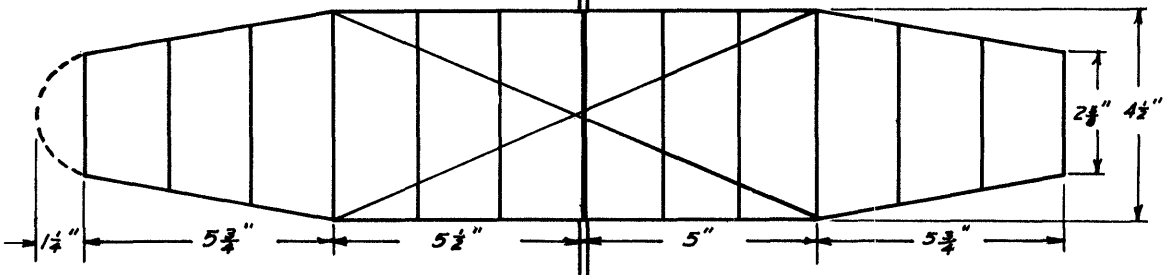
So much for theory. Does it work? My first experience with a 7:1 A/R glider which was hopeless (tip stall) last year indicate that 2° degrees of wash-out carved into the tips has done the trick - although one glider doesn't make a season. It is also worth noting that just about the most successful design around these days, the Sweepette, employs varying amounts of tip wash-out in different versions. It has also been my observation that, perhaps due to the unique planform, the Sweepette tends to acquire wash-out even when it isn't carved or sanded in. This could account in some measure for its remarkable successes.

And this brings us, as neatly as anything could, to wing planforms other than the elliptical and to sweepback. The big pitch we made earlier should definitely be tempered by mention of the parabola (a sort of fat ellipse), the reversed ellipse ("Hey mister, your wing's on backwards!") and sweepback. They all have been used many times of course.

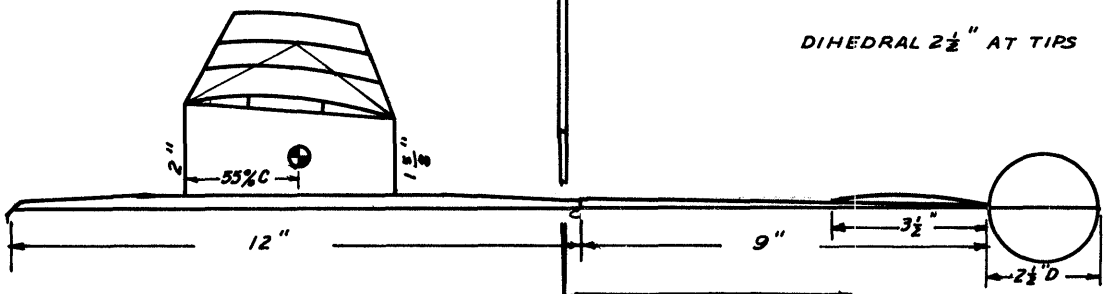
The stabilizing effects of sweepback, and the fact that it can permit a reduction in dihedral, have long been noted. Whether, or in what part, this contributes to the success of the Sweepette it would be nice to know. That the glider is successful is beyond arguement. Most people who have tried it, according to Lee Hines, the designer, have seen their indoor times go up about 10%. A quick look around seems to substantiate this. Ron Wittman won the Nats (1:14.5) with one; Otto Heithecker, using a modification, established the current Category II Open record (1:15.0) and Jim Baggi used Otto's version to take Jr. IHLG at the Nats (1:07.2). Tommy Neumann of Chicago has done an incredible 1:09.4 under the 75' ceiling in the Madison Street Armory. Lee himself has done 0:37.0 with a low-ceiling version under a 29' 11" ceiling, 0:51.8 under 45' and 1:16.2 at Moffet recently. Times like these can leave little doubt as to the quality of the design.

PROP DIAMETER 13¾"
2 SPAR PROP P/D = 1.8
16 IN. LOOP .085 PIRELLI

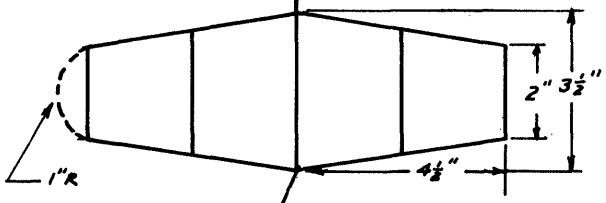
PAPER STICK CATEGORY I MODEL
DESIGNED BY JIM KAGAWA
BEST TIME 11 MIN 35 SEC 25 FT. 11 IN. CEILING
WT. .06 OZ LESS RUBBER



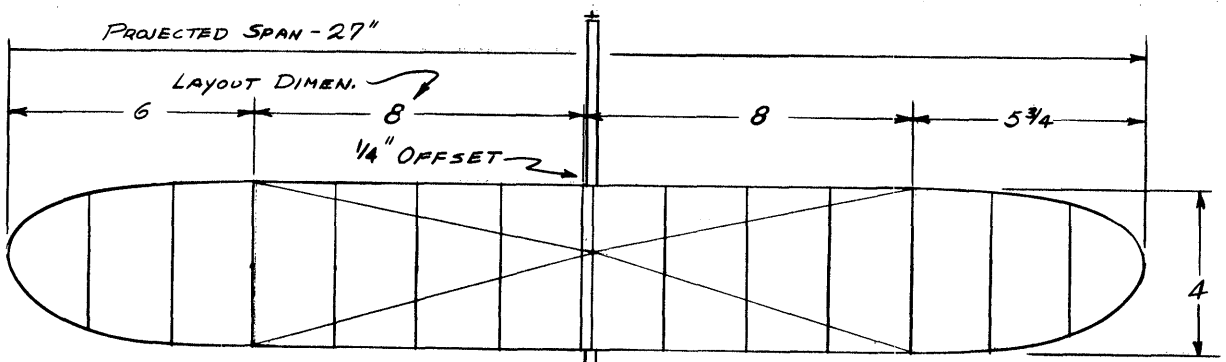
DIHEDRAL 2½" AT TIPS



ORIGINAL TIPS SQUARE
ROUND TIPS ADDED LATER

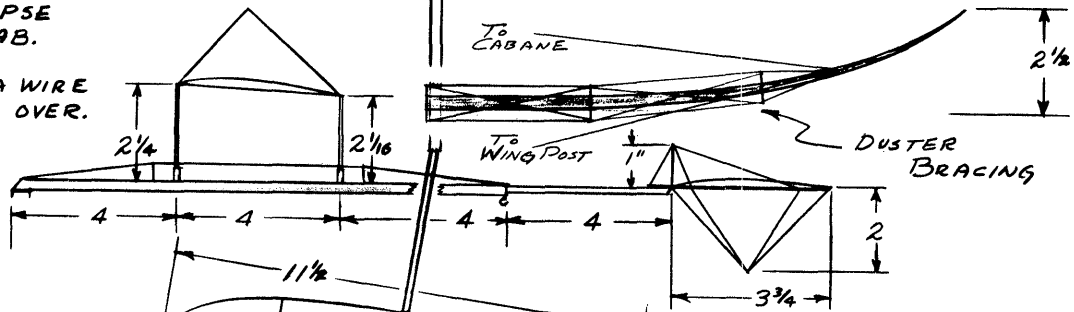


LEE POLANSKY



40-60 ELLIPSE
WING & STAB.

.0007" KARMA WIRE
BRACING ALL OVER.



WEIGHTS:
FUSE. - .0100
WING - .0060
TAIL - .0030
PROP. - .0050
BRACING & STRUTS .0017
.0257 OZ.

MOTOR - .043 x .050 x 13" (.024 OZ)
1300 TURNS @ RECORD ATT.
PROP. - 14" D. x 28" PITCH - MONOSPAR
DESIGNED & FLOWN by PHIL HAINER - KENT, WASH.

"BUMPER"

CLASS B STICK - 99.65 SQ. IN.
CATEGORY I - 14 min. 23.1 sec.
12-30-61
CEILING - 24' 9" Geo. Batiuk

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." MAY 1962

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

NIMAS membership increased by seven during the month of April, for a total of eighty-three. The names and addresses of the six regular members and one honorary member who joined last month are:

DAVE BALES, 1511 Hollywood Way, Apt. C, Burbank, Calif.
AL CARLSON, 10129 Brockbank Dr., Dallas 29, Texas
JACK DANIELS, Box 451, Oak Lawn, Illinois
FRED PEARCE, Dynamics Branch, NASA, MSC, Rich Bldg., Telephone Rd., Houston, Texas
JIM SKARZYNSKI, 3800 N. Odell Avenue, Chicago 34, Ill.
RON WITTMAN, 200 West First St., San Angelo, Texas

DEVON SUTCLIFFE, 21 Burwood Rd., Matamata, Waikato, New Zealand

A final tally of the NIMAS Ballots that have been returned showed a total of thirty-four ballots cast from about eighty possible. This is just over 40% returns, and just a little disappointing. Only time will tell just how important the results to follow really are, but NIMAS could only gain from having had a larger return.

I. Wilmington-Detroit-Chicago PROPOSAL A (IHLG design)
18 for, 15 against, 1 no vote
II. Wilmington-Detroit-Chicago PROPOSAL B (IHLG scoring)
21 for, 12 against, 1 no vote
III. Wilmington-Detroit-Chicago PROPOSAL C (FAI Indoor)
28 for, 6 against
IV. Cliff Model Club IHLG Proposal
5 for, 28 against, 1 no vote
V. Skyscraper's IHLG Proposal
4 for, 29 against, 1 no vote
VI. Hatschek's Alternate IHLG Proposal
11 for, 14 against, 9 no vote
VII. Solid Stick Proposal
8 for, 25 against, 1 no vote
VIII. Unlimited D Stick
6 for, 23 against, 5 no vote

About the time the ballot was issued, developments on the various IHLG proposals were moving far too fast for even the short deadline of INDOOR NEWS to keep up with, with the result that only the very earliest ballot returns had any chance to affect the outcome. At last word, Bob Hatschek indicated that the Contest Board had given sufficient support to his proposal for it to enter study, at the same time he requested comment on another alternate proposal that defined the flight of IHLG, specifically, that the glider would gain the major portion of its flight altitude from the launch. This would probably be effective in ruling out long thermal flights of "mike" gliders, by negating flights which gained significant altitude from saoring. Since the above mentioned bulletin, there has been no further word on the status of any rules proposals.

To comment briefly on the ballot questions other than those on IHLG, we can note the following:

II. This vote shows a majority of NIMAS members favor a three-flight total for scoring IHLG, which should be a strong factor for the Contest Board to consider.

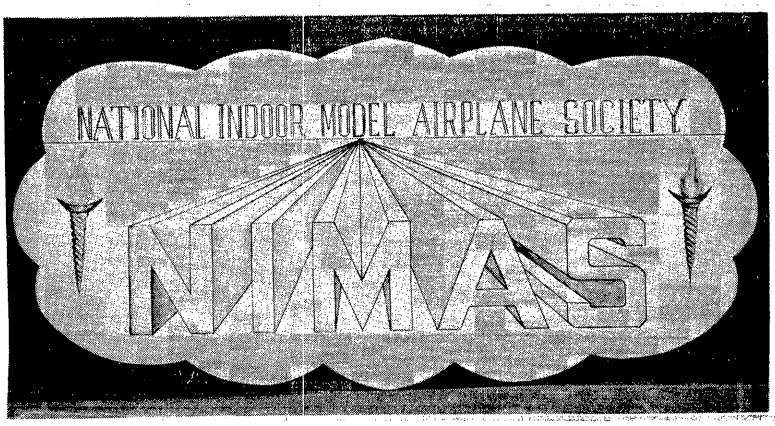
III. An overwhelming majority for adding the FAI Indoor model to existing categories of indoor models. We believe that both II and III are in the study period; they should pass in time for the 1963 Rule Book.

VII. This vote should result in final rejection of the Solid Stick proposal, which would be most desirable from our own viewpoint.

II. Since VIII was sort of an opinion poll to determine if NIMAS should originate such a proposal, unlimited wing area for Class D obviously is considered undesirable.

Final Decal Sketches

In addition to the decal sketch published in the March issue, we have these two other suggestions:



The first decal suggestion was made by Fred Weitzel, with the art work by Hardy Broderson. The background is light blue, the HLG and mike ship (we hope they show up) are white, the border and lettering are black.

The last suggestion comes from Ron Wittman, who also did the art work. The coloring is mostly pastel shades, with light blue front on the letters and pale red shadow. Ron also submitted about a dozen variations on this theme to show adaptation to patches, FAI Indoor team emblems, and other uses.

In order to make it possible to have the decals by Nats time, each NIMAS member should drop a card to INAV indicating his choice not later than May 25. Even sooner would be better, as time is growing short. You have no gripes coming if you keep silent!

Rules Suggestions

Along with the ballots the members sent rules comments and suggestions. Most of them dealt with items on the ballot, but some were new concepts of rules sent in for comment.

To consider the rule book as a whole, we have a large number of events governed by complex rules. In our humble opinion, when all of our rule book attains the beautiful simplicity exhibited by the rules for FAI Indoor Rubber, we will have "arrived". Every time an attempt is made to legislate the structural constitution of a model, such as the Solid Stick proposal, or the precise design considerations, as in Team Racing, the result is a complicated rule. Such a rule will have enough loopholes so as to prevent efficient administration except by the group that conceived the rules, or it will require a legal education to interpret the meaning.

In other words, that which has been conceived by the mind of man can be circumvented by the mind of man - all it takes is a little time and effort. It is unfortunate that our society contains those few who make a game or a life philosophy of circumventing the rules.

All of which was a windy introduction to the following two suggestion that would simplify our rules - maybe there are other ideas to do the same??? Hardy Broderson suggests: Explore the approach that in each category of ceiling heights the modeler be allowed complete design freedom for the best time under that ceiling in "mike" and paper - both cabin and stick." And Bob Champine says, "I would greatly prefer to see all rules changed to drop the wing area rules and substitute wing span requirements which are much easier to process."

If either of the above rules suggestions tickles your fancy or arouses your ire, let your feelings be known. Or if you have a rules suggestion, send it in. Now is the time to start on rules for 1964 - if we make good changes. At the same time, let's avoid rules changes for the sake of changing something - the ballot poll also brought many comments that indicated both a satisfaction with the time honored events we now have, and the rules for them.

****FAI INDOOR REPORT****

Quarter Final Elims

Moffet Field - May 6, 1962, Moffet Hangar
Joe Bilgri, 1255 Blackfield Dr., Santa Clara, Calif.
Detroit - May 6, 1962, State Fair Coliseum, Detroit
Dick Kowalski, 20203 Moenart, Detroit 34, Michigan
Los Angeles - May 19, 1962, Wilmington Rec. Center
Andrew Faykum, 9410 Dayton Way, Beverly Hills, Calif.
Lakehurst - May 6, 1962, Lakehurst NAS
Richard Miller, P.O. Box 27, New York 23, New York

Semi-Final Elims

WEST COAST - June 3, 1962, Moffet Hangar
Joe Bilgri, 1255 Blackfield Dr., Santa Clara, Calif.
CENTRAL AREA June 2-3, 1962, State Fair Coliseum, Detroit
Dick Kowalski, 20203 Moenart, Detroit 34, Michigan
EAST COAST - June 3, 1962 - Tentative
Richard Miller, P.O. Box 27, New York 23, New York

FAI Indoor Results

Local Elims

DETROIT - April 8, 1962, 10 entries, 5 qualifiers
Paul Crowley - 23:08 — Ed Stoll - 21:09
Dick Kowalski - 22:05 — Jim Baggi - 19:30
Phil Klintworth - 21:55

LOS ANGELES - April 13, 1962, 5 qualifiers, times not available.
B. Paton — Tom Finch
Frank Cummings — Lew Gitlow
Carl Redlin

MOFFET FIELD - April 15, 1962, 13 entries, 7 qualifiers
M. Andrade - 32:19 — Hal Cover - 26:59
Joe Bilgri - 30:40 — Phil Hainer - 25:13
Hu Entrop - 30:03 — W. Williams - 23:01
B. Atwood - 27:07

LAKEHURST - April 8, 1962, 9 entries, 5 qualifiers
Ray Harlan - 26:39.6 — Bill Bigge - 14:37.2
Jim Grant - 25:16.2 — Ernest Kopecky - 14:32.0
John Triolo - 24:00.0

NEW YORK CITY - April 17, 1962 7 entries, 4 qualifiers
C. V. Russo - 15:25.0 — Drew Morris - 10:54.6
Julius Rudy - 12:55.0 — E. Franklin - 10:06.0

Quarter Final Elims

DALLAS - April 29, 1962, 5 entries, 4 qualifiers
Jim Clem - 15:26.5, 16:57.1; 32:23.6
Stan Chilton - 12:53.4, 15:33.9; 28:27.3
Terry Hamer - 10:50.4, 11:41.6; 22:32.0
Bud Tenny - 8:22.2, 11:43.6; 19:33.4
CHICAGO - Postponed until May 12, 1962 by circumstances beyond control of CD. Contact Pete Sotich, 3851 West 62nd Place, Chicago 29, Illinois, RE 5-1353

****"THE EASY I"****

Recently we had the good fortune and pleasure to meet Ron Wittman for the first time. Naturally, there was a long bull session about people, places and models. Then, Ron asked "Is there a need for a "fun model" type of HLG?"

This sounded like such a good idea that we said, "Have you got one?". He didn't have one then, but a week later there was one - the "Easy I". Here's the story:

"The Easy I"
by Ron Wittman

The "Easy I" was designed primarily to create more interest in Low Ceiling glider flying. The idea was to have a glider that was easily built and still have high performance. The "Easy I" takes but a couple of hours to build but trims out easily.

Monthly contests for the "Easy I" along with the "Easy B" rubber powered model should make for fun-filled indoor sessions.

Construction

First, the selection of wood is of great importance. Choose the wood carefully, keeping in mind that you want a glider that is light and will reach the ceiling without breaking under the force of the launch. Also it should not be able to go over that height very much, even with an all-out effort in the launch. This will give you the right glider for that ceiling.

Fuselage

The fuselage can be made from strong, light 1/16" or 3/32" sheet. Draw the outline shown on the plans including the undercamber curve right on the wood. Cut it out and sand it smooth.

Tail Surfaces

The stab and rudder are made from light quarter grained 1/32" sheet. Cut the stab out and draw the center line on the top. Sand the leading and trailing edges as thin as possible without causing warpage or danger of breakage, leaving the center portion at 1/32" thickness. Make a cut along the center line of the stab approximately 3/4 of the thickness deep all the way across the stab. Cement in the anhedral shown and let dry. Cut the rudder to the shape shown and sand it thin like the stab. Cement the rudder to the fuselage first, then the stab.

Wing

The wing should be made from 1/16" sheet balsa, quarter grained and as light as possible. Mark off 16" on a 4" wide piece of wood, then mark off the center line of the wing. Cut the sheet to the wing outline shown and sand an airfoil section with the high point at 30%. After the airfoil has been sanded in, cut the wing in half. Cement it to the fuselage, adding the dihedral as shown.

Finish

After sanding all the components to shape the next step is to get them as smooth as possible. This can be done by using #600 wet or dry sandpaper and then #1000 polishing paper. Sand lightly with the #600 until the wood feels smooth, using fairly worn out paper. Then polish the wood with the #1000 until it shines. If you can't get #1000, use the back of the #600. After this has been completed, the parts are ready to be cemented together.

Flying

Balance the model at approximately 60% of the chord from the leading edge. Hand glide the model, if it dives with no sign of pulling the nose up (indicating negative incidence), warp the trailing edge of the stab up until a smooth glide is obtained. If the model stalls, warp the trailing edge of the stab down. Get as close as possible to zero incidence, with a barely noticeable positive angle.

Now adjust for turn, either left or right. For left turn warp the trailing edge down, thus creating wash-in. In the glide this will create drag and force a left turn. The turn can also be increased by tilting the stab and by warping the left stab trailing edge up and the right edge down. Above all, don't give up until you get the results you want. The more you try, the better your adjusting techniques will become.

THE HAND LAUNCH GLIDER

PART SIX — by RICHARD MILLER

DESIGN (cont.)

The Airfoil

Any history of the development of the IHLG will have to record Mr. Reynolds as a man who invented a naughty number which, when it was high was worth spending a big part of the R & D budget on (because everybody, at least everybody who's civilized, wants to get there yesterday) and when it was low managed only to become the subject of an occasional report which had very little to do with how

QUESTIONS AND ANSWERS

During the past month Ray Harlan and Ted Gonzoph were asked to air their views on Question 13 (presented in the March issue and repeated here) and Question 16. We have several comments on drift control (Question 15) but there wasn't enough time left over at the end of FAI Indoor to work it up. There is still room for any basic comments on how to control drift - anyone???

13. What determines the height of the wing struts? What effect does change of wing height have?
16. What determines how much dihedral should be used? In your opinion what is the most practical type of dihedral (ease of construction vs. efficiency)?

Ted Gonzoph says:

"I cannot give you a single, definite formula for determining wing height, since different models have different characteristics. Checking some old notes on previous models, I found the following percentages worked well:

A ROG - 25% of prop diameter
B Paper - 20% of prop diameter
C & D film - from 15 to 18% of prop diameter

Some modelers may present wing height figures based on wing span, but I feel that the problem is more directly related to the prop diameter than to wing span.

Now, lowering the wing position tends to make the model spirally unstable in a tight turn-full power condition. Opening the turn or more dihedral will generally help. Raising the wing induces a looping tendency under full power, necessitating down thrust. A secondary, less noticed effect is for the model to want to fly straight ahead under full power. More rudder area will aid in keeping the model in its turn.

Incidentally, the high wing position should be given some consideration with the upcoming solid stick paper models. It could be used to control or minimize the diving tendencies those solid, bending sticks will have."

"Dihedral is another variable, dependent on model type and flying speed. To generalize:

A ROG - 1½" per foot of span
B Paper - 1¼" per foot of span
C & D Film - 1" per foot of span

V Dihedral - very easy to build and brace, but spiral dives easily.
Polyhedral - my personal preferance. The flat center section is easy to brace and the "Nordic" tip (I generally use a tip of about 20% span) gives good control in tight turns and under high power.
Polydihedral - just a little more work to get the same results as polyhedral.
Elliptical - after Hacklinger, what can I say? However, unless used generously, it tends to drift and the slightest air disturbance will make it roll out of the turn pattern."

Ray Harlan commented on #16:

"After thumbing through Perkins and Hage's "Aircraft Performance, Stability and Control", I've come to the conclusion that this question is not worth considering analytically to any great extent. However, the dihedral effects can be summed up from two extremes to essentially justify "using what everybody has used for years". First, dihedral creates a force unbalance resulting in a rolling moment when the model is sideslipping in such a way as to negate spiralling tendencies. On the other side of the fence, too much dihedral reduced the damping of lateral oscillations (through shortening the period of oscillation) so that the model would exhibit prolonged responses to small disturbances and probably would be very subject to being disturbed by propeller unbalances (weight and/or pitch).

With these extremes in mind, the best answer is to use that which seems to work. I prefer plain tip dihedral (with my tips taking about 44% of the span) of about 20 to 25 degrees. It is certainly the simplest to build and is just as effective as any more elaborate schemes - to achieve adequate lateral damping.

One additional dihedral effect is the creation of vortices at the dihedral joint due to airflow disturbances. This is a form of induced drag, whose magnitude is difficult to measure. I would question the worth of avoiding dihedral joints on the grounds of trying to reduce this drag."

RECORDS? MAYBE!

One of the things we have watched since the inception of this column has been the accuracy of the information as presented - judged by the number of listings that are finally confirmed. Confirmation information comes from three sources - official AMA publications, and letters from either the CD or the record holder. So far, we have been confirmed on over 70% of the times, and some listings in the April issue are just too new to be confirmed yet.

Another important consideration will be just how many we miss - and that depends upon our readers to furnish the information. As it now stands, this column will stay in print so long as there are reports coming in in time to serve a useful purpose.

The large listing last month sort of took the wind out of our sails this month, and there have been no reports of high times since those listings.

NEWS FROM AROUND THE WORLD

CALIFORNIA - SANTA CLARA

Reports from Joe Bilgri and Lew Gitlow on the Moffet FAI local elims made interesting reading. Besides the high qualifying times (page two), Carl Redlin posted 36:50 for high time of the day, followed by Lew Gitlow's flight of 34:42 with a brand new "C". Tom Finch turned 30:22 with a "C" - in fact, all those who qualified at Wilmington were out in force for a day of test flying, making use of the first opportunity this Spring to fly in Moffet.

ENGLAND - COVENTRY

Arthur Barr reports that two situations marred the first indoor session in Cardington - some misunderstanding about dates made it difficult to get on station the first Saturday, and the repairs to the shed weren't complete as had been reported. With a real gale outside the shed conditions were very rough inside - Ron Draper lost a ship to drafts while handling it!

Arthur and Ron Draper have been testing some different batches of Pirelli, and found it to be like wine - better some years than others. The best vintage was 1960, with 1962 and 1958 very poor, and 1959 was pretty good.

NEW YORK - NEW YORK

Activity in the new Armory has been slowly increasing, especially since C. V. Russo proved that 15 minutes was possible during the FAI local elims there. In fact, he proved it three times and got the model back each time!

NEW ZEALAND - UPPER HUTT

John Malkin is making an all out effort to boost the indoor activity in New Zealand, along with all his other interests. The latest issue of the Upper Hutt Aeromodellers Bulletin has an article by John with good tips on getting started, locating sites, getting supplies, and general cheering on of the timid. With such enthusiasm things should be jumping there soon.

OHIO - CLINTON

Although the attendance is still poor at the indoor sessions in Goodyear Auditorium, Jim McGee reports the rubber times to be climbing up to around 8 minutes with many hang-ups. Jim is presently top dog in glider with flights ranging around 0:37 (43' ceiling but 33' 6" to the bottom of a maze of rafters and wire) and a top of 0:37.4. With Jim's guidance, the other flyers are rapidly catching up with flights up to 0:31.5.

TEXAS - DALLAS

The FAI local elims and the quarter finals marked the end of the formal indoor contests in this area, but on May 4 the Walnut Hill site opened up for regular sessions until basketball starts up again next Fall.

The attendance was small the first evening, but rubber times were over 7 minutes for both Senior and Open fliers. The real news was that IHLG was permitted on a scheduled basis for the first time. Although the plans for the Easy I (see story and plans this issue) had been out less than 36 hours, this glider dominated the HLG session. Flown by Terry Hamer, the Easy I now holds the building record of 0:16.0 (20' ceiling). The next sessions should really be crowded, considering the enthusiasm generated this time.

TEXAS - HOUSTON

Letters from Warren Gillespie and Fred Pearce tell of several members of the Brainbusters, including Frank Parmenter, have moved from Virginia to the NASA facility in Houston. Indoor activity in Texas will take a big jump if these boys can get started in Houston.

"EASY I"

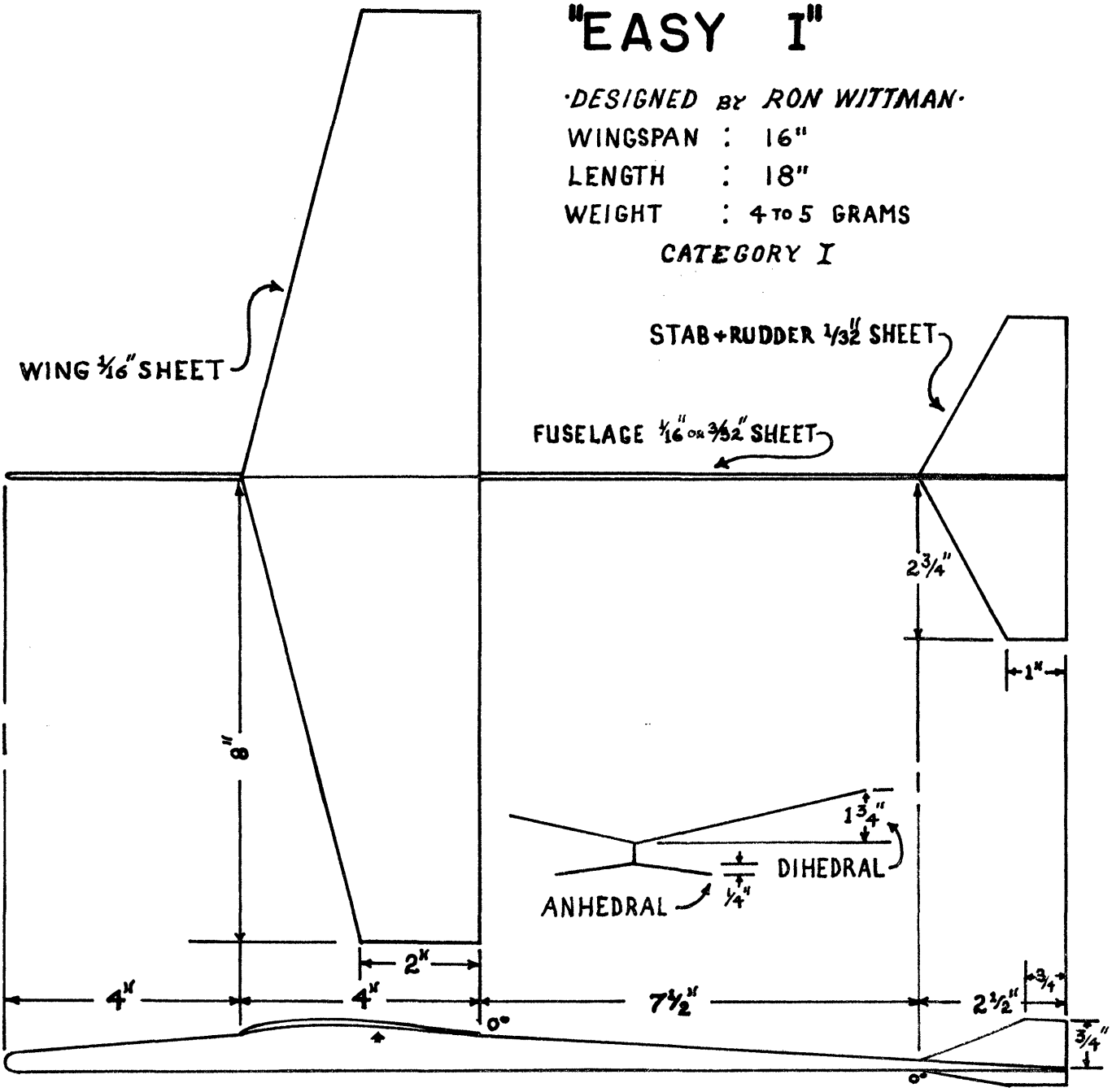
·DESIGNED BY RON WITTMAN·

WINGSPAN : 16"

LENGTH : 18"

WEIGHT : 4 TO 5 GRAMS

CATEGORY I



ADDITIONAL NOTES:

1. Maximum wing undercamber 3/32" at 30% of chord.
2. Fuselage depth at wing 3/4".
3. Extra light gliders may use up to 1/32" less undercamber.

effortlessly a HLG goes up nor how reluctantly it comes down.

Nonetheless, despite this serious oversight on the part of Theoretical Science, we are far from ignorant about the effects of low, or even ultra-low, R/N airflow. There is a far from meager fund of experience related to thin and thick sections; sharp and blunt leading edges; forward, middle, and rearward high points; laminar and turbulent airflow and their combinations. In a sense every glider ever built and flown has been a small contribution to a vast, pragmatic research project aimed, to paraphrase a loquacious linguist, in determining the statistical regularity with which the permitted combinations of the constituent elements - within the pattern of the particular configuration - recur and can be classified in terms of formulae which are concerned with the classical probability of increased performance; i.e., duration. In Short, some airfoils work better than others. And some don't work as well, although a flat plate will maintain a HLG in a fashion. Thus, in our concern with the individual model builder's realization of the specific form that aerodynamicists have given to Bernouli's application of Venturi's principle (that an increase in the velocity of a mass of air causes a reduction in its pressure) we would do well to take a look at what has been tried and how well it has worked.

Section Thickness

The choice of the thick, highly undercambered airfoil sections which pretty well dominated general model building fifteen or twenty years ago seem to have been dictated by the feeling that if a little camber produced a little lift a lot of camber would produce more. This assumption, which made sections such as the RAF 32 and Eiffel 400 so popular in those days was probably pretty close to correct. What was equally correct, but overlooked, was that an increase in camber and an increase in lift was also accompanied by an increase in drag.

Perhaps it was due to the fact that this drag penalty was so immediately evident in the HLG that caused glider throwers to stich to relatively thin sections. Nonetheless the existance of the 1/4" X 4" plank (and the mistaken idea that one had to use the lightest wood available for glider wings) tended to do to the HLG wing what the 36" strip did to the span of the ½A gas model for years. The 1/4" X 4" plank gives a section thickness of just over 6%. Just what the ideal thickness is is dependent, of course, on a number of related factors and cannot be stated categorically. My own experience and observations indicated that somewhat thinner sections, ranging from about 4 to 5% of the chord, give better results, at least for unlimited ceiling flying. (And remember that wood weight can increase in proportion as the wing is thinned down; and that heavier wood is both more resilient and takes a higher finish.)

With all other factors equal the highly cambered, high lift-high drag sections do improve glide speed rate-of-sink. It is under increased thrust that they become wasteful and the reason for avoiding them, of course, is in order to get maximum height under unlimited ceilings. Under lower ceilings, where we have a surplus of power in our arm to ceiling height ratio. we can increase the airfoil thickness somewhat and the undercamber radically, or until it takes all the strength we have to get a .3 oz. glider up 30'. And this exercise provides an excellent lesson in how much energy a little camber in an airfoil can absorb.

High Point

In the general uncertainty that surrounds the selection of which airfoil to use the specific case of just where to put the high point of the upper camber can well represent the quandry of the designer. The extreme limits seem to be about 20% to 40% with something close to 30% being most popular. Wally Simmers seems to feel that a 40% high point is worth experimenting with principally as a means of decreasing drag - and it is interesting to note that Hacklinger used a 40% high point on his 44:20 mike job. At least according to 7 out of 10 reports he did.

Leading Edge Radius & Entry Point

Things are somewhat more definite in regards to the leading edge radius. There is fairly wide feeling in favor of sharp leading edges and about .05% (or a diameter of about 1%) would seem to be a good place to start. This is one factor which can be controlled carefully by the use of various sizes of wire or monifiliment. (Another version of the sharp L.E. is the 1/8" X 1/32" L.E. wedge strip which Stu Savage used to cure one of his high aspect ratio designs.)

In the interests of reducing drag (once again) there seems to be some justice in having a shade of upsweep of the lower camber at the leading edge, or a slightly raised entry point. Lee Hines recommends using 1/16" on his Glidette and I use about 1/32" on wings having the same thickness as the Glidette, namely 7/32".

Undercamber

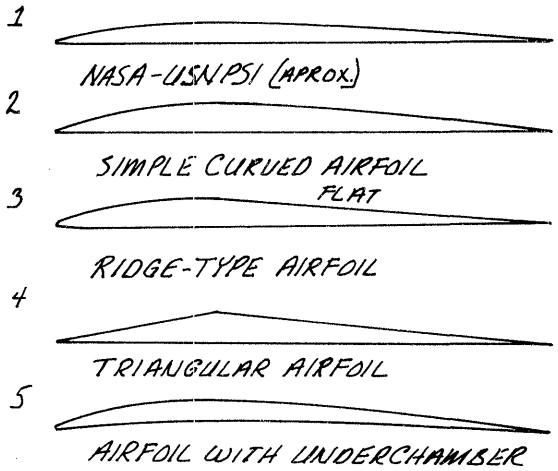
Undercamber is, as inferred earlier, a must for low ceiling gliders and a little may be in order even for the unlimited ceiling glider. The old RAF 32 type of undercamber of past years seems to have given way to the full chord style and the amount is simply all you can carve in and still get the glider to within a couple of inches of the bottom girder.

If you've read this far and have the feeling that you're very little wiser than before I can't say I blame you. What makes airfoil characteristics so difficult to pin down is the great variety that have been used successfully.

Nonetheless I think it is safe to outline a sort of composite airfoil for unlimited ceiling gliders taken from those design factors which have shown up with greatest regularity on the most successful gliders. Supposing a 4" chord such a section would be about 7/32" thick, be flat bottomed, have a slight upsweep to a rather sharp leading edge and a high point at about 30% of the chord. This conforms remarkably to a section with the rather curious designation of NASA-USNPSI shown on p. 58 of the 1951-52 Zaic Year Book - and recommended for HLG. Here are the vital statistics:

%	UP'R	LW'R	%	UP'R	LW'R
0	0.40	0.40	50	3.80	0.00
5	2.36	0.00	60	3.48	0.00
10	3.16	0.00	70	2.96	0.00
20	3.80	0.00	80	2.24	0.00
30	3.99	0.00	90	1.42	0.00
40	3.96	0.00	100	0.32	0.00

This NACA section is shown, approximately, an #1 in the airfoli drawings. #2 is a reliable section, easy to carve anf quite popular. The third (ridge-type airfoil) has been used with a great deal of success by Curt Stevens and can be found detailed on page 168 of the 1957-58 Zaic Year Book. The triangular section (#4) actually does work. As a matter of fact Pete Nishanian has even used a variation in which the top camber was scooped out to a convex curve - and did very well with it. #5 is typical of the current undercambered sections, the one here being quite close to what Tommy Neumann is using on his 1:09 version of the Sweepette. Take your choice.



THE STATE OF THE ART

This month our featured model is not a record holder, but only because of circumstances beyond the control of the builder. Tommy Neumann, with this version of the now famous Sweepette, has made flights in excess of 1:09 under a 75' ceiling - 1:09.2 to be exact. Since Tommy is only 18, he is a Senior; that is the highest time we've heard of by a Senior.

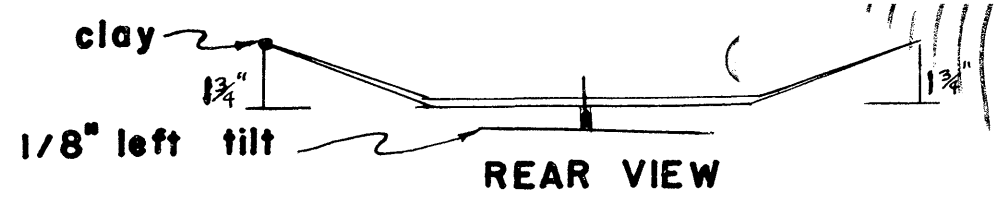
Admittedly, your editor hasn't had enough experience to check on specific points of construction for this glider, so if the plans don't give enough info, check with Tommy at 1350 Davine Dr., Glendale Hts., Glenellen P.O., Illinois.

MODIFILD SWEEPETTE 18

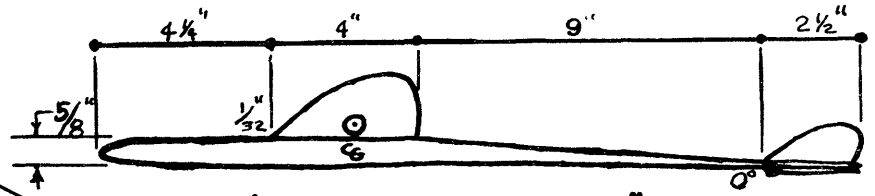
DESIGNED BY
LEE R. HINES

MODIFIED BY
TOM NEUMANN

DRAWN BY
JIM ANDREWS



REAR VIEW



55% c.g. FUSLAGE 1/8" med. hard balsa

non-lifting stab

25 lb. monofilament sanded sharp

1/16" holes in template chord c.l.

1/4" Wing Stock

WEIGHT: WING .25-.28 oz.
FUSLAGE .10 oz.
TOTAL .46-.49

FINISH WITH THINNED PLASTICIZED NITRATE DOPE APPLIED WITH A RAG & SAND LIGHTLY WITH #400 EMERY

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." JUNE 1962

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

Only two more NIMAS members joined during the month of May, bringing the total to eighty-five at press time.

MERRICK S. ANDREWS, 320 DeMott Avenue, Teaneck, New Jersey

RON DRAPER, 74 Morris Ave. Wyken, Coventry, England (Honorary Member)

More on Ballots

In the ballot report in the May issue we stated that we believed that Questions II & III were under study by the Free Flight Contest Board. Ron St. Jean called us on this and a check showed that last year's Chairman of the Contest Board failed to submit these issues to the Board. This oversight has been called to the attention of Bob Hatschek, but time has run out and 1964 is the earliest possible time for these proposals to become effective, in spite overwhelming favor for these proposals on the part of the NIMAS membership.

Along this same line, we have been aware for some time that Par. 4.7 of the AMA rules has been universally ignored at local contests and at the Nats, at least with regard to indoor models. Would you like to have this rule enforced?

Missing Something?

A few times in past months, we have received letters complaining that the writer had missed one or more issues of INDOOR NEWS; in each case the complainer had moved and failed to notify us of his new address. All copies of this issue have been mailed first class, normally we use second class mail after it is felt that the address is right.

There normally are a few extra copies of any given issue left after all mailing is done, and extra copies are available to subscribers as long as they last. In view to future requests for copies of back issues, there are some copies of the December 1961 issue, and then the supply skips to April and May, with some of each on hand.

Try to avoid missing any issues by promptly notifying us of your new address, if you wait you may not be able to find a spare copy.

Shame on You!

In the January issue an editorial request for guidance on the matter of a special charter for NIMAS; except for the charter members and one other member there was zero, count them, zero comments on the subject.

The NIMAS ballot issue resulted in a smashing 40% return from those who could have voted.

The final presentation on the NIMAS decal was made in the last issue with a plea for a choice to be made not later than May 25, 1962. As it now stands, it seems likely that less than 20% of the membership will have a hand in chosing our symbol we will use for identification. Only a pressing desire on the part of your editor and the other charter members for the decal is keeping the issue moving. In other words, if the membership doesn't care, why bother?

A bouquet to Chuck Borneman - he is the one member who cares enough to have answered in each of these cases!

****FAI INDOOR REPORT****

FAI Indoor Results

Local Elims

CLEVELAND - April 29, 1962, 18 entries, 9 qualifiers

Mike Karlak - 19:10.2	Lou Willis - 14:32.0
Frank Pavliga - 15:24.0	Jerry Skrjanc - 14:09.0
William Hulbert - 14:47	Harry Harps - 12:49.0
Jim Skinner - 14:35.0	Ron Roharik - 12:22
Stan Smith - 14:34.0	

LOS ANGELES - (Wilmington) 5 Qualifiers
Tom Finch - 13:46.2
Frank Cummings - 12:15.6
Bruce Paton - 11:00
Carl Redlin - 10:54
Lew Gitlow - 10:32

Quarter Final Elims

CHICAGO - May 12, 1962, 6 Qualifiers	
Charles Sotich - 21:38, 25:33.1	47:11.1
Bob DeBatty - 19:12.0, 25:02.0	44:14.0
Don Kintzele - 20:44.7, 22:54.4	43:39.1
Tom Neumann - 18:11.8, 21:31.8	39:43.6
Vic Hotz - 16:30.0, 20:28.8	36:58.8
Clarence Mills - 15:15.8, 14:38.4	29:54.2
DETROIT - May 6, 1962, 12 Qualifiers	
Dick Kowalski - 24:09.2, 27:13.0	51:22.2
Bill Hulbert - 24:11.0, 23:17.0	47:28.0
Stan Smith - 23:58.7, 22:49.2	47:28.0
Jim Skinner - 21:40.6, 22:59.2	44:39.8
Harry Harps - 19:42.4, 23:31.4	43:13.8
Phil Klintworth - 21:30, 21:00	42:30.0
Jim Baggi - 20:07.0, 21:42.5	41:49.5
Ron Roharik - 21:37.7, 19:11.1	40:48.8
Lou Willis - 20:13.7, 19:52.3	40:06.0
Paul Crowley - 17:17.9, 22:38.3	39:56.2
Ed Stoll - 18:13.4, 18:37.2	36:50.6
Frank Pavliga - 20:37.7, 15:08.6	35:46.3
MOFFET - May 6, 1962, 11 Qualifiers	
Carl Rambo - 34:29.0, 36:51.0	71:20.0
Frank Cummings - 34:10.0, 36:09.0	70:19.0
Lew Gitlow - 34:43.0, 35:11.0	69:54.0
Bill Atwood - 32:29.0, 37:15.0	69:44.0
Carl Redlin	65:40.0
Bruce Paton	62:51.0
Joe Bilgri	62:05.0
Manny Andrade	61:27.0
Bud Romak	54:42.0
John Lenderman	48:59.0
Warren Williams	48:09.0
LAKEHURST - May 6, 1962, 7 Qualifiers	
Ray Harlan - 33:01.2, 29:11.6	62:12.8
Bill Bigge - 27:24.8, 25:45.0	53:09.8
Jim Grant - 25:05.9, 24:48.2	49:54.1
John Triolo - 23:02.0, 21:29.0	44:31.0
Julius Rudy - 23:02.4, 20:31.5	43:33.9
C. V. Russo - 23:40.8, 19:18.2	42:54.8
Edgar Franklin - 24:10.6, 18:44.2	42:54.8

SEMI-FINAL ELIMS

For several reasons, only the first place times are shown below, and complete results will be presented next month. The Central Area elims was postponed until June 16-17, and will be reported on next month also.

WEST COAST - Moffet Field, June 3, 1962	
Carl Redlin - 35:15, 35:28	70:43
EAST COAST - Lakehurst, June 3, 1962	
Julius Rudy - 30:57, 34:09*	65:06
Bill Bigge - 30:48.2, 34:05	64:53.2

*This flight allowed on a restart pending a ruling by Bilgri. On the aborted flight, Rudy's model struck a balloon string and damaged the wing. At the time the balloon was being used to retrieve a model which had hung up. If the restart is allowed, Rudy is the East Coast team member, if not, Bigge will repeat as the team member, which makes two out of three left from last year.

****NIMAS MEETING AT NATS?****

A majority opinion of the charter members indicates that we should try to hold a first meeting of the general NIMAS membership at the Nats, provided we can line up a meeting place and a time that doesn't conflict with other important meetings which must be attended by some of our members due to their holding important AMA posts. Watch for an announcement of meeting time on the main bulletin board at the Nats.

HINTS AND KINKS

By nature, model builders are a little lazy - not too lazy, but just enough to "invent" their way out of some work. Therefore, we feel the need for this new column which will appear as often as there are enough contributions for a column.

The idea will be to simplify our hobby by passing on work saving ideas on any phase of building indoor models. Please submit your favorite tricks and short-cuts with a sketch if necessary. The description will be re-typed, but the sketches must be clear and complete, with good contrast, since our printing uses a photographic process. Keep the sketch dimensions to a maximum of 6" wide, using as much vertical space as is needed.

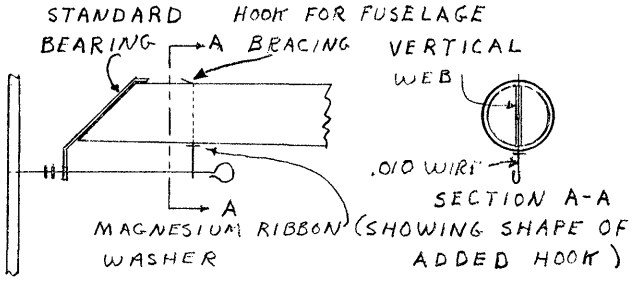
Trimming Microfilm

Of the two methods of cutting or trimming film that we've heard about; the hot wire and thinner-on-a-stick, each poses a problem. The easiest to do is the thinner method, but it is likely that some thinner will run out on the surface and leave a hole. The hot wire is a lot of bother, no matter how the wire is heated, and some of our more exotic films are very inflammable.

The trick is this: use a very soft balsa stick and a slower evaporating thinner such as butyrate thinner. Let the end of the stick soak in the thinner for a while at first. When you're ready to trim, drag the stick on the edge of the bottle to remove any excess thinner and cut the film with the "fumes" from the thinner that soaked into the wood. It is now possible to trim right next to the outline of the surface without tearing into the film on the surface. Of course, it goes without saying that the film must be stuck to the surface all around for any trimming method to produce a clean edge. Also, the stick should be dipped again every 6" or 8" of trim so the cutting will proceed smoothly.

Double Thrust Bearing

The double thrust bearing has been used for years to control the angle of the thrust line and to minimize prop wobble due to rubber creeping up on the hook. Here is an improvement on standard aluminum double bearings, dreamed up by John Triolo and reported by Manny Radoff:



DOUBLE THRUST BEARING

Says Manny, "We have given up double bearings of one piece. The rear slot in dural always wears out and the shaft slips out when least wanted or expected. Correction is to use old fashioned single bearing and a .010" music wire rear support."

Note from the sketch that the added piece of wire is supported inside the fuselage by the doubler web, and is re-inforced on the bottom by a tiny magnesium washer for additional support. Although there was no .010" wire handy, samples of .009" and .012 were bent up and weighed, with the .009 seeming to be a bit light. Weights: .009" - .0002 oz.; .012" - .000395 oz. Even the added weight of the washer should not be a weight penalty, total installation weight ought to be less than .00075 oz.

QUESTIONS AND ANSWERS

In the March issue we posed the question, "What do you know about drift control?" In addition, several low- and medium-ceiling groups were contacted for more info on controlling and/or "living with" drift as it occurs in our indoor sites.

As in most other problems facing us, drift control is a very complex problem, and is affected by dozens of variables. The basic problem, of course, is that drift will almost always terminate that "good" flight by pushing the model into the wall or some obstruction, and usually the model is damaged.

The causes of drift can be divided into three classes: 1. "external", or weather influence, 2. "internal" drift caused by localized heat sources, and 3. "ricochet" drift caused by the model contacting obstructions that change the flight pattern without hanging the model.

Of the three, ricochet drift is hardest to combat, and some corollary of Finagle's Law can be used to show that ricochet drift is almost always detrimental to the best interests of the model. Sometimes persistent offending obstructions can be removed or modified, but usually there is neither a pattern to the effect of the offender nor a way of effectively removing it. For example: Small irregularities in a smooth ceiling near the edge of the flying area - if the model (circling left) passes to the outside of the "snag" and contacts it with the left tip, the next circle will probably be much closer to the wall. If the model passes inside of the snag and brushes it with the right wing tip, the pattern usually shifts toward the center of the flight area. To remove or not to remove?

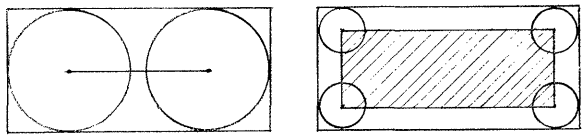
External or weather drift is caused by (usually) uneven heating of one wall of the building by the sun, or by a combination of high winds and leaks in the outer walls of the building. Sometimes, sunlight on a patch of floor will set localized drift patterns which cause lots of trouble. For the leaks and hot floor the correction is obvious; for the unevenly heated wall little can be done except hold the contests at night, which is OK only for the smaller local contests with no out-of-town entry.

Internal drift sources cause the most grief in Cat. I sites, but they are usually easiest to combat in the low ceilings also. Causes: lights making hot spots on the floor, and groups of spectators or contestants. From personal observation, normal movement of people does not set up drift patterns, regardless of how much turbulence is generated. But three or four people sitting quietly for a period of time can generate a miniature "jet stream" across the ceiling away from their location.

The building and ceiling configuration has much to do with the magnitude of disturbance caused by localized heat sources - an "ideal" site with a smooth unobstructed ceiling will permit the models to spend most of the power burst and about 50% of the cruise within 12" of the top, where the drift will have the greatest effect. Girders, lights, and hanging heaters cause many a tense moment due to ricochet drift, but usually force the model to hold a mean altitude somewhat lower than the drift pattern from localized heating - so you can't win!

Hu Entrop, a member of the group of indoor flyers in Seattle, Washington and present holder of the Category I A ROG record (12:10.0) and Class D stick record (15:24.0) pointed out early this year the advantage of dispersing contestants and spectators around the room to avoid building up a pattern of interior drift. In his last letter he relates,"As I told you in one of my other letters we try to disperse all spectators evenly around the room, but as the contest gets under waythere definitely seems to be a drift pattern that eventually dominates, driving all models against one wall. When this happens, we employ the opposite technique and bunch up to 10 or 15 spectators (providing you have that many) up against the wall in the direct path of the model. This will prevent the model, about 80% of the time, from striking the wall, in fact it may even start the model off toward another wall. By employing the same technique again it is possible about 80% of the time to prevent the model from striking any wall."

Charlie Sotich, member of the Chicago Aeronuts, had a few comments on "living with" drift, applicable to all indoor flying:



MODEL'S PATTERN RESTRICTED TO A LINE

MODEL'S PATTERN RESTRICTED TO A RECTANGLE

"In the diagrams above the circles represent the paths that models could have in a flying site. Using the largest circle possible, the center of the model's path must stay on a line, otherwise it will contact the wall. If a smaller circle is used, the center of the model can occupy a much larger area. This means the model with a small circle can drift more without getting into trouble.

In general the drift varies with altitude. Near the ceiling it may be from North to South while at the floor it may be the reverse. By observing how a model behaves on its way up and down it is sometimes possible to see how the air is circulating. A little thought will often show you how you can get a few more minutes by observing the drift. Last Saturday (1/27/62) the Aeronuts had a club contest for paper stick models. Dennis Kargol could not get his model to climb to near the ceiling. It went straight up and down without much drift, and he got over 11½ minutes. I was flying my model with a small prop that gave it a good climb. On my first flight it climbed well, but drifted fast near the ceiling and caught on a light in about 5 minutes. The next flight I rewound and backed off a few more turns. After 5 minutes it was still above where I had launched it. It climbed a bit higher and started drifting. It traveled the length of the Armory and hung up on the far wall after 12 minutes. A bigger prop or less rubber was what I should have tried."

So there you have it - some remedies to the drift problem, but nothing sure-fire and guarranteed. Commenting on Entrop's "steering" or "counter drift" technique, we have tried this in the Walnut Hill site (20' ceiling) with some success. One flight on a paper stick model was deflected time and again from hitting two baskets opposite the main body of spectators. A group of five youngsters provided "solid" control, affecting the pattern within two circles.

To those who may scream "Foul" at such ideas, we can only say that the model showed no tendency to "soar" over the group after it started down; conversely, the extra turbulence over the group seemed to cause the model to lose altitude faster. Far better control was maintained by keeping the group at least 5 or 10 feet ahead of the model's path. In our own personal opinion, the use of steering reduces the potential duration somewhat over that possible with an unlimited floor area with no obstructions. The only gain involved seems to be trading a very long flight (potential) that would have been terminated early in the cruise by a hang-up, for a shorter flight that lands in the flight area in a normal fashion.

STATE OF THE ART

This month's model established one of the higher Cat. I times that have been coming up recently - Open Class D stick (15:20). In spite of the fact that the record stood only a little over a month until a new one of 15:24 was set in a 28' ceiling, this record is still a rather important one since it set in a 22' ceiling. The designer, Charlie Sotich, tells the story thus:

"I used the same set up that I had been using for the higher ceiling;(75' - Ed.) 18" diameter, 30" pitch prop, powered by an 18" loop of .080 Pirelli rubber. My first three flights were 12:49, 13:06, and 11:50.8. There were too many turns left after the third flight so I shortened the motor by 1½". The fourth flight was made by putting in 1300 turns and backing off 80 turns before launching. About 160 turns were left in the motor after the 15:20 flight, which figures out to be 69 RPM. The prop was a single spar type with a 2¼" maximum blade width."

RECORDS? MAYBE!

Official confirmation has been received on two records previously listed:

CATEGORY II, SMU Coliseum, Dallas, 56' ceiling
Open Ornithopter - 1:58.3, Jerald B. Murphy
CATEGORY II, Livestock Coliseum, Dallas, 70' ceiling
Senior HLG - 1:55.1, Nickey Jones (Mike)

CLEVELAND AREA FAI LOCAL ELIMS, April 29, 1962,
CATEGORY II, Central Armory, Cleveland, 45' ceiling
Junior B Stick - 12:22, Ronald Roharik

DETROIT FAI QUARTER FINALS, May 6, 1962
CATEGORY II, Michigan State Fair Coliseum
Junior D Stick - 21:37.7, Ronald Roharik
Senior D Stick - 22:59.2, Jim Skinner

CHICAGO FAI QUARTER FINALS, May 12, 1962
CATEGORY I, Lecture Room, Washington Armory, 20'
Junior Autogyro - 0:54.2, Jim Skarzynski
CATEGORY II, Drill Hall, Washington Armory, 90'
Junior Autogyro - 1:59.0, Jim Skarzynski
Junior C Stick - 11:24.5, Jim Skarzynski
Senior B Stick - 12:10.2, Dennis Kargol

WEST COAST FAI SEMI-FINALS, June 3, 1962
CATEGORY III, Moffet Hangar
Open B Stick - 34:15.6, Tom Finch

NEWS FROM AROUND THE WORLD

CALIFORNIA - PACIFICA

Warren Gamble reports that the San Francisco Vultures are holding Easy B contests after the third meeting each month. The site is an auditorium with 20' ceiling, if attendance builds up they will try for a larger site. Good luck on this project - Keep 'em flying!

ILLINOIS - CHICAGO

Although the Chicago Aeronuts have lost the use of the Madison Street Armory until the winter indoor season, the club will remain sharp in indoor. They have secured the use of the Armory at 52nd Street and Cottage Grove in Chicago. If memory serves us right, this armory has a 90' ceiling, a gain of 15' over the other armory.

The monthly achievement award from the Aeronuts for May was presented to Jim Skarzynski, who set five National records in Category II, Junior division. Incidentally, Jim is 13 years old!

INDIANA - KOKOMO

The Kokomo Knight of the Round Circle finished their 1961-'62 indoor season with a bang. The last contest had 5 events, including a flying scale event with a total entry of seven.

Some "special awards" for the Junior events were donated by Bob Larsh and his wife - they were cakes baked by Mrs. Larsh! Sounds like a delicious trend?

OHIO - BEDFORD

Along with the report on the Cleveland Area FAI Local Elims, Mike Karlak noted with regret that the Armory in Cleveland where the elims were held will be torn down this summer. Mike notes that over 25 years of indoor flying by many big names has been done in this building, indoor loses a real historical site when the Armory goes.

TEXAS - DALLAS

The second Walnut Hill session had a much larger turnout that the first. Nothing spectacular was done in HLG, but the rubber times approached 8½ minutes, about the level they were at the end of the last summer session as the Center turned to basketball last fall.

The prettiest model on the floor? Dick Jordan's scale Corbin Super Ace! Dick is still working toward an optimum motor for it, but early test flights showed promise.

THE HAND LAUNCH GLIDER

PART SEVEN by RICHARD MILLER

DESIGN (cont.)

Polyhedral

Just about everyone knowledgable enough to know his longitudinal axis from his tail volume coefficient would hasten to answer the question "Why do we need dihedral?" with a statement very close to "For stability." And essentially, of course, he would be correct, although in the case of the IHLG not all that correct. An outdoor glider which must be kept from spinning in all sorts of conditions including thermal flight needs just about as much dihedral as is common today, but not an IHLG - at least not in the glide. Perhaps the extra dihedral is there to get us through the launch then? Partly, but we really don't need it there either - if our control is good! By elimination then we have left only the transition and it is precisely here that enough dihedral to give us a satisfactory roll rate is most critical.

We can begin therefore by stating that we want enough dihedral in our design to give us a roll rate which will forgive our worst launching sins. What we want to know is (a) how much is enough? and (b) what is the best configuration? We'll look at the second part first.

Now certain types of dihedral, principally polyhedral, are more efficient than others. In practical terms increased efficiency means that we get the stability and roll rate we desire with less actual tip elevation. This in turn means the greatest possible true wing span and decreased wing losses due to highly angled breaks and sharply canted tips.

As in the case of the wing planform (part 4) the ellipse seems to be the most efficient form of dihedral - at least theoretically. Someday, perhaps, someone will carve an elliptically shaped wing from a big block of balsa, or (more likely) laminate several layers of 1/16" sheet to form an elliptical wing blank. In the meantime we'll have to struggle along getting as close as we can to this elliptical ideal with the Zona saw, the sanding block and good guess work.

It is immediately obvious that we are likely to come a lot closer to the elliptical form by using something beyond dihedral; and the heading for this section - Polyhedral - states the case for dividing the HLG wing into more than the two traditional panels. Dihedral, of course, is quite serviceable and we're not likely to see the end of it for a long time. But the obvious advantages of polyhedral, in terms of improved roll rate and increased duration, and the relative ease of cutting and glueing the extra panels, make dihedral a poor compromise and a lazy man's out.

Just how advantageous and common polyhedral is can readily be seen by a glance at Bill Dunwoody's excellent chart (Outstanding Gliders of the Last Ten Years) in M.A.N. for July, 1959 - p. 25. It is noteworthy that only one glider on the chart, Dagand's, has dihedral. The fact that Dagand's time is listed as 1:16.4 might seem to some an excellent arguement for saving a few minutes extra work. Nonetheless (if the stories are true) Dagand's is reputedly a good consistent 1:08 glider, one that got an 8-second boost one day. Based on this the best dihedral gliders would seem to be about 10 seconds behind the best polyhedral gliders; and sawing those extra panels worth the little additional trouble.

It is obvious that the more panels we use the closer we can come to the ideal of elliptical polyhedral; and just as obvious that each additional cut into the wing is laible to be a cut into its total efficiency. The 4-panel wing is the compromise most people have settled for and in general is highly satisfactory. Both the 3- and 5-panel wings have the advantage of a flat center section which can be plunked directly onto the fuselage without the bother of notching and trimming. The main disadvantage I've found to this arrangement, however, is that without a center joint in the wing to give it firmness, the soft wing wood rips out easily. Nonetheless it is worth noting that Tommy Neumann's version of the Sweepette (INAV, May 1962) uses a 3-panel wing.

The 6-panel wing (#2), despite the possible losses from the extra breaks, might be a slight improvement on the 4-panel arrangement. It has probably not been tried more often due to the extra work involved, although this seems nominal to me.

But however many panels you choose, 3- or 4- or 5- or more, their arrangement seems to me to be of somewhat greater importance. The advantage of the 6-panel design, of course, is that we can get very close to the elliptical ideal with it. The nearest to this ideal we can come with a 4-panel wing would appear to be the "Curly" type (#3) with relatively flat inner panels and highly upswept outer ones. Whether this configuration is superior to the ordinary 4-panel type (#4) is an open question. Suffice it to say that the "Curly" has a fantastic roll rate which usually rescues it from the sloppiest of launches, yet deosn't seem to suffer at all when it comes to performance.

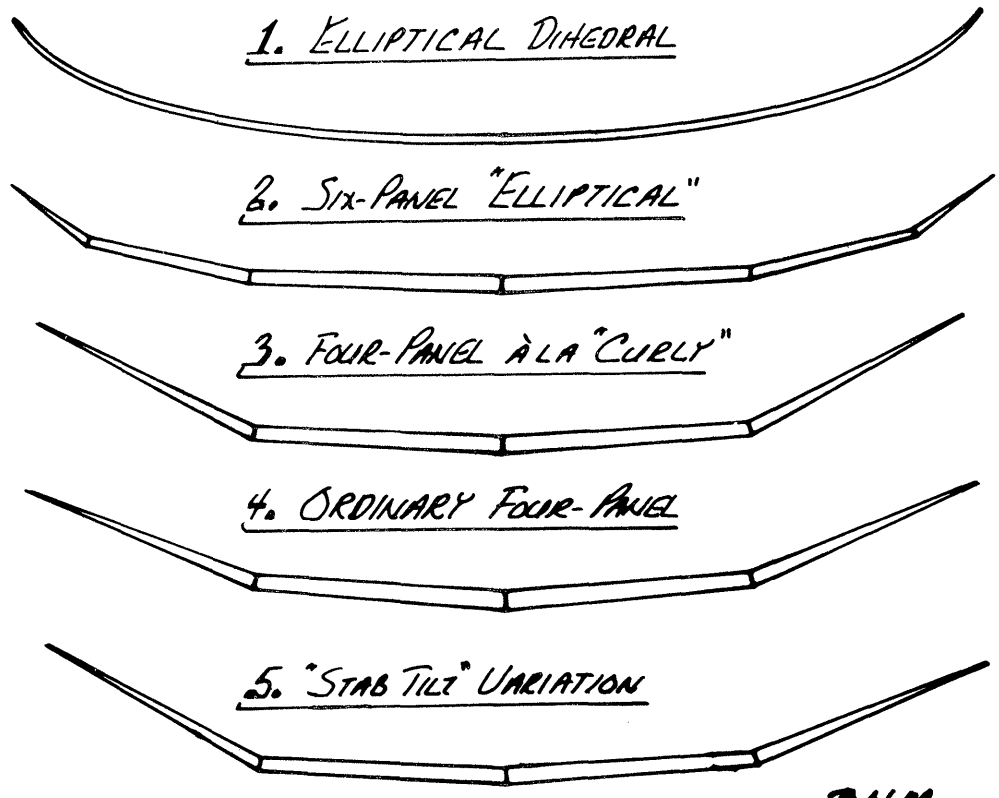
Part of the explanation of the "Curly's" excellent roll rate seems to be that the mean line of its panels form the arc of a somewhat smaller circle than do those the ordinary 4-panel wing. Thus the radius of roll is reduced, and the rate of roll is speeded up.

(There is, incidentally, a little roll rate test you can easily perform on any of your gliders if you wish. Hold the glider by the fuselage near the tail - upside down - letting the nose drop just a shade. Now swing the nose back and forth rather smartly and note the tendency of the glider to roll in the hand.)

When it comes right down, in inches and fractions, to how much polyhedral to use you can do yourself a favor by being generous. But, no matter how poor your launch, you should not have to go beyond the 2 1/4" total of the "Curly" - if you use it in the proper manner. As you gain control - and are sure of it - you can begin to lower the panels bit by bit. Working in this direction you will find that the gain in the launch profiiency will have to be considerable for each little gain in duration. This is just another way of saying that for the inexperienced at least a little extra polyhedral is an excellent investment.

There is one further way to increase the efficiency of polyhedral, a method which is contingent upon the fact that the model need only roll in one direction and one which carries the additional provision that it be used with a lifting stabilizer. This is achieved by angling the outer left panel of the wing (assuming a normal left turn in the glide) somewhat less than the outer right panel as in illustration #5. Thus, as long as there is a lifting and slightly tilted stabilizer, the vector of lift in each wing panel, from right to left, is put in a progressively different relationship to the vector of stabilizer lift. (See "The Effects of Stab Tilt" in Oct. '61 M.A.N. for more on stab tilt.) I call this set-up "elliptical stab tilt". What it does is to drag the tail of the model around in just the way we want it as the model decelerates into the transition, a phenomenon that will be discussed in more detail later on.

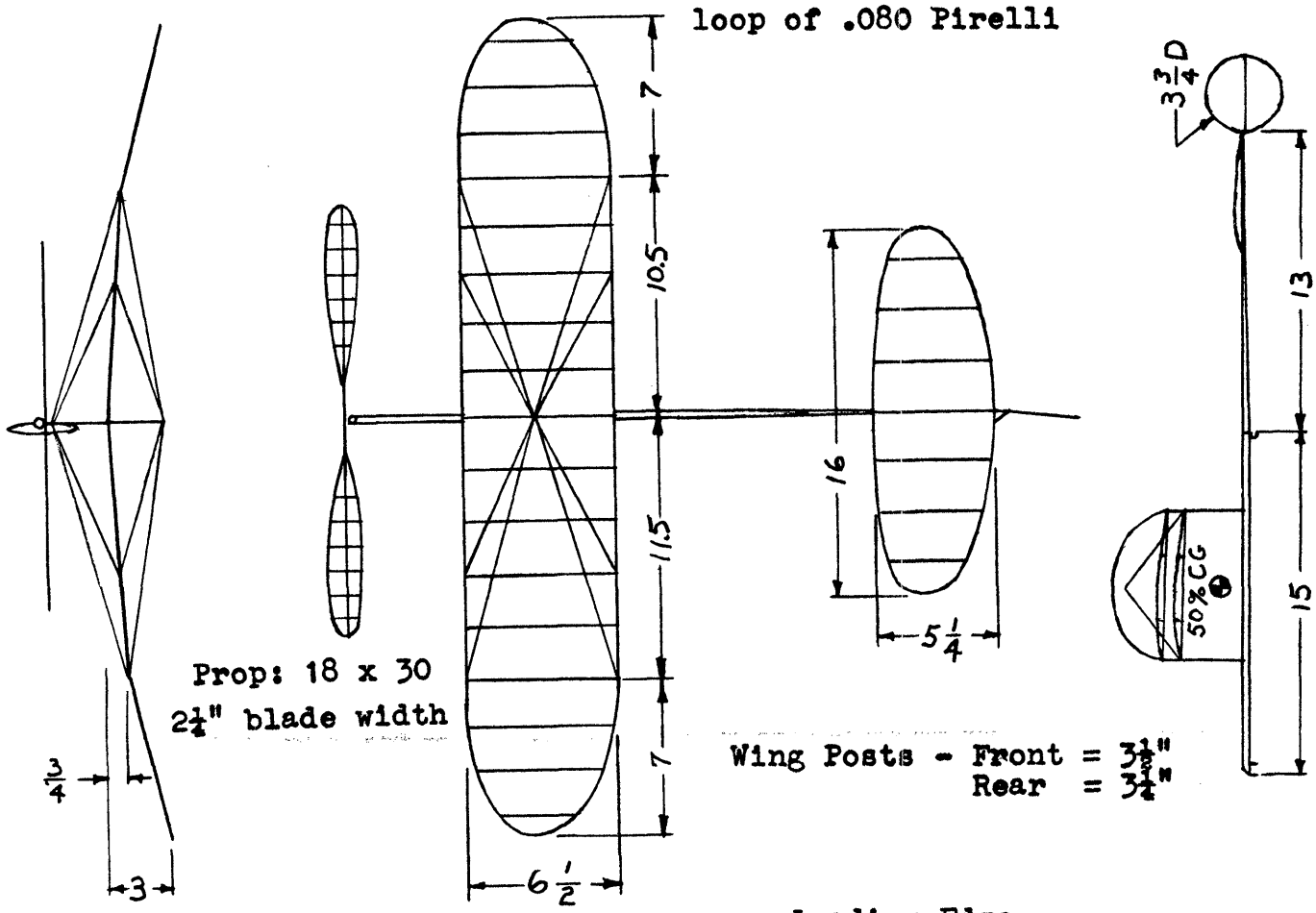
Elliptical Stab Tilt is not a half-baked idea but a device that I have used repeatedly with very positive results and one well worth incorporating in any HLG.



Printed by The Cleveland Press

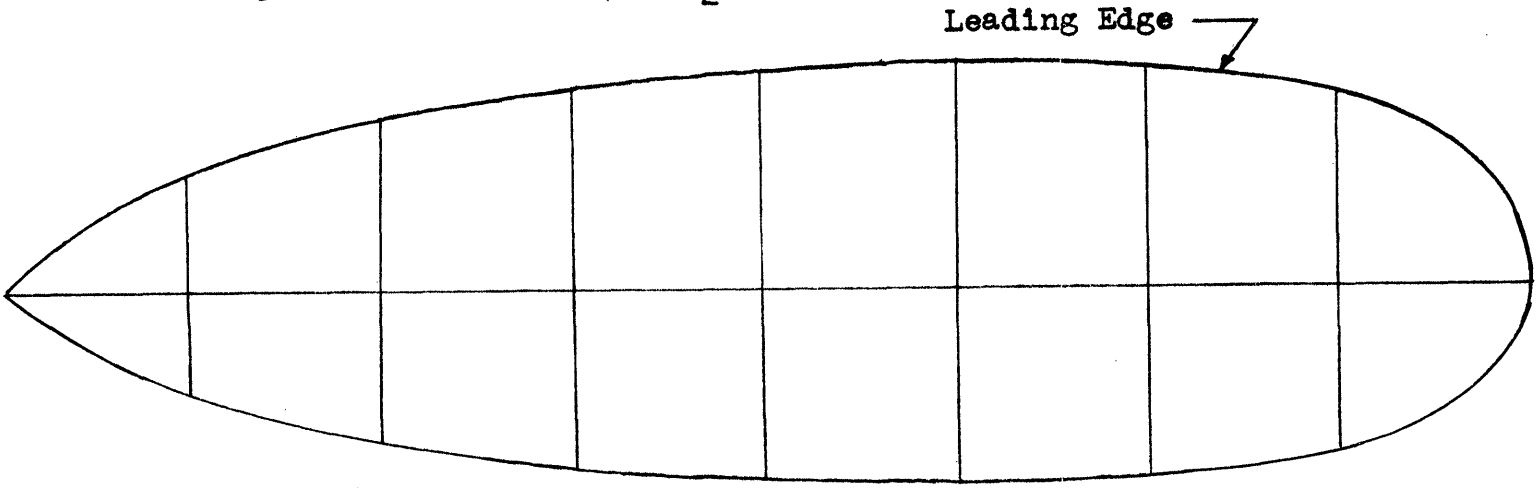
Wing and Stab airfoil
5% thick @ 36% of chord

Power: 18 to 20 inch
loop of .080 Pirelli

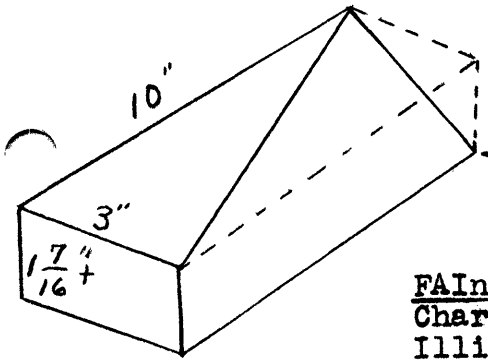


Prop: 18 x 30
2¼" blade width

Wing Posts - Front = 3⅛"
Rear = 3¼"



Full Size Prop Outline



FAInt DIP
Charles Sotich
Illinois Model Aero Club

	Weight	Area
Wing	.017 oz.	218 sq. in.
Stab	.005 oz.	70 sq. in.
Fin	.001 oz.	11 sq. in.
Fuselage	.015 oz.	
Boom	.004 oz.	
Prop	.008 oz.	
Total	.050 oz.	

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." JULY 1962

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

The month of June brought eight members to NIMAS, one of them from Finland:

JIM BAGGI, 17390 Riopelle, Detroit 3, Michigan
BOB BIENENSTEIN, 9821 Colwell, Allen Park, Michigan
BOB DEBATTY, 3130 Maple, Berwyn, Illinois
RONALD HIGGS, 25 Rossander Ct., Scarboro, Ontatio, Canada
VIC HOTZ, 319 Homewood Court, Chicago Heights, Illinois
PHIL KLINTWORTH, 834 Brooklawn Rd., Birmingham, Michigan
STAN SMITH, 4418 Urban Road, South Euclid, Ohio

ESKO HAMALAINEN, Pirttipolku 5B, Maunula/Helsinki, Finland

Decals - At Last!

The final tally of decal votes showed that #1, the local design featured in the March issue, to be the leader. Delivery on the finished decals has been promised in time for them to be mailed with this issue of INDOOR NEWS, or at least in time for the Nats.

Since there are quite a few of us who are strangers to one another, your editor would like to suggest that each of us who attends the Nats "splurge" with one decal and make a name badge to wear for easy identification. We plan to use heavy celluloid or light plexiglas as a base for the badge and to fasten the decal and a nameplate to it. The main thing is ready identification so we can get acquainted, and to advertise our organization even further than it has already been.

Handy Dictionary

Year by year, the dictionaries of our language change their content, using popular usage as a guide. For some time now, your editor has been waiting for common usage to define a pronunciation for NIMAS. Now, seven months after we organized, it appears that this pronunciation will be: NEE-mas (to rhyme with Christmas) If this is at variance with usage in some parts of the country, please let us hear from you.

NIMAS Projects

With over fifteen NIMAS members at the Detroit Semi, it was almost inevitable that future plans for NIMAS would be discussed over a beer or even between rounds at the coliseum - and they were, both places.

One of the most interesting projects to come up, and one of the most important, is the development of a set of NIMAS measurement standards - starting with standards of measurement to define rubber torque output. Pirelli varies from batch to batch, and even varies on motors cut from the same hank of rubber - so lets tie it down to a known and repeatable standard so everyone understands what anyone says about his own rubber.

It was also suggested that a survey be made of all our indoor sites, cataloging them by ceiling height, condition, and availability. This might be worked up into a booklet to help wandering members find their way around, and to give a basis for comparison of different sites.

Two other suggestions dealt with awards - first, a perpetual trophy for Indoor Stick at the Nats (there isn't one set up right now); and an award to the person or group deemed to have made the greatest contribution to Indoor during the past year.

If you like any of these suggestions, or have some of your own, let us know how you feel.

****NIMAS MEETING AT NATS?****

After considerable discussion with many people, it seems that the best time for a NIMAS meeting, if it can be arranged, would be right after the close of indoor flying on Monday, July 23. Actual time and place will be announced poster-wise at the indoor site, since this will undoubtedly give the widest contact with all indoor flyers, members or not.

It would seem most important to have an agenda ready before the meeting - please mail suggestions to:

Bud Tenny - Contest Official
c/o National Model Airplane Championships
Naval Air Station
Glenview, Illinois

It probably would be a good idea to get any agenda suggestions in the mail no later than July 19, 1962, since I'm scheduled to arrive early to help with judge training. See you all at the Nats!

****FAI INDOOR REPORT****

Results From The Semi-Final Elims

WEST COAST - Moffet Field, June 3, 1962

Carl Redlin	35:15	35:28	70:43
Joe Bilgri	33:47	36:29	70:16
Carl Rambo	31:05	35:11	66:16
Lew Gitlow	30:40	31:48	62:28
Frank Cummings	30:05	31:05	61:10
Warren Williams	26:24	30:52	57:16
Bill Atwood	20:17	35:38	55:55
Hu Entrop	21:37	32:46	54:23
Bruce Paton	28:15	25:08	53:23
Bud Romak	22:34	28:07	50:41
Hal Cover	21:55	27:23	49:18
Phil Hainer	22:10	25:15	47:25
John Lenderman	19:27	12:51	32:18

CENTRAL AREA - Michigan State Fair Coliseum, June 16-17

Bob DeBatty	24:50.4	25:40.6	50:31.0
Dick Kowalski	25:32.0	24:45.0	50:17.0
Bill Hulbert	25:20.4	24:51.2	50:11.6
Paul Crowley	24:01.8	24:44.3	48:46.1
Charles Sotich	24:56.2	23:48.0	48:44.2
Don Kintzele	24:33.4	23:36.3	48:09.7
Tom Neumann	23:03.5	22:34.4	45:37.9
Stan Smith	22:32.4	22:41.2	45:13.6
Ed Stoll	22:06.8	21:41.8	43:48.6
Phil Klintworth	19:49.0	22:59.8	42:48.8
Lou Willis	17:49.2	21:10.5	38:59.7
Bud Tenny	18:06.0	16:55.2	35:01.2
Clarence Mills	19:49.2	15:09.0	34:58.2
Mike Karlak	21:07.2	13:08.0	34:15.2
Vic Hotz	16:44.4	16:52.0	33:36.4
Frank Pavliga	17:21.9	15:47.4	33:09.3
Jim Baggi	17:10.5	15:05.4	32:12.9
Harry Harps	9:29.7	20:46.5	30:16.2

EAST COAST - Lakehurst NAS, June 3, 1962

Due to the collision-or-not-collision question raised when Julius Rudy's sixth round flight terminated on the string of a balloon being used to retreive a model, the East Coast member of the U. S. FAI Indoor Team has still not been chosen.

FAI Indoor Committee Chairman Joe Bilgri ruled that there would be a fly-off for the team slot between Bill Bigge and Julius Rudy, and this fly-off is scheduled for July 8 at Lakehurst.

Also as a consequence of the mix-up, the rest of the Lakehurst results are not available in final form. However, Bigge's total, announced last month is 64:54.4. Rudy's total, not counting the flight he was allowed in case of a favorable ruling - 54:42.8. Ray Harlan posted a total of 56:08.2, and single high flights for two other qualifiers - Jim Grant - 26:45.3; John Triolo - 26:45.5.

REPORT ON DETROIT

Smooth Electra flight to Chicago - amazed hostess asks, "What's in the boxes, bodies?" --Bull session with Pete & Charlie Sotich & Vic Hotz on Chicago-to-Detroit drive -- Welcoming crew "takes care" of Chicago crew, Kowalski, Baggi, & Klintworth at motel until wee hours, DeBatty & Kintzelle up late at Bob Bienenstein's house - Tommy Neumann played it cool & went to bed early.

Test flying & first 3 rounds uneventful in beautiful conditions - everyone getting acquainted - hydrogen generators and balloons all over - "Dead bird" dives with wings folded are common both days -- Frank Pavliga overpowered slightly - thrilling 30 seconds in the rafters before the fatal plunge, it looked as if he might make it for a while -- "Lucky" Kowalski flirting with rafters in second round for 8-10 minutes, takes the lead with third round flight that drifts across the hall twice -- Everyone vows to "get more sleep" tonight, but few do.

Results at end of round 3: Kowalski 47:17.4, Neumann 45:37.9, Kintzele 43:46.6, Crowley 43:12.2, Klintworth 42:48.8, Smith 41:47.9.

4th round - DeBatty pushes into 2nd place with 24:50.4 beautiful flight - climb-out @ 52 RPM for 14 minutes - lightly tips beams several times while Neumann & Kintzele "needle" him - Bob is too sleepy to react -- Kowalski in second by precious few seconds.

Between rounds 4 & 5 comes discussion of future NIMAS projects - Kowalski offers suggestion for rubber torque standard - 5 voices in unison, "Aha! A volunteer!"

Round 5 - De Batty inches up, so does Kowalski to hold first - Stan Smith hangs his ship solid, has to get it down in pieces - complete tail section glides down like perfect "mike" HLG!

Round 6 - Kowalski still leads until last 3 flights - Hulbert flies and misses by less than 6 seconds - DeBatty makes it by 14 seconds, and it is up to Kowalski. He winds for 28 minutes and all is OK for 11 minutes. His test flights had shown that this time was possible - but it was not to be. The model tagged a beam lightly, flips upside down and loses 30' altitude in recovery, landing 2:33 short of winning - tough break for a fine competitor!

Unusual model features noted - Sotich, Neumann & Smith used highly swept wing tips - they slide off obstructions more easily -- Smith had dyed film on one wing -- Detroit flyers using 20" dia. high pitch props & .093 Pirelli - the tighter you wind it, the more it flares.

Thanks to - Pete Sotich for many miles of personal taxi service - Hardy Broderson for service beyond the call of duty in loaning repair facilities - Oakland Cloud Dusters for donating first place trophies for all U. S. Semi-Finals - Detroit Balsa Bugs for second & third place awards - Balsa Bugs and especially Bob Bienenstein and Norm Gura for a very smoothly run contest - Mike Karlak, our roving "circulation manager" - - and to all who made this a very enjoyable trip.

REPORT ON MOFFET

by TOM FINCH

Carl Redlin took all the marbles with flights of 35:15 and 35:28, made in the first two rounds. In general, conditions were rather bad due to unpredictable drifts caused by outside winds up to 30 knots. Taking nothing at all from Carl, he was rather fortunate to get two flights to the floor as he did.

With Carl sitting on top, the pressure was really on the rest of the fellows. By the end of the fifth round Rambo, Atwood, and Bilgri were all within striking distance; Rambo and Atwood having flights of 35 plus and Bilgri with 33 plus.

The sixth round started off with conditions slightly improved but drift still pretty tricky. Of the three, Atwood got off first and climbed well but drifted into the wall at 15 or 20 minutes. Meanwhile, Bilgri got away on a real all out effort. He needed nearly 37 minutes, but it didn't look as if he had the necessary altitude. However, he hit some pretty good air and hung on quite well; the only difficulty was that he was decending right over a couple of trucks parked off to one side and very close to the wall. At 35 minutes it was obvious that he had the altitude but was too close to the wall. He ballooned the model but apparently waited too long to do it and the bad air and drafts brought him down 27 seconds short.

Rambo meanwhile broke three motors trying to get one that would take the necessary turns and got his last flight off just a minute after the closing of the last round. The flight did make it up and down to the floor but was, I believe, only about 33 minutes so that it wouldn't have won if he had gotten it off in time.

The other two who might have been contenders, Lew Gitlow and Frank Cummings, both had their troubles. Lew ended the day with no models due to broken motors and the rafters and Frank had a real streak of bad luck. His best ship was damaged in the box before the meet and he just couldn't seem to get enough turns in the motors during the meet.

One new development of some interest did show up. Bill Atwood was running a set-up using a set of gears two motors. The motors were geared in parallel; that is, the gears were in the front end so that the gears drove a a gear to which the prop shaft was attached.

QUESTIONS AND ANSWERS

Last month a question was submitted to a panel of three flyers, but too late for the answers to be returned for this issue. The question:

17. From a standpoint of structural reliability, is it better to attain a given weight of structure by using a large cross-section of very light wood or a smaller cross-section of stronger wood for each component, assuming equal quality of wood in each case?

Bill Tyler, one of the all-time indoor greats and the first to break 30 minutes with a B stick, offered some comments on question 13, which covered the height of wing struts. Sez Bill:

It doesn't matter how high or low the wing struts are designed. What does matter is that they are long enough to allow sufficient depth for proper bracing of the wing. Imagine the triangle formed by the front view of the wing spar, strut and bracing wire. If the strut is too short the effect of the bracing wire will be insufficient.

With braced sticks, (no bending action) the ideal place for the wing would be right on top of the stick to cancel out the looping tendency of the high wing-braced stick ship under full power turns, which not even down thrust will fully control.

****INDOOR AT THE NATS****

The site for the indoor Nats will be the Rockwell Armory in Chicago, 2653 West Madison Street. The ceiling is 75' up and cleaner than many Cat. II sites. Floor area is about 150' by 165', somewhat limited for the Nats, but entirely usable.

In another part of the building there are two lecture rooms with 22' ceiling that probably will be available for test flying. It behooves all NIMAS members to set an example of test flying and flying courtesy to avoid the "kicked-over bee-hive" appearance that is possible in sites with limited floor area if the flyers aren't careful.

Although the beams will not present a major problem of hang-up - there are hanging light fixtures which will cause some problems. It will be wise to have your own balloons for retreiving, and imperative that you use care and consideration for other models while retreiving.

The best of luck to each of you, and may the best flyers win!

****DRAFTSMAN WANTED****

Several months ago we "advertised" for volunteers to help get various sets of plans in shape for publication. Obviously, we have received help in this department, and it is out of a sense of fair play that we ask for more help in this department. The material gradually is building up so that an appreciable amount of lead time can be granted and the volunteers have a fair amount of time to plan the drawing and make it. At present all our draftsmen are working on future projects, further help would both ease the load on them and help you editor have time to build some models.

If you feel you could help with this phase of the publication of INDOOR NEWS, please contact Bud Tenny, Box 545, Richardson, Texas.

RECORDS? MAYBE!

Indoor record applications, or at least reports of them, have been rather scarce this month. Maybe this column will have to go underground for a few months!

From Bill Haught in Baltimore comes confirmation of these two records by his son, Billy on May 6, 1962:

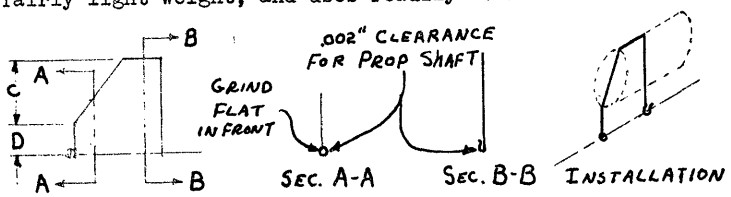
CATEGORY II - 5th. Regimental Armory, 75' ceiling
Junior A ROG - 6:20.4, Billy Haught
Junior C Stick - 11:46.6, Bill Haught

HINTS AND KINKS

We continue to present suggestion to simplify the task of building and flying indoor models - and to remind our readers that this column can use more ideas. Please send any necessary sketches with your ideas, keeping the sketch neat and with good contrast, and a maximum of 6" wide.

Another Thrust Bearing

Our favorite thrust bearing is one suggested by Charles Sotich. It has the advantage of extreme reliability and fairly light weight, and uses readily available material.



As can be seen from the sketch, this bearing mounts inside the fuselage on the stiffener web at the front of the stick. When formed from .015 music wire, typical weight runs .0012 oz.

Use a piece of music wire .002" larger than the prop shaft as a mandrel to wrap the front end of the bearing, and needle nose pliers to form the rest of the fitting.

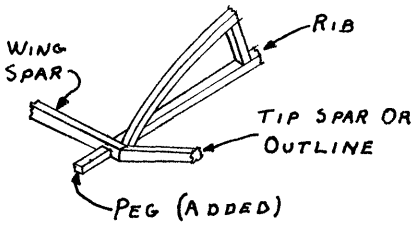
Dimension "C" will be determined by the depth of your stick, while dimension "D" determines the clearance of the prop shaft and motor. By test, .015" music wire will safely hold .080" Pirelli, so tailor the wire size to the rubber size you plan to use.

After forming the bearing, grind the front end flat and check that the prop shafts will clear. Mount the bearing carefully, using a straight wire through the bearing to aid in alignment with the stick.

BRACING HINT

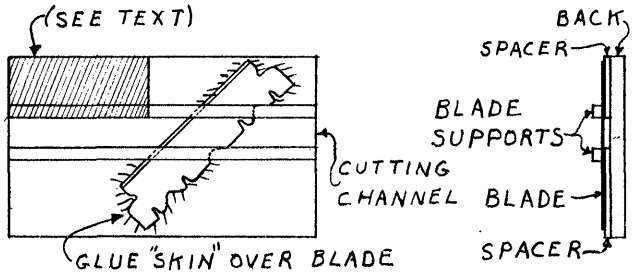
Beginners often shy away from bracing because of the supposed time and difficulty. This idea, used since 1953 by Reg Parham, makes it possible to brace a wing starting from scratch in less than an hour.

The idea is to put a very small balsa peg on the wing frame every place the wire will touch, and use the peg as a hook to hold the wire. The entire wing can be braced with one stringing, the tension weight added, and then the wire glued into place. See sketch:



Balsa Stripper

Periodically the balsa stripper appears in articles on model construction, one of the latest times was in the "Parlor Mite" article, p. 26 of Feb. '62 M.A.N. Here is an improvement on that stripper:



BALSA STRIPPER

The back piece is made from very hard balsa, the spacer thickness determines the thickness of cut, and the blade supports are hard scrap, added to re-inforce the blade mounting. The free end of the blade in the original stripper had a tendency to wander when cutting thick spar stock, so the extra spacer and support was added to the blade. The width of the cutting channel determines the maximum thickness of sheet that can be cut, and should be as narrow as possible. The cross-hatched area may be removed so that "double stripping" may be done, which increases the versatility of the instrument.

In normal stripping, the stripper is held in the right hand with the blade facing to the left, and the stock in the left hand. Pull the wood slowly through the stripper while exerting even pressure against the bottom of the cutting channel with the right edge of the stock; take it slow, and practice makes perfect. To double strip a spar, (useful when a perfectly square strip is needed, or when that "perfect sheet" of balsa is thicker than the spar you wanted to make) run it through the stripper rotated 90 degrees from the first cut; support the spar with a scrap which pushes it flat against the edge of the spacer and use the left thumb to hold the spar against the bottom of the cutting channel. In this fashion .024" square strips can be cut from 4 lb. .032" sheet.

Final precautions: use Gillete "Super Blue Blades" for best results, be sure to keep the blade free of glue in the cutting area, pull rather than push when double stripping small spars after a start is made.

NEWS FROM AROUND THE WORLD

ENGLAND - COVENTRY

Arthur Barr's latest letters reported on the May and June flying sessions in Cardingdon airshed.

The May session was still bothered by drafts from windows not yet repaired and heavy weather outside. Few really serious flights were attempted, but Arthur did log 19:44 with a "C" after conditions settled down. Ray Monks and Ron Draper were testing new FAI ships also.

Although conditions were better in June, the usual rough air up to about 50' prevailed, causing some trouble in getting above it. Ron Draper almost topped 30 minutes and Arthur boosted his best Cardingdon time to 26:24.

FINLAND - HELSINKI

Esko Hamalainen reports that the Finnish FAI team has been chosen, with the elims being held under a 45' ceiling. This site is the best available in Helsinki, and times ran from 17 to 20 minutes. Top time of 20:07 was made with a 270 sq. in. model pulled by a 20" dia. 40" pitch non-flaring prop.

ILLINOIS - CHICAGO

Weekly indoor sessions have continued in the Washington Park Armory in Chicago. Best time (90' ceiling) was turned by Tommy Neumann the week before the Detroit FAI Semi - over 28 minutes with his FAI model!

MARYLAND - BALTIMORE

Bill Haught reported on the annual Baltimore meet held in the 5th Regimental Armory. An unusual arrangement of events permitted all models to compete directly, by flying against the existing record for that model class.

In addition to regular AMA classes, events for the Ranger 21 prefab kits and for Guillow WWI Flying Scale kits.

They get the Armory free, and it has about twice the floor area of the Rockwell Armory in Chicago.

NEW YORK - NEW YORK

NIMAS/East, the eastern newsletter by Richard Miller, reports that Pete Andrews built a ship "for practice" and flew it at the East Coast Semi - and will have a better one out for the July 8 session.

TEXAS - DALLAS

With a limited attendance, the June 29 Walnut Hill session turned up two new site records - Easy I glider moved up to 0:17.0 and E-Z-Bee jumped to 6:25.2. Jim Clem's E-Z-Bee threatened to up it still further, but hung on every flight.

WASHINGTON - SEATTLE

News from Seattle has been pretty slim, even though these boys are real sharp - maybe they are too modest?? At any rate, the last letter from Hu Entrop said they are losing most of their sites, but are still looking for others.

THE STATE OF THE ART

Last January, during the rather hectic flying at the Great Lakes Indoor Air Meet, Mike Karlak set a new B Paper Stick record of 14:57.0.

On page five the details of Mike's model, the Buckeye, are shown. The model is rather similar to Phil Hainer's "Bumper" (April INAV) and very similar to Ted Gonzoph's Category III record holder, which will be featured next month.

It is of more than passing interest that the Cleveland site where the record was set is quite similar to the Rockwell Armory in Chicago, where the Nats will be held on July 23, 1962.

THE HAND LAUNCH GLIDER

PART EIGHT by RICHARD MILLER

DESIGN (cont.)

The Stabilizer

Once we have come to some more or less definite conclusions as to what we want in the way of a wing we can turn to the attendant problem of the auxiliary surfaces necessary to support the wing in flight.

Flying the wing by itself, without and additional elements, is the ideal we are forced to abandon. By providing most, if not all the lift, the wing is, after all, financing the expedition through the air in quest of higher times and anything we hang on it is bound to be costly in some degree. In this respect the wing is somewhat like a race horse. The horse could undoubtedly run faster without a jockey but wouldn't know where to go - nor how to get there. So the 100 or so pounds on the horse's back in the price for getting it to the finish line.

The closest approach to the ideal of the jockeyless horse as far as we're concerned is quite obviously the flying wing glider. A lot of work on flying wings has been done in the full scale field but despite the excellence of some of these gliders (notably the Hooten and Fauvel series) they have apparently been unable to overcome the inherent design problems adequately to compete with the more conventional machines.

The rub, of course, is that without a stabilizer (or the alternative of sweepback and wash-out) the glider has no longitudinal stability and without longitudinal stability things are pretty rough. And while, as was pointed out earlier, wash-out is not particularly detrimental in low speed flight it does have serious drawbacks at higher speeds. Furthermore the high speed problem in the indoor HLG, which may have a high- to low-speed ratio on the order of 8:1 or more, is potentially a greater problem than it is in the full-scale sailplane with its ratio of about 4:1. Thus it seems that we are about as likely to see the twin pusher replace the Boeing 707 as we are to see a successful tailless IHLG and indicates that our problem is not whether we shall have a jockey on our horse or not but rather how shall we mount him and what instructions to give him.

Thus, dismounting our metaphor, we come to the next logical step in design - usually the next in procedure and certaily the next in importance - the size, shape, placement, etc. of the stabilizer and rudder and their total aerodynamic relationship to the wing.

A Lever At The End Of A Stick

Performance and stability, whether in golfing irons, racing yachts or the IHLG, are almost invariably mutually preclusive. With the single exception of stabilizer tilt I doubt that there is any single stabilizing technique which does not impede performance, nor any means of increasing performance which does not necessitate some sacrifice in stability.

In this respect successful design consists of, on the one hand, of keeping as close to the proven aerodynamic ideals as possible and on the other of paring away, degree by degree, at the stabilizing elements; of making a series of compromises between various sets of factors - weight/strength, dihedral/effective span, etc. - then bringing them into harmony with one another. And the successful designer is the one who makes the most effective compromises, the one who treads closest to the precipice of instability, yet keeps a sure footing.

In no other instance does the resolution between the conflicting demands of performance and stability take greater judgement, nor cause more problems, than in the determination of adequate longitudinal stability. This is particularly true in the case of the hand launch g[illegible]r.

In the first place the task of the non-movable stabilizer is a difficult one. Part of this difficulty comes from the fact that the HLG wing, like most others, tends to produce its best results (highest lift/drag) at an angle-of-attack very close to the stall point of the airfoil. It is therefore up to the stabilizer to keep the wing flying at this critically high angle-of-attack (probably 7-8°), to keep it from slipping across the razor's edge into a stall, and finally to bring it back to a normal flight attitude as quickly as possible in the event of an upset.

Although both the sixe of the stabilizer and the tail moment arm are important factors in the lingitudinal stability equation it is the stab's angular setting with regard to the wing - decalage - which determines, more than anything else, its effectiveness. By mounting the stabilizer at a somewhat smaller angle-of-incidence than the wing we enable it to fly at a greater margin of safety than the wing (vis-a-vis the stall point) and to maintain its purchase on the passing airstream when the wing has gone over the edge.

The Decalage Compromise

The effectiveness of the stabilizer, its ability to put out energy for the maintenance of longitudinal stability, varies directly with the amount of decalage (or longitudinal dihedral as the British call it). Yet, at the same time, each additional degree of decalage causes the stabilizer to fly at a more wasteful angle-of-attack. In short, the energy used for stability purposes is drawn directly from the perfomance potential.

But decalage has another serious drawback beside which the slight losses caused by the stabilizer are trifling. This is the looping tendency, only half of which can be tolerated in a good HLG for quite obvious reasons. As is well known the looping tendency results primarily fro[illegible] the negative incidence in the stabilizer and increases radically with any increase in the speed of the model. From this we can see why the HLG, with its extreme low- to high-speed ratio, can tolerate only a shadow of decalage; no more in fact, than a good Martini has Vermouth. And we'll devote a lot of time to that presently.

The Tail Volume Coefficient

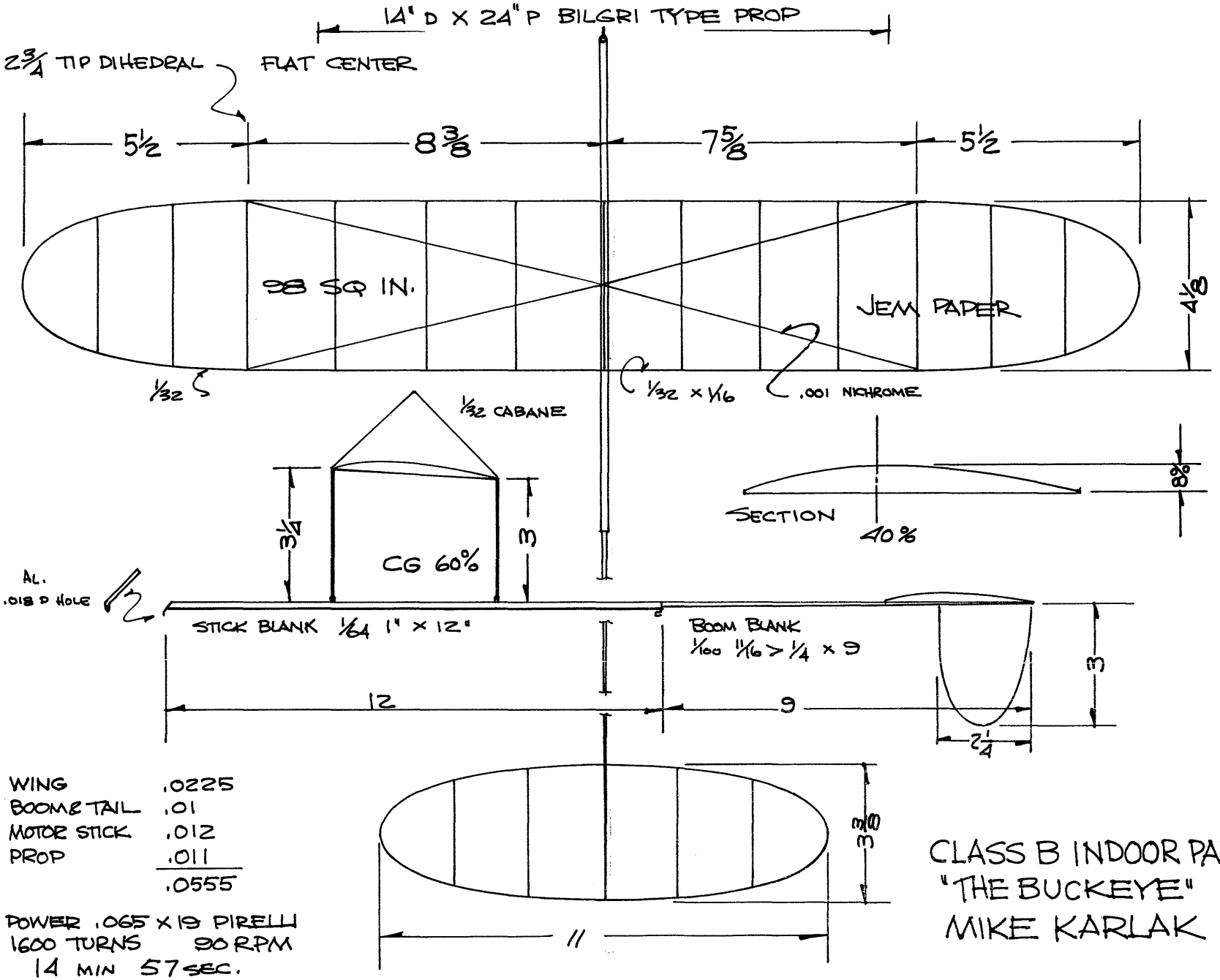
Given this specific, small and arbitrary amount of decalage as a constant (thinking of the setting as 0-0° is a little misleading) we can now calculate the tail volume coefficient for our design using the area and the moment arm as factors.

The tail volume coefficient is a felicitious method of calculating, and expressing in a single factor, the complex relationship between the aerodynamic forces of the wing and stab; an expedient manner of predicting within general limits the degree of longitudinal stability of the model; a very handy tool for the HLG designer; and finally a small, well directed blow against the conceits of ignorance and folly.

The coefficient is arrived at by dividing the product of the stabilizer area X the moment arm by the product of the wing area X the wing chord; (the moment arm here being measured from the CG to 25% of the stab's MAC). The number which results from this calculation may fall within fairly wide bounds. If the designer is disposed toward a small symmetrical stabilizer and a forward CG (45-50%) he may come out with a number as small as .7; if on the other hand he favors a large lifting stab and a rearward CG (60-65%) the number may be something like 1.1, perhaps higher.

Next month we will take a look at these two schools of thought concerning the stabilizer and its potentials.

HB 5/28/62



WING	.0225
BOOM & TAIL	.01
MOTOR STICK	.012
PROP	.011
	.0555

POWER .065 X 19 PIRELLI
1600 TURNS 90 RPM
14 MIN 57 SEC.

CLASS B INDOOR PAPER
"THE BUCKEYE"
MIKE KARLAK

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." AUGUST 1962

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

NIMAS membership climbed to a grand total of ninety-eight members during the month of July, with the following **indoor** flyers joining the fold:

BILL DUNWOODY, 985 Ft. Salonga Rd., Northport, New York
OTTO HEITHECKER, 33151 Willow Lane, Fraser, Michigan
BRUCE PATON, L. M. Cox Mfg. Co., Inc., Box 476, Santa Ana, California
FRANK PAVLIGA, 245 N. Roanoke, Youngstown, Ohio
GERALD SKRJANC, 1671 East 34th. Street, Lorain, Ohio
ED SMOLA, 159 Prentice Road, Painesville, Ohio

HANDY DICTIONARY

From charter member Dave Copple comes the pronunciation used on the West Coast: NI-mas, and Ronald Higgs sez Canadian accents will probably wind up with: NEM-as.

No matter how we say it, NIMAS stands for the nicest group of fellows it has been our pleasure to meet, all banded together for the purpose of insuring that indoor model flying never again dies out, but instead goes on to new heights of achievement and fellowship.

FIRST NIMAS MEETING

After a long day of flying indoor, followed by a long evening of processing models for the next day, about 20 NIMAS members assembled for our first meeting. After the usual introductions and chit-chat, several items of old and new business were discussed.

The list of NIMAS projects suggested in the July issue were discussed, and some approaches to the business of determining the quality of rubber were discussed by Bill Bigge and Dick Kowalski. Phil Klintworth reported on his plans for a site survey form, giving emphasis to factors which would enable the reader to have a clear picture of flying conditions in each site.

The first opportunity for NIMAS to act in an advisory capacity came at this meeting, also. Frank Ehling, Technical Director of A. M. A., recently came across the old Stout Commercial Trophy and decided to rejuvenate it. Frank then asked for an official NIMAS opinion on what use it could be put to. After due deliberation, we suggested that it be used as a perpetual trophy for indoor stick, but that care be taken to keep the past history of this trophy alive and to preserve, if possible, the names of the original winners, who were competing in outdoor rubber-powered cabin events.

More on Decals

The production of our decals was consistently nampered by high and changing humidity, which in turn seriously slowed delivery on the finished article. A partial shipment was hand-carried to the Nats by Kowalski, and several members received their decals at the Nats.

It all boils down to this - your decals should be in your hands before or with this newsletter, and if you do not receive them by August 15, you have been overlooked and should notify me at Box 545, Richardson, Texas

It Ain't So!

If you have written recently and haven't received any answer, please do not assume your editor has died on the vine. When he left for the Nats, there was a backlog of over 15 letters - upon his return, fifteen more awaited. Hopefully, these will soon be answered, and thing will ome back to a more normal state of affairs.

Contest Board Meeting

Almost everyone attends one or more meetings at the Nats, and we were no exception. By invitation, we sat in on the Free Flight Contest Board meeting called by Bob Hatschek, since there were indoor rules proposals under discussion. Dick Kowalski, as Central Area Indoor FAI Chairman also attended.

We feel that significant progress was made, in spite of the fact that there were only five board members or their representative present. In effect, any vote taken would not be final, but would reduce the number of mail polls needed to complete any single item.

One of the first trends to appear was the apparent demise of the solid stick proposal - it appears likely that an official rejection of this proposal will soon be made.

The series of IHLG rules proposals came under discussion that evening, and some progress was made toward straightening this problem out, but not in time for the 1963 rules.

Finally, considerable discussion of the unworkable and unenforced "winding rule" (Par. 4.7 in the AMA rule book) was made, and recommendations by Kowalski were made a part of the minutes of the meeting. It appears hopeful that this ambiguity in our rules will also be eliminated.

RESULTS FROM THE INDOOR NATS

JUNIOR IHLG	1.	Jim Skarzynski	0:49.2
	2.	James Lewis	0:47.6
	3.	Dick Robinson	0:47.2
	4.	Dan Neumann	0:43.2
	5.	Dan Vogt	0:41.1
SENIOR IHLG	1.	Tommy Neumann	1:05.5
	2.	Dan O'Malley	0:58.2
	3.	Faust Parker, Jr.	0:54.2
	4.	Larry Miller	0:49.4
	5.	Larry Loucka	0:49.3
OPEN IHLG	1.	Otto Heithecker	1:05.0
	2.	Robert Larsh	1:04.0
	3.	Arnold Zimmerman	1:03.2
	4.	Jim Baggi	1:02.8
	5.	Tem Johnson	0:57.8(0:57.6)
		Reid Simpson	0:57.8(0:54.0)
JUNIOR PAPER STICK	1.	David Erbach	11:18.8
	2.	Jan Servaites	9:15.2
	3.	Ronald Roharik	7:24.6
	4.	Bernie Wisniewski	6:06.3
	5.	Billy Haught	5:44.9
SENIOR PAPER STICK	1.	Jim Skinner	12:53.2
	2.	Shaye Diebolt	10:29.9
	3.	Terry Hamer	10:04.3
	4.	Tommy Neumann	9:12.9
	5.	Dennis Kargol	8:54.0
OPEN PAPER STICK	1.	Phil Klintworth	15:51.0
	2.	Bill Bigge	14:59.6
	3.	Bill Gough	14:15.0
	4.	Ed Stoll	13:42.0
	5.	Ted Gonzoph	13:41.9
JUNIOR INDOOR STICK	1.	Jim Skarzynski	14:15.0
	2	Jan Servaites	10:48.9
	3.	David Erbach	9:12.0
	4.	Billy Haught	9:02.6
	5.	Mary Alexander	9:02.2
SENIOR INDOOR STICK	1.	Jim Skinner	19:09.2
	2.	Dennis Kargol	13:06.1
	3.	Chad Krogh	12:46.0
	4.	Tommy Neumann	9:23.1
OPEN INDOOR STICK	1.	Phil Klintworth	23:29.0
	2.	Ted Prasol	21:04.7
	3.	Dick Kowalski	19:51.9
	4.	C. V. Russo	19:25.5
	5.	Ted Gonzoph	18:52.3
	6.	Ed Stoll	18:38.9
	7.	Don Kintzele	18:05.6
	8.	Gerald Skrjanc	17:56.0
	9.	Charlie Sotich	15:38.2
	10.	Walter Erbach	14:04.2

JUNIOR CABIN	1. David Erbach	7:35.8
	2. Jim Skarzynski	6:38.6
	3. Ronald Roharik	6:17.0
	4. Herbert Schubert	0:07.0
SENIOR CABIN	1. Tommy Neumann	10:29.0
	2. Jim Skinner	5:58.1
	3. Shaye Diebolt	5:53.3
	4. Dennis Kargol	5:35.0
OPEN CABIN	1. Bob Champine	15:50.3
	2. Charlie Sotich	10:23.1
	3. Dick Kowalski	9:49.3
	4. Phil Klintworth	8:17.2
	5. Bill Bigge	7:06.1

NATS REPORT

A complete, and we hope accurate, report of the Nats results appears elsewhere in this issue, but we would pass on impressions of the trip and flying as we saw it.

As we feared, the air was pretty crowded all day long, but especially during the HLG session. Drift was high all over the building most of the day, except right in the center, and collisions were pretty frequent all day long. The Navy furnished helium for balloons, and so those fortunate enough to hang on lights without sticking solid were able to fish them down. However, there are some kind of projections on the top of the light fixtures that often foiled attempts to remove a model in one piece.

It appeared that everyone went out of their way to avoid snagging models with the balloons, but it is a pity that this courtesy did not extend to keeping the floor clear of people. One time in particular, twelve models were in the air, which would allow a maximum of twenty-four people on the floor (twelve timers and twelve owners). Even these people should have been on the sidelines, since visibility was good enough for the timers to keep track of the models and the owners could do nothing for their models except pray in case of danger to the model. At the same time the twelve models were counted, a quick check showed close to ninety people out in the flying area, most of them with no connection with any models at all.

The high points of the trip for us occurred on the Saturday previous to the indoor session, as we attended a practice session at the Washington Park Armory. This turned out to be a very relaxed flying session, which surprisingly enough was poorly attended.

We saw Tommy Neumann hit 1:10+ with his glider for the first time, and our own ships turned in the highest times ever for Category II flying. The real joy, however, was the completely relaxed atmosphere of a casual indoor session, the likes of which we haven't seen before. This is the real joy of indoor flying, rather than the high level of pressure which exists during a contest. The Chicago area flyers are really fortunate to have an armory available almost every week all year long.

****ON GUARD!****

Almost immediately upon our arrival home from the Nats, a brief attempt to relax and unwind with the latest copy of MODEL AIRPLANE NEWS was shattered by the lead article on page 29. In the unlikely event you haven't seen it, this was a three-picture-and-lengthy report on flights made in a 42' x 60' gymnasium with an .010 powered R/C model.

Complete model details, design suggestions for this type of flying, and the statement that indoor R/C flying is the answer to cold weather problems pretty well completed the article, but one other thing grated harshly as we read on: "Here are a few tips to put you into the act in case they open Lakehurst for indoor R/C: - - -."

Maybe this doesn't hit you as hard as it does us, but we know of more than one indoor site permanently barred to model builders because model builders sometime in the past had operated power models in the site, with the easy-to-predict result of fuel mess and worse. Such ill-advised and inconsiderate actions on the part of a selfish few seems to be the norm in these days, and the hobby suffers as a result.

Our immediate action, which we suggest you reinforce with letters of your own, was a letter of protest to the editor of the article and copies to the editors of each of the three model magazines. The letter said in part: "In this time of rapidly vanishing sites for all types of models, please do not encourage <u>any</u> group to use the facilities of another group when there would be the slightest chance of causing the site to be closed down. This applies in the case just mentioned, and for F/F in R/C only sites, and for F/F and R/C on U/C sites, no matter where or when it occurs. The loss of a site due to lack of consideration and/or misuse by any group is now acute - and should be editorialized against rather than encouraged. Gas powered models indoors is unwise from a practical standpoint, dangerous from a safety standpoint, and intolerable from an ethical standpoint. After all, the powered models <u>can</u> be flown out-of-doors, and the reverse is not true."

As a final stop-gap for your own treasured sites, it would not be amiss to warn the sponsors or directors of <u>your</u> site that something like this might be suggested by other groups, explain the hazards to the sites and participants, and make sure that there is no chance of your group being blamed for the actions of some other group.

AND AGAIN - - -

The vast accumulation of mail awaiting us brought more disheartening and disturbing news - this time from New Zealand. For several months John Malkin has been in close contact with the proper authorities over the matter of his proxy entry in the upcoming World Indoor Championships. <u>After</u> his model and entry were received in England (shipped at his personal expense of over $100), he was informed by letter from Henry J. Nicholls that due to the likelihood of damage requiring extensive repair to indoor models, proxy entry would be unacceptable.

Even though Mr. Nicholls was only acting in his capacity as FAI delegate for the S.M.A.E., it seems that some effort could have been made to have avoided such a gross neglect of simple human courtesy, especially since it has been common knowledge in most circles that John had contemplated entry for some time.

An even deeper undercurrent of concern arises from this action, something that strikes at the very foundations of F. A. I. model competitions. At one time, the practice was to hold international model competition in the country of the previous year's winning team. Now, it seems that sites have been limited to the area in and around continental Europe. For years it has been custom to permit proxy entry for those teams unable to afford a trip to the contest site - and again this is being done away with.

It was estimated that it would cost over $1400 <u>per man</u> to field a team from New Zealand - who could afford such costs?

Maybe the time has come to evaluate the entire F.A.I. model competition program. Is the site restriction and possible elimination of all proxy flying consistent with the concept of a "Model Airplane Olympics" as it has been in years past? Is it possible (perish the thought!) that this noble concept is degenerating into a European contest for Europeans, and possibly even a show place for state-sponsored Iron Curtain teams?

In days gone past, the feeling of true international competition was preserved quite well by moving the event to the country of the winning team, a feeling which isn't preserved by the mere entry of teams from several not-so-widely separated countries. Also, the proxy entry made it possible for distant countries to maintain touch with the event and be in better shape to win if the contest came close enough for them to participate in person. If the Malkin ruling is truly an opening to eventually do away with all proxy flying, as some feel, the FAI model competition program will truly have degenerated to merely a good European contest.

****FAI INDOOR REPORT****

East Coast Results

LAKEHURST - June 3, 1962	
Julius Rudy - 30:57.4, 34:09.4*	65:06.8
Bill Bigge - 30:48.2, 34:06.2	65:06.8
Ray Harlan - 28:14.2, 27:54.0	56:08.2
John Triolo - 22:02.7, 26:45.5	48:48.2
Jim Grant - 26:45.3, 11:35.0	38:20.3
Edgar Franklin - 13:31.5, 13:44.6	27:16.1

*This flight was made on a re-start allowed after collision with a balloon string being used to retreive another model, pending a ruling by Joe Bilgri. Joe ruled that

there should be a fly-off between Bigge and Rudy, and that fly-off was held July 8 with these results:

Round	Bigge	Rudy
1	-----	:53.8
	-----	9:22.0
3	26:39.2 *	20:31.5 *
4	15:02.8	12:09.6
5	30:47.0 *	17:51.0
6	25:19.6	24:10.0 *
Best 2 *	57:26.2	44:41.5

CENTRAL U.S. TEAM MEMBER RESIGNS

A rumor making the rounds during the last of the Nats stated that Bob DeBatty would be unable to make the trip to the World Indoor Championships for unspecified personal reasons. This was confirmed by a call to Bob, so this team berth will be filled by Dick Kowalski. With this change, the U. S. Indoor Team is:

WEST COAST	Carl Redlin
CENTRAL AREA	Dick Kowalski
EAST COAST	Bill Bigge
MANAGER	Joe Bilgri

FOREIGN FAI INDOOR TEAMS

Finland

Public Hall in Helsinki - 45' ceiling

Esko Hamalainen	20:07
Harry Raulio	17:28
Arto Tauria	14:30

Manager - Reino Hyvarinen

Germany

The German Championships will be held in Dortmund on August 12, and the site there has a 75' ceiling. The only advance info available on possible team members is that Max Hacklinger has made many flights over 30 minutes in the site, so only an unusual run of bad luck will prevent Max from being on the team.

Great Britain

Good flying conditions at Cardington have been very spotty, and some concern is being felt over the short time remaining before the World Championships. The British Championships will be held in Cardington at the August session, but no recent reports have given the date.

Hungary

So far there has been no news of indoor activity for team selection in Hungary, although we assume they will again have an entry.

New Zealand

As mentioned elsewhere, John Malkin has submitted a proxy entry from New Zealand. John has received word from Henry Nicholls that proxy entry would be unacceptable, but Reg Parham and others have gone to bat for John, in an attempt to get his entry certified.

RECORDS? MAYBE!

LAKEHURST RECORD TRIALS, July 8, 1962
CATEGORY III, Lakehurst #6
Senior D Stick - 30:26.0, Drew Morris

NATIONAL MODEL AIRPLANE CHAMPIONSHIPS, July 23, 1962
CATEGORY II, Rockwell Armory, Chicago, 75' ceiling
Junior C Cabin - 7:35.8, David Erbach
Junior C Stick - 14:15.0, Jim Skarzynski
Senior C Cabin - 10:29.0, Tommy Neumann
Senior Paper Stick - 12:53.2, Jim Skinner
Open Cabin - 15:50.3, Bob Champine
Open Paper Stick - 15:51.0, Phil Klintworth

Junior Helicopter - 3:42.2, David Erbach

L. A. SMOGCUTTERS' CAT. I RECORD TRIALS, June 28, 1962
CAT. I, Culver City Vet's Auditorium, 34' 9" ceiling
Senior Paper Stick - 8:06, Sonny Myers
Open Helicopter - 5:21, Hal Cover

QUESTIONS AND ANSWERS

Some time ago this column posed question #17 and polled some flyers on their opinion and practices with regard to that question.

17. From a standpoint of structural reliability, is it better to attain a given weight of structure by using a large cross-section of very light wood or a smaller cross-section of stronger wood for each component, assuming equal quality of wood in each case?

Tom Finch, present holder of the Cat. II A ROG record and the Cat. III B Stick record makes these comments:

"First, we'd better attempt to define what is meant by "strength" as applied to wood for indoor models. There are two factors involved, they are: stiffness or resistance to bending, and ultimate strength or the maximum load that a part will carry before failing. Generally, one would talk in terms of strength per unit area, but for purposes of comparison I think it makes more sense to consider strength per unit weight. In general, lighter wood is stiffer on this basis while the heavier wood is more flexible but will take a higher load before breaking. It is on this basis that the choice of wood must be made. Which of these characteristics is more important in the particular usage? There are two basic structural members involved in an indoor model; tubes and strips. Generally, a fairly light wood is employed for tubes. For very light structures an extremely light wood is necessary to keep thicknesses up to workable levels. For spars, it is another story. General practice has been to use fairly heavy wood, about 6 or 7 pound stock. One reason for this is probably that, generally, good light spar stock has not been available. However, recently we have been able to obtain some exceptional 4 to 4½ lb. wood with fairly long grain that makes beautiful spars. In summary, then, light wood is best if you can obtain good wood, but good spar stock in the 4 to 4½ lb. bracket is hard to come by."

Charlie Sotich, who flies Category II almost exclusively, and has to contend with obstructions on almost all flights, made the following comments:

"Light wood seems to have the characteristic of breaking with a "snap", often followed with a small puff of dust. When a wing or other structure is made of this type of material, I have found that the wing (or other part) tends to crack very easily when it bounces off an obstruction while flying. Using wood that has a higher density, and usually higher strength, requires the cross-section to be reduced to keep the weight down. If the heavier wood is stringier it won't crack so easily on impact. I prefer the wood that is stringy and slightly heavier (about 6# stock) to the light wood for several reasons:

1. It won't break as easily so I can do more flying and less repairing.
2. Good 6# wood is easier to obtain than 5#, or 4# stock.
3. Using heavier wood, a finished model is likely to be heavier, but strong, so it can be flown under most conditions. Using light wood, parts are often too weak and won't permit any flying until some bracing is added."

NEWS FROM AROUND THE WORLD

CALIFORNIA

Reading between the lines in a letter from Hal Cover, we might guess that the Smogcutters have found one of the best Cat. I sites around - ceiling at 34' 9" and only two obstructions in the form of speaker boxes. Where? The Culver City Veteran's Auditorium!

The times at a record trials held there were quite good - top glider time (balsa) was 36.5 by Sonny Myers, a Senior. Sonny also put up 8:06 for a new Paper Stick record, plane design by Hal Cover. Hal's helicopter went for another record - 5:21, and Frank Cummings and Tom Finch were also out trying for "A" and "D" respectively.

ENGLAND

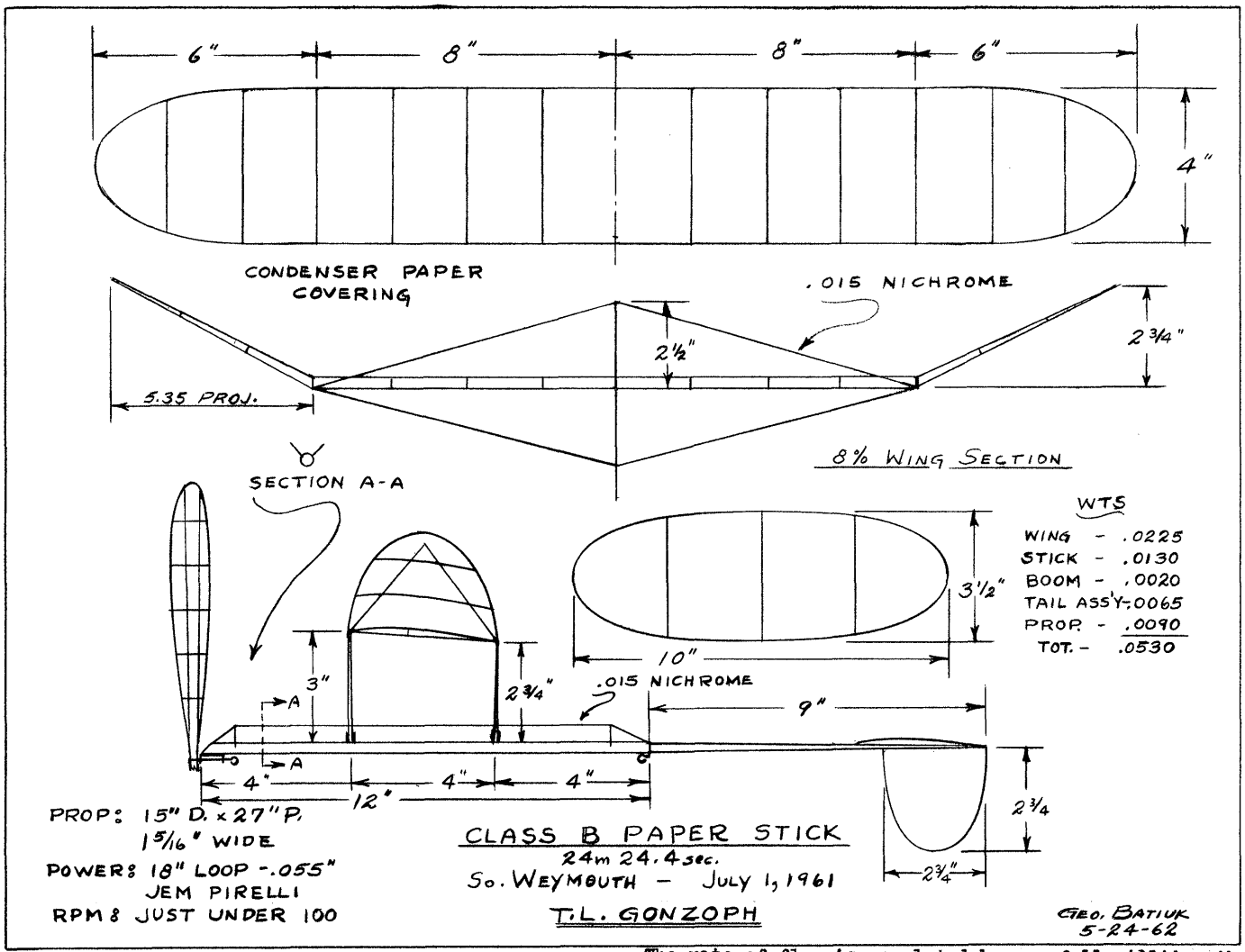
From Reg Parham and Arthur Barr comes reports of the recent practice sessions in Cardington. The weather for all their sessions so far has been rather bad, and the repair work on the hangar is still going on. Conditions have been so bad that no one has really been able to fly his ships to full potential, and there is growing concern over picking the British team for the Championships.

In addition, some housing on the base has been torn down, so some of the Championships entrants may have to be put up in Bedford (about 2 miles from the base).

FINLAND

The public hall in Helsinki, where the Finnish FAI elims took place, has been made available to the flyers every weekday during the summer months - lucky boys! Esko Hamalainen also predicts that the 45' site will be seeing flights over 23 minutes as the boys progress.

Esko flies copilot on a "Caravelle" for FINNAIR, the



largest Finnish airline, making regular runs to several cities in Europe. FINNAIR, incidentally, sponsors the Finnish FAI team transportation costs to the Championships each year.

NEW ZEALAND

After hard work by John Malkin and others in the Upper Hutt Aeromodellers, the N.Z.M.A.A. (equivalent to A.M.A. here) adopted two ceiling categories, divided at 30', and changed the flying procedure so an indoor flyer can now hold his model while winding. The club is still working to get indoor classes returned to the agenda for the N. Z. Nats.

The Vogue Theatre (in Upper Hutt?) is the present scene for all the club's indoor sessions, and has a 26'+ ceiling. Easy B (Wilmington rules) is the most popular event, and the top Easy B time is 6:19, set by Brian Roots. It is reported that John Malkin is hard after that record, so it may not stand long.

STATE OF THE ART

Somehow, we missed meeting Ted Gonzoph at the Nats, and didn't get to compare his fifth place winning ship with the one shown here. In his last letter, he indicated plans to duplicate this model for Category II except for higher prop pitch than shown here.

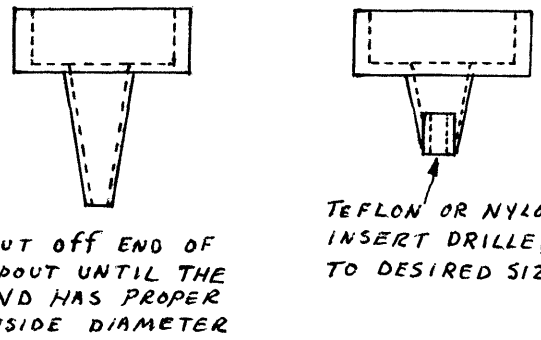
The details of power, flight time, and R.P.M. show up on the plan, but Ted sez an earlier version using a 6% airfoil was "a great big zero". It would be interesting to build several wings for a given ship, changing only the airfoil, and test fly until enough flights under varying conditions had proved out the best airfoil.

HINTS AND KINKS

Microfilm Pouring Spout

A uniform and carefully regulated pouring rate is a must for good sheets of microfilm, if all other factors are equal. For years, the practice has been to use a spoon or similar container to pour the film solution from. The rate of flow is regulated by carefully tilting the cup for even pouring, while also regulating the water coverage by the speed at which the cup is moved across the tank.

Of course, if the flow rate is regulated and repeatable, much more uniform results and less waste can be had. Plastic squeeze bottles with detachable funnel-shaped spouts can be modified to deliver constant flow at the proper rate for your particular film. Refer to the two sketches below, and modify the spouts as shown:



If you have several of these bottles, the method on the left is easiest. Working carefully, trim the end of the spout until the remaining spout has the right size hole to give the proper color sheet of film. If too much material is removed, the tip can be heated until it closes down some, but this is not quite as satisfactory.

If desired, the same spout can be used for several different film solutions and film colors by making several different teflon or nylon inserts, each with a different hole size. A good place to start on hole size is #37 drill - gold and hazy brown sheets indicate the need for a larger hole, while red-green "saran wrap" film shows you have gone too far.

To use this gadget after making a trial modification on the spout, re-attach the spout to the bottle and cut out the bottom of the bottle. Pour two or three tablespoons of film solution into the gadget while using your little finger as a stopper for the spout. Leave the film bottle top off so there will be a place to set the gadget after pouring a sheet.

For right-handers, hold the filled gadget about one inch above the water at the right end of the tank. Start a uniform, sweeping motion toward the other end of the tank, while simultaneously unstopping the spout. About eight or ten inches from the end of the tank, cut off the flow while following through with the sweep. If the flow runs too close to the end of the tank, wet solution will bunch at the end of the tank, producing heavy film and drying too slowly.

After use, clean the spout with thinner, and store until the next time. This gadget will give uniform sheets time and again, and results repeatable the next time. However, no guarrantee is made about picking the film up after pouring - you are on your own in that department!

THE HAND LAUNCH GLIDER

PART NINE by RICHARD MILLER

DESIGN (cont.)

Two Schools of Thought

When it comes to determining the size of the stabilizer and the work it is to perform there are two schools of thought separated by numerous shades of varying opinion. One of the schools, the advocates of the small symmetrical stabilizer, feels that the surfaces need do no more than is implied in its name, and do it very modestly at that. The large lifting stab school, on the other hand, ask themselves why the stabilizer shouldn't be called on to perform a more versatile role. Both schools have the feeling that they have the best solution to a major problem of design. And both, of course, are right. At any rate, if they're not they should be.

The small symmetrical stab school reasons that insomuch as every bit of stabilizer causes structural problems, adds weight, increases drag and compromises launch altitude that it is wise to keep the surface as small and unobtrusive as possible. Such as, for example, a 20% stabilizer on three chord lengths. Gliders such as Foster's 1:14 machine and the Sweepette fall into this category.

The large lifting stab proponents, although they're quite ready to admit the above claims, argue that this is not, by any means, the whole story. Why, they reason, when you've gone to all the trouble of selecting the wood, building the stab, aligning and attaching it to the model, then throwing the whole shootin' match as high as you can get it, why (they say) when you've gone to all this trouble, shouldn't the stab do some additional work on the way down?

People with such convictions are liable to go to a stab area of 30% or higher and use a lifting section as well. They are also liable to point out the fact that a lifting stabilizer can be tilted in such a manner as to be a considerable help in turning the model and getting it to recover more smoothly. Finally they would be apt to point out that a lifting, or at least non-symmetrical stab section is less liable to flutter during launch than a symmetrical section and that many builders use lifting sections, even when not concerned about lift, for just this reason.

How To Get What We Want

Once we have an idea what it is we want from the stabilizer we can begin the somewhat less difficult problem of assembling our elements in a manner best calculated to achieve it. Our first problem, as implied above, is general stabilizer effectiveness. Now as any able amatuer aerodynamicist knows, a large stabilizer on a short moment arm (MA) is roughly equivalent to a small stabilizer on a long moment arm - at least as far as glide performance is concerned - and the Tail Volume Coefficient formula can be made to yield the same results from either point of view.

How then to proportion things? We are hedged in on one side by the fact that drag and structural limitations dictate an absolute size for the HLG stabilizer (thus suggesting a long tail moment arm) and on the other by the limits which extending heavy fuselage wood rearward from the CG places on the TMA (thus suggesting a large stabilizer).

The juggling of these two possibilities - the large stab/short MA vs. the small stab/long MA - fortunately has a definite and coherent history which can provide us with some valuable information. If you recall, we examined (in partII) some bizarre looking gliders with 7" nose gaps and 4" tail gaps, roughly the opposite of what we know today. These gliders, dating from the early thirties, were representative of the large stab/short MA era and we can only imagine that things were that way because that's the way things were. In those days long TMA was associated almost exclusively with racing aircraft and speed models, bearing out the rule of thumb that the faster the normal speed of the model the longer the TMA. Thus the ultra slow HLG, like its full-scale counterpart, the sailplane, was short coupled.

Nonetheless in the decade 1935/45 the long TMA revolution took place and became fully established. It was unquestionably a major factor, along with polyhedral, in the sudden jump from sub-minute to 1:10-plus times. It was found that the long fuselage extention to the rear of the wing was not all that disadvantageous. The long tail boom could be made slender in the interests of resiliency and thus be kept quite light. The long TMA was also a welcome visual revolution as well according to Pete Nishanian. It accentuated the tail-hang-down-drag of the true indoor glider as it loafed through the air.

Salient Stabilizer Specifics

There still remain a good number of factors bearing on the design of the stabilizer. In general what applies to the wing and its design can serve as a guide for the stab as well.

Planform: For the sake of appearance, and in order to achieve a sense of unity in the design, it is not uncommon to carry the wing planform over into the stab. If the wing is elliptical, parabolic, or something similar in shape, there is little or no problem. Where the wing planform is less conventional it may prove a little more difficult to achieve harmony in this respect. The Sweepette is an excellent example of maintaining the spirit of the wing planform in the stab yet varying the stabilizer planform in such a manner so as to make it both structurally sound and attractive at the same time.

Aspect Ratio: Higher A/R is just as desirable in the stabilizer as it is in the wing, especially when using a lifting section. Bill Dunwoody seems to feel that an increase in stabilizer A/R has adverse effects on recovery but this seems a negligible point and one overshadowed by the likelihood of a little increased performance. The practical limit to stabilizer A/R is, of course, structural. Nonetheless I feel that the small additional amount of weight entailed (agrrr!) in increasing the A/R of the stab might be offset by performance gains.

Section: If the stab section is symmetrical the maximum thickness around the 35 to 40% mark should give the least drag. If you use a lifting section simply pay heed, on a reduced scale, to everything that applies to wing airfoils. As a general rule a thickness of about 1/16" should do quite well for gliders weighing 3/4 of an ounce or more. On gliders weighing in the neighborhood of half an ounce 1/20" stock should be adequate and for those around 1/4 ounce, 1/32" sheet. This is ultimately a matter of feel more than anything else and "what the traffic will bear" is determining factor #1.

-Hedral: The proponents of both dihedral and negative dihedral make reasonable claims for these variations, stating that such angling aids in recovery or in thermaling. My own experience has proved nothing either way; but it is certainly easy enough for anyone interested to experiment and come to his own conclusions. Chop off one side of the stabilizer, reglue it at the desired angle, and note the difference in performance.

A dihedralled stabilizer leads us in the direction of the "V" tail. This is possibly a rich area for the experimenter. To cast off on this strange sea will undoubtedly mean shedding a lot of well established ideas of HLG design and adjustment and experimenting at considerable length. But if the results are anywhere near as encouraging in HLG as they have been in full-scale sailplanes where the "V" tail has proven to be a considerable asset in several respects the pioneer will be richly rewarded.

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." SEPTEMBER 1962

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

Two more members joined NIMAS in August, bringing our membership to the century mark after eight months. We welcome these new members:

CARL W. FRIES, 8798 Sturdy Drive, Crestwood 26, Missouri
DONALD R. GOLDBERG, 1706 Foxchase Dr., Reynoldsburg, Ohio

Our one hundred members are scattered over five countries and eighteen states of these United States. Over half the Open indoor records and many of the Junior and Senior records are held by NIMAS members; over half the top five places in the 1962 Indoor Nats were won by NIMAS members and NIMAS made a clean sweep Open Paper Stick and Open Cabin. In addition we took three of the top five places in Open IHLG and nine out of ten places in Open Indoor Stick. How 'bout dat!

RULES?

So far there has been no word of any further action on any phase of our rules changes that are pending - it seems that we are hung again on complete inaction from the higher echelons of the F/F Contest Board.

AMA Elections

It is now just a very short time until we elect new officers to represent us in every phase of AMA official business. As soon as possible we should carefully consider the qualifications of the nominees for each office and make sure that the best man rather than the most popular one is elected to each office.

NEW STAFF MEMBER

We are greatly indebted to considerable help from a very cute young lady with this issue - in several places. Mailing labels, proof reading, grammar correction, and now some illustrations in this issue. If all the extra work doesn't scare her off, she soon will become a permanent member of the staff. Already her indoor models threaten to shame your editor off the floor!

****FAI INDOOR REPORT****

Late last month the Society of Model Aeronautical Engineers (British A.M.A.) announced the following entries in the second World Championships for Indoor Model Aircraft, to be held September 22-23 in Cardington aerodrome near Bedford, England:

FINLAND	1.	Esko Hamalainen	Manager:
	2.	Harri Raulio	Reino Hyvarinen
	3.	Arto Tauria	
GERMANY	1.	Max Hacklinger	Manager:
	2.	Karl-Heinz Rieke	Gunter Maibaum
	3.	Klaus Hewell	
GREAT BRITAIN	1.	Ron Draper	Manager:
	2.	Reg Parham	Bert Spurr
	3.	Ray Monks	
HUNGARY	1.	Zoltan Oscodi	Manager:
	2.	Antal Egri	Reszo Beck
	3.	Geza Varszegi	
U. S. A.	1.	William Bigge	Manager:
	2.	Carl Redlin	Joe Bilgri
	3.	Dick Kowalski	
NEW ZEALAND	1.	John Malkin (Proxy flown by E. Thorpe)	

Previous issues have reported the qualifying times for the teams of the United States and Finland, and no flight times are available for the Hungarian team. The qualifying times for the other teams are:

GERMANY — Westfohlenholle, Dortmund, Germany (75')

1.	Max Hacklinger	25:16
2.	Klaus Hewell	24:42
3.	Karl-Heinz Rieke	21:25

GREAT BRITAIN — Cardington aerodrome, England

1.	Ron Draper	61:27 (2 flights)
2.	Ray Monks	61:08 "
3.	Reg Parham	58:55 "

PROXY OR NOT?

Last month we reported on the initial effort to keep John Malkin's proxy entry in the World Championships from being accepted. Since then we have received reports that this issue had only been discussed by a minor committee of the C.I.A.M.

At this time it appears that a close watch should be kept on the proxy flying situation. Possibly we should be concerned that the matter is being discussed at all; certainly we should be prepared to arrive at a definite conclusion on whether we want proxy flying to be allowed in future years. From this vantage point it seems that we would lose a great deal in international flavor and spirit if proxy were eliminated. And if it is eliminated some time in the future, we should insist that at least one calendar year should elapse between the decision and final adoption of such a move. In all fairness, however, it seems that there really is no question about whether proxy should be permitted - without it only the wealthy or the state subsidized teams can participate.

****SUMMARY - FAI INDOOR ELIMS****

In a well planned and well executed system of elimination contests, ninety entrants of FAI local events flew against the stiffest competition on record. In the six quarter final contests, forty-one flyers qualified for entry in three semi-final elims. In the third round thirty-seven entrants were narrowed down to our present team in one of the hottest competition events yet seen. The entry breakdown is as follows:

The entry breakdown for the local elims is as follows:

WEST COAST		CENTRAL AREA		EAST COAST	
Los Angeles	10	Chicago	14	Lakehurst	9
Moffet	13	Cleveland	18	New York	7
	23	Dallas	8		16
		Detroit	10		
		Kansas City	1		
			51		

The latest tally of money collected as a result of the FAI Indoor elimination system shows that $368.50 was collected - quite a healthy piece of change from a phase of model flying that was "dead" a few years ago!

All of us who participated in the FAI indoor program this year owe a big vote of thanks to Joe Bilgri, Dick Kowalski, and Richard Miller for the planning, and to all the CD's who ran the meets, and to all the helpers who made each meet a success.

Although we have no indoor championships in 1963, we can and should start planning toward eliminations for the team for 1964. There is enough activity to hold at least one more elim on the West Coast, and at least one more in the East. For the benefit of flyers in the Central Area, planning should begin now to find and activate a site nearer to the geographical center of the Central Area. In 1961 none of the flyers who qualified in the South were able to get to Detroit for the semi; in 1962 your editor was the only qualifier from the South who made the trip.

STATE OF THE ART

Although the purpose of this column has been to report on models which have established a new national record, it will also be used to report other noteworthy developments in this field. In months to come we hope to show three-views of leading FAI models from all over the world, as this info becomes available. This month, however, we present models developed for a proposed event that never was adopted, to show once again that model builders need no more incentive than curiousity to tackle a project.

The event, solid stick class B paper covered models, proposed to eliminate all bracing, rolled tubes, and all "special construction techniques" and develop a beginner class of model. It becomes obvious that a 100 sq. in. unbraced model is no beginner project after you try one, and it is next to impossible to define such a model with rules that a beginner can read and still cover loopholes.

At least two flyers developed models for this class, Hal Cover in California and Charlie Sotich in Chicago. Hal's model has been flown in Wilmington (29' 11") for a time just under 8 minutes, and for 10 minutes in Moffet hangar. However, Hal feels that 14 minutes is a possible upper limit of duration for Cat. III. He reports some occasional trouble with the wing L.E. tucking under and that the solid boom sometimes twists in flight. With a weight of .060 oz. the limiting factor seems to be motor stick strength - .060" rubber is the largest practical.

Charlie's model shown here is the second he built, with the first having straight tapered wings and stab. Some trouble with wing tucking was experienced with the straight wing, but this was the only difficulty. The best time with the straight wing configuration in Madison Street Armory (75') was 12:22.

The wing shown was laid out by the parabolic development described by Ray Harlan in Zaic's '59-'61 Yearbook. The new configuration seems to have cured wing tucking and boosted the best time to 13:10 in the same site.

RECORDS? MAYBE!

There have been no reports of any record applications in our mail box this month - but there have been a couple of record trials held since the last reported date in the August issue. Until, just before press time, when we received our new Model Aviation, we had assumed there had been no records set.

Now we see that the following records were established in one of those record trials:

Open Helicopter - 8:11.0, Hal Cover	7/29/62
Open A R.O.G. - 21:52.0, Joe Foster	7/29/62

On this one we goofed - we were notified of the application, and erroneously understood it to be less than an existing record which wasn't so:

Junior Ornithopter - 0:20.0, Steve Houlihan

QUESTIONS AND ANSWERS

This month we have three new questions, the first on the previously discussed topic of model efficiency and the other two new topics - but all open to comments and suggestions from all sources:

18. Assume a model strong enough to handle full power without the flight surfaces warping or twisting under flight load: what flight adjustments or method of trim will give maximum flight effeciency (duration vs. power) for that model, without making major structural change?

19. Does anyone have a sure-fire method to prevent the rubber from creeping off the prop hook?

20. What kind of boxes or containers are best for storing and transporting indoor models, including the factor of maximum utilization of space?

Question #20, containers for indoor models, presents one of the more neglected aspects of our hobby. An ideal model box will offer maximum protection for the model, easy handling and storage of the box, and easy access to the model when it is time to fly. Needless to say, there are about as many different solutions to this problem as there are flying groups, plus a few.

Any box which is easy to handle and store usually is fairly light, small enough so it is not awkward to carry, and will fit easily into vehicles for transportation. The small dimensions will only be acquired by having the box well filled so there will be mimimum "dead space" consistent with easy access to the model parts.

When the protection of the model is considered, this includes protection from dust, atmosphere(humidity), and shock from handling and transportation of the model. Dust and humidity protection suggests that the box will be air tight or nearly so, and shock protection includes careful mounting of the model inside the box.

Easy access to the model at the site implies that the box will open wide enough for easy removal of the model parts and simple but reliable mounting devices which will hold everything in place properly. Proper mounting means that each component is held in such a manner that it won't come loose by itself and that "G" loads from road bumps, accidental dropping of the box(horrors!) and bumps from handling will not damage the structure. Easy access also includes room to put your hands into the box to engage and release the fasteners if this is necessary.

Most of the various boxes for indoor models can be divided into two categories: "unit" boxes which hold no more than two models and usually only one, and multiple boxes carefully engineered to hold a large number of models of various classes. The hand launch glider flyers are almost unaminous in using a multiple box, sometimes with elaborate mounting arrangements for each model.

Almost all the boxes are constructed from either wood or cardboard, with cardboard seeming to be in the greatest use. Wooden boxes, carefully designed, are strong and durable and will give the most protection from atmosphere and dust if equipped with rubber sealing strips. However, unless one has access to wood-working equipment and is quite talented in using the machines, wooden boxes are usually quite expensive. Also, wooden boxes hit harder when they are dropped, are heavier to carry around, and usually are more awkward since the large investment tends to ensure that many models will be stored in each box.

Cardboard boxes are used (we suspect) much more often than wood because suitable boxes can often be found free if you beat the trash man to them, and cardboard is easy to work with. Here again, it takes careful planning to ensure air-tight construction and maximum utilization of space (new-found boxes almost never fit your models). On the minus side, cardboard boxes are more susceptible to puncture damage, and usually will not stand to have weight piled on them. They also seldom are waterproofed, and will hold moisture longer, and thus are subject to replacement more often.

Although we suspect that both types of boxes fill a definite need, our personal preference is for the unit box. A unit box, carefully tailored to the model size, (or conversely, the model designed to fit the box) makes maximum space utilization, exposes only one model at a time to danger, and permits one to leave unwanted models at home. If transportation is a problem, (it usually is) unit boxes can be stacked in a variety of arrangements so that many models and people will fit in one car.

For example, a recent excursion to a Cat. I session found five people, four gliders, eight Easy B models, and one B paper stick stashed in a '57 Ford sedan with room to spare. On the way to the Nats, the same car held two people and their clothes, two stunt models, two FAI models, four B paper stick models, one B stick, one Easy B, and complete repair facilities including bracing jigs. On the return trip another FAI box and assorted junk was added, all without impairing vision out the rear window!

The size of a proposed box is difficult to determine whether it be a unit box or a multiple one, but adequate space for many models in a large box takes quite a while to arrange. For unit boxes the length is usually just a bit longer than the wing span, the width just longer that the stab, and the height about two inches taller than the wing posts plus the dihedral. In this type of box the wing is mounted in sockets by the wing posts and the fuselage/tail group is mounted in U-shaped brackets and locked in. Props are mounted on individual hooks on the sides of the box (with safety catches) or the hubs are mounted in brackets with fasteners on the bottom of the box.

Clarence Mills (Chicago) showed us how he changed the wing mounting in a unit box so that two models would fit the same box and the wings could be installed and removed from the box more easily. He simply mounted the wing in sockets on a strip of 1/2" x 1/2" balsa as before, but instead of fastening the strip to the bottom of the box, he mounted a bracket on the side of the box and slipped the mount strip in vertically.

Now, the wing mounts on the side of the box, leading edge down and the top of the wing facing the center of the box. This leaves room for another wing on the other side of the box, and there already was enough room for another fuselage in the bottom of the box. Props can be mounted on either side of the wings and on the bottom of the box, or can be carried in a separate box.

Unit boxes, in order to afford maximum protection to the model, should be constructed similar to a shoe box, that is with a completely removable one-piece lid which is a snug fit on the bottom. The flaps in the bottom and the lid should be covered with another layer of cardboard ...ed in. If the lid is made the same depth as the box, ...s will result in a double thickness of cardboard all ...ound the model, and greatly increases the strength of the box. The box will then resist crushing from any direction and will support considerable weight if it is necessary to pile stuff on it.

Under no circumstances should flaps be used as a top for the box. Flaps admit dust and moisture, endanger the model during removal, and will not support any weight on top of the box. They can also open up accidentally and submit the model to air currents - scrambled model!

Unit boxes of the type described can be made fairly easily, starting with larger boxes and cutting them down, or building from scratch with fresh cardboard. However, some container manufacturers will make such a box in job lots for about $4 - and for less than $3 in large numbers. The problem would be to get a group of fellows to all agree on what size the boxes should be!

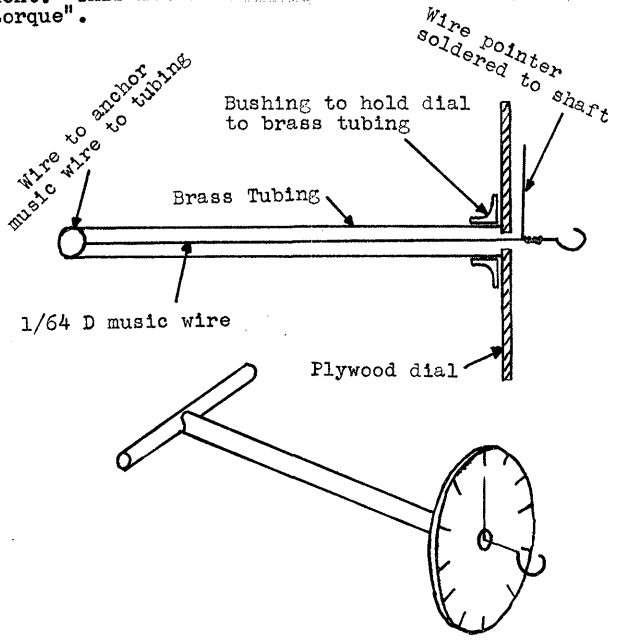
HINTS AND KINKS

Torque Meter

This torque meter, designed by Charlie Sotich, is intended to use for checking motors during the break-in to see if the rubber meets some arbitrary standard met by a motor you have used in the past. The construction and calibration goes as follows:

"It consists of a piece of 1/64" dia. music wire 6" long inside a piece of brass tubing. The wire is fastened in the back of the tubing by soldering it to a piece of 3/64" wire perpendicular to the brass tubing. A pointer is soldered to the other end of the 1/64" wire and a hook is bent in the end of the 1/64" wire also. A bushing soldered to the brass tubing holds a plywood dial which is graduated during calibration.

I calibrated the torque meter by fastening a 24" ...iece of 1/8" sq. balsa to the pointer (centered). I then moved a .1 oz. weight along the 1/8" balsa in 1" increments thus: move the weight to the 1" position, rotate the meter until the beam is horizontal, mark the pointer position on the dial, and repeat for each 1" increment. This meter will calibrate to about 1 inch-ounce of torque".



NEWS FROM AROUND THE WORLD

ENGLAND

After having firmly established himself on the team, at the British elims, Reg Parham started testing John Malkin's FAI model. Reg has been taking care of the model since its arrival in England, but it will be proxy flown for John by E. Thorpe.

FINLAND

The Finnish team attended the German FAI elims to get some experience in a higher ceiling. Generally low times prevailed due to turbulent air most of the day. It was valuable experience for the Finns, since the less-than-ideal air showed up weak points in their ships. Esko Hamalainen reports that he is changing over to the same wing construction as the Germans are using - a stressed wing which has greater strength to weight.

CALIFORNIA

Although the Wilmington sessions remain as record trials with Easy B events, interest is growing rapidly in indoor flying scale. Vic Hardin is the CD responsible for the growing scale interest, and is assisted by other members of the Flightmasters.

An added attraction - Lew Gitlow will hold classes in indoor building at all future Wilmington contests!

INDIANA

Chuck Borneman's group (Kokomo Knights of The Round Circle) has already started plans for regular indoor activity starting in November. Last year this group, flying at Bunker Hill AFB, had the only organized indoor activity in the state. For more info, contact Chuck at 1401 West Taylor, Kokomo, Indiana.

NEW ZEALAND

Flying sessions at the Vogue Theatre continue amid rumors that two other sites in New Zealand may soon open up. Times continue to climb, with John Malkin picking up a new Cat. I record with his Easy B - 7:12.3. John had almost broken the 6:19 set by Brian Roots on two previous occasions, and is now shooting for 8 minutes.

TEXAS

Although the Walnut Hill site in north Dallas still resists attempts to increase the high time above 9:08.5, the E-Z-Bee class times still are climbing. Hotshot class record is now 6:41.5 in Open, set by Bud Tenny. Don Chancey upped the Junior Hotshot record to 6:01.2. Don currently holds the IHLG record for the site at 0:25.0.

The September 21 session is the last regular session until after the basketball season, and there is a trophy set up for the high time of the last three sessions. So far the E-Z-Bee models are likely to claim it, but there are several models being readied for a real crack at a new site record.

FUN MODEL REPORT

Quite some time ago Wally Miller designed a small indoor model for his son to build - and created one of the most significant promotional devices ever used for our hobby. That original Easy B, as Wally's model was called, sparked the brainstorm of holding regular events for "formula" models.

The Easy B class, as flown in Wilmington Recreation Hall in Los Angeles, made an excellent event that everyone could fly. The novices and beginners flew it since the models were easy to build and lots of fun to fly. The experts flew it - Gitlow, Finch, Miller, Copple, and others - because a total washout of a model still cost them only a few hours. No matter what the level of the flyer's experience, the Easy B class presented a big challenge.

The challenge of a simple model might be obscure, until you try it. When two people compete with Easy B models, the challenge is between the flyers, and the formula evens out the score until it is almost 100% skill of building and flying. The possibilities for development and experimentation are limited only by the imagination of the flyer - and the resulting models are almost a perfect match for Category I sites.

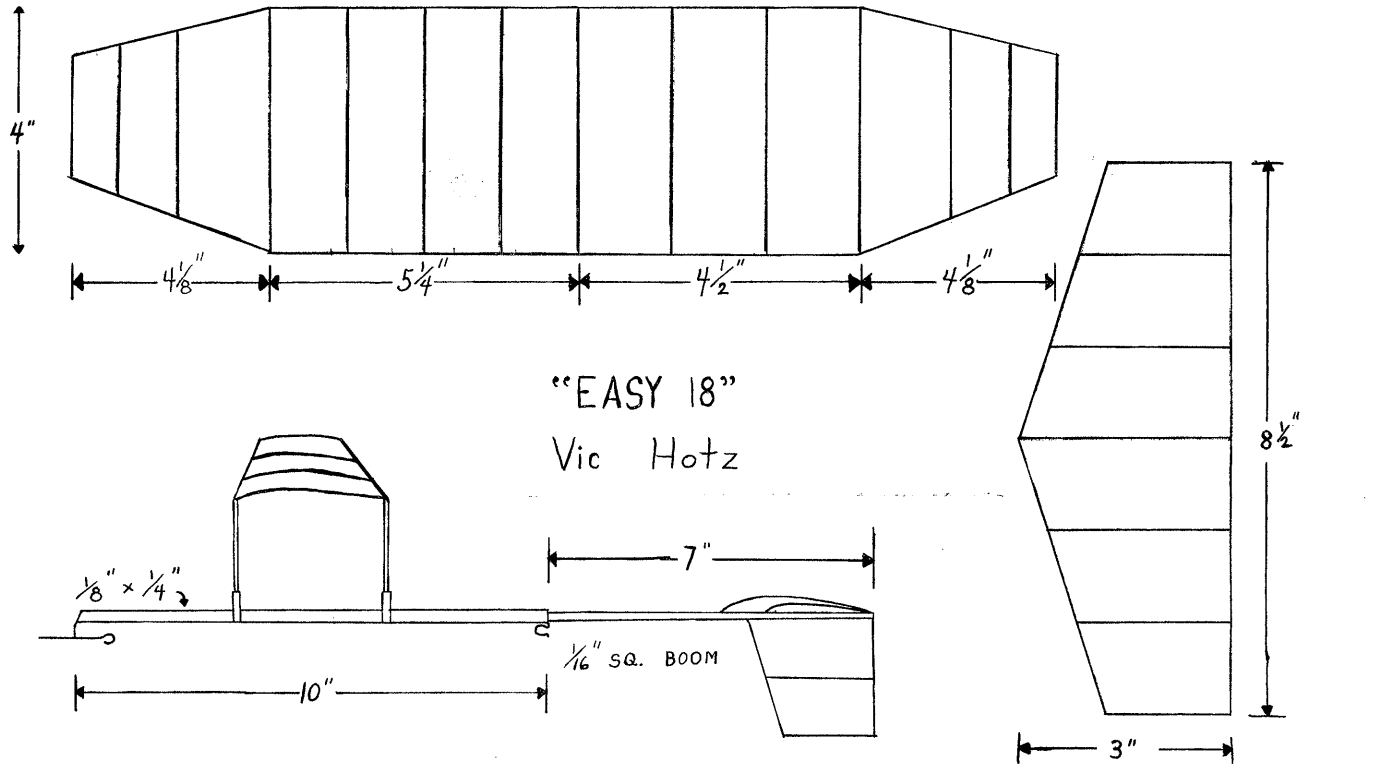
In just about two years the Easy B and many different variations have spread all across the world. Chicago, Dallas, Kokomo, Kansas City, New York - even in Upper Hutt, New Zealand the "fun models" have become popular. All of the present New Zealand indoor records in their brand new Category I are held with Easy B models.

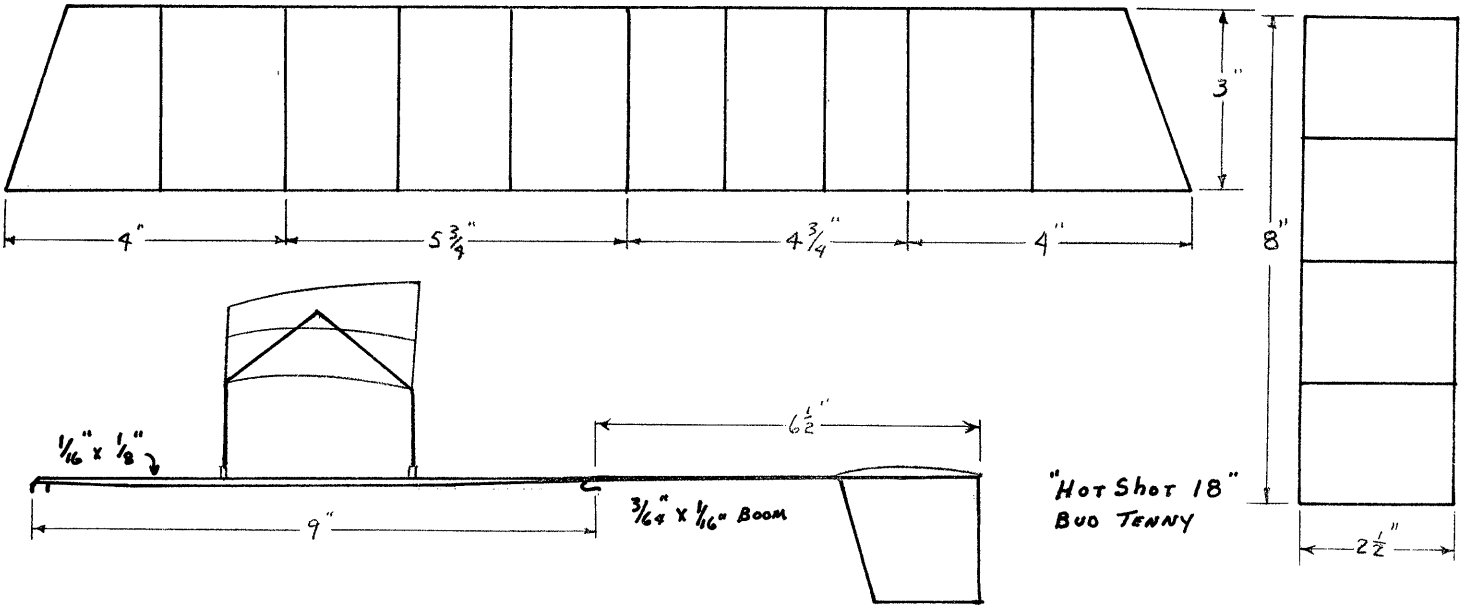
What is this magic formula? In the simplest form, it is a maximum wing span, maximum chord ruling coupled with requirement for an all-balsa prop. The original Wilmington formula was: All outlines must be straight lines, all components solid, no bracing, all-balsa prop, 18" maximum span, 3" maximum chord, maximum stab area 50% of wing area. Covering could be either paper or microfilm, and the novices usually started with paper.

In New Zealand the full Wilmington formula was adopted for the flying in the Vogue Theatre. In Chicago, the IMAC flyers eliminated the maximum chord and tail area rules, and specified paper covering. The winner, Vic Hotz's Easy 18, is sketched on this page. A 9½" x 15" prop and a 16" loop of Pirelli supplied the "go" for 6:57 in a 75' ceiling.

In Dallas, the flyers had the most leeway of all: the 18" x 3" wing was specified with an all-balsa prop. The covering for the Novice class was limited to paper, and the Hotshot class was no holds barred. The complete simplification was an experiment to see if great inequalities resulted from loop-holes in the rules. So far, they have not - the Novice models are of the simplest construction and the expert "Hotshots" tend to build miniature indoor models complete with bracing and sometimes rolled motor sticks. Since it is expert against expert, no one stays on top for long, as it should be. The model which holds the building record for the Walnut Hill site (20') is shown below. The top time for this model is now 6:41.7, and the limitation on higher times so far has been drift. Power for the record flight was a 12" loop of .040" of Pirelli turning a 9" prop with blades mounted on the spar at 45° and a slight helix warped into the blades.

If you have a thriving group of avid indoor flyers, all of them gung-ho for contests and record trials, the "formula" model probably will do little for you. However, if you are a lone indoor flyer or have a small group and need more activity to justify the use of a site, this is the way to get more flyers. The fun models are simple enough that no model builder will admit to being unable to build and fly them, and beginners can build them with very little supervision. Combine a fun model contest with a record trials and the expert flyers can make their record attempts and the other entrants will make up the minimum of ten entrants to qualify the event as a record trials. That is, the experts will make record attempts <u>if</u> they can let the Easy B's alone long enough!



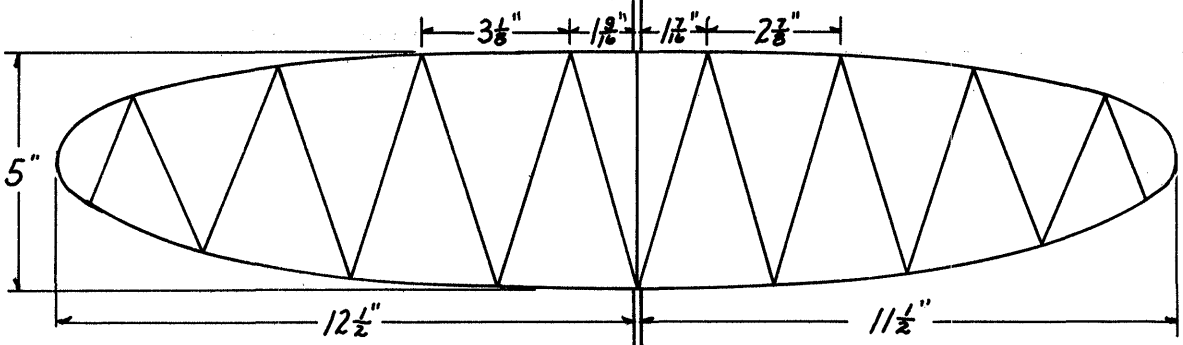


PROP
13" D - 24" P SINGLE SPAR
POWER
17" LOOP .080 PIRELLI

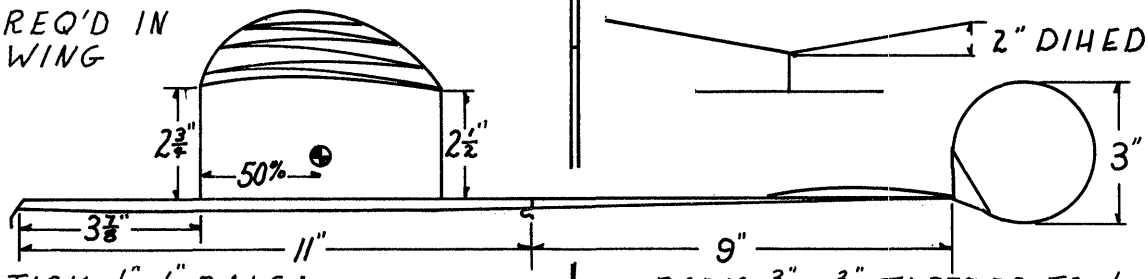
P.

WEIGHTS

WING	.025
STAB	.0074
FIN	.0013
MOTOR & BOOM	.026
PROP	.0106
TOTAL	.0703



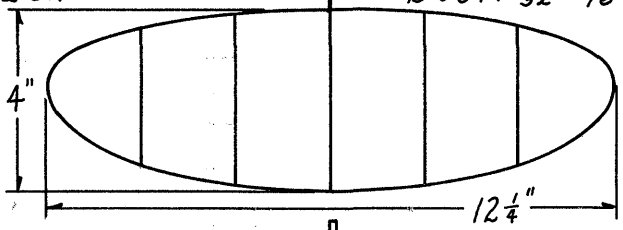
WASHIN REQ'D IN LEFT WING



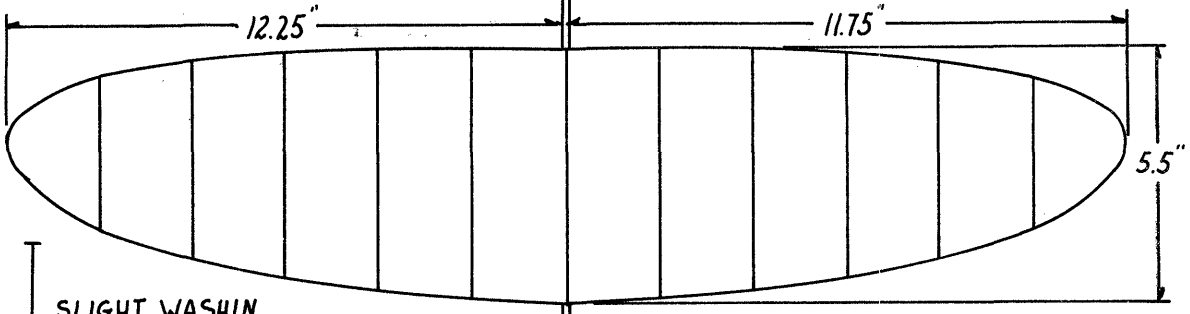
MOTOR STICK 1/8" x 1/4" BALSA

BOOM 3/32" x 3/16" TAPERED TO 1/16 x 1/16

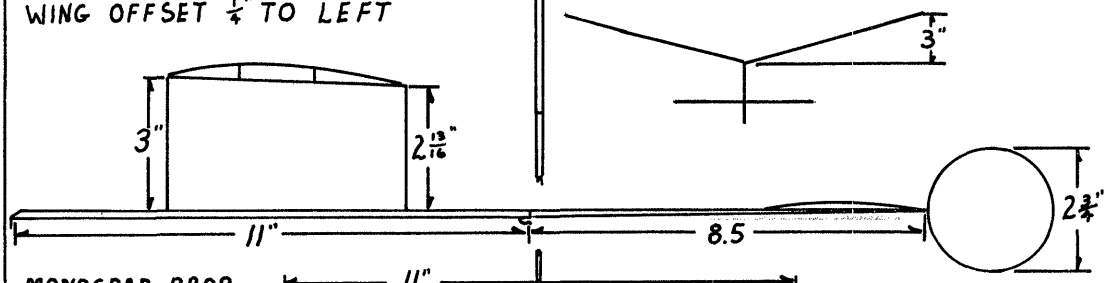
DESIGNED & FLOWN
BY CHARLIE SOTICK
CHICAGO, ILLINOIS
3-17-62



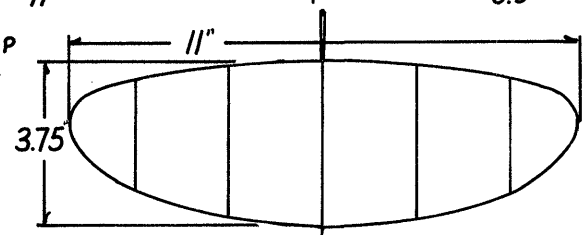
SOLID-BODY UNBRACED
PAPER STICK
75' CEILING - 13:10
WING 99 SQ IN.
STAB 38 SQ IN.



SLIGHT WASHIN
WING OFFSET 1/4" TO LEFT



MONOSPAR PROP
13" DIAMETER



UNBRACED TISSUE STICK
MOFFETT FLIGHT TIME - 10 MIN.
POSSIBLE TIME - 12-14 MIN.
DESIGN - HAL COVER
DRAWING - LEE POLANSKY

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." OCTOBER 1962

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

OFFICIAL RESULTS - WORLD INDOOR CHAMPIONSHIPS

Cardington, England September 1962

									Total
1.	REIKE, Karl-Heinz	Germany	41:39	43:08	45:40	38:50	39:19	-	88:48
2.	HACKLINGER, Max	Germany	34:13	37:42	42:40	36:34	43:37	39:38	86:17
3.	REDLIN, Carl	U. S. A.	38:43	34:23	45:17	34:33	27:05	37:40	84:00
4.	DRAPER, Ron	G. B.	40:44	:07	24:50	33:55	35:48	25:33	76:32
5.	HEWEL, Kalus	Germany	30:03	35:07	33:54	:18	25:09	32:03	69:01
6.	MONKS, Ray	G. B.	28:31	33:03	21:26	26:51	34:36	32:50	67:39
7.	HAMALAINEN, Esko	Finland	32:57	34:05	12:28	:19	-	-	67:02
8.	EGRI, Antal	Hungary	32:25	34:01	30:57	17:58	22:16	25:35	66:26
9.	VARSEGI, Geza	Hungary	16:36	27:12	30:49	23:33	23:30	28:20	59:09
10.	BIGGE, William	U. S. A.	8:17	30:21	21:19	25:11	9:21	28:08	58:29
11.	MALKIN, John (Proxy: E. Thorpe)	New Zealand	19:25	22:01	28:03	24:53	25:04	24:09	53:07
12.	PARHAM, Reg	G. B.	26:44	23:54	25:46	11:26	19:37	25:20	52:30
13.	KOWALSKI, Dick	U. S. A.	32:46	11:39	18:25	19:33	11:31	-	52:19
14.	RAULIO, Harri	Finland	22:56	17:53	27:23	1:03	1:03	14:55	50:19
15.	TAURIA, Arto	Finland	:06	10:31	27:04	:07	23:13	7:29	50:17
16.	OSCODI, Zoltan	Hungary	15:04	:25	23:01	17:10	:10	:34	40:11

TEAM STANDINGS

1.	GERMANY	244:06	4.	FINLAND	167:38
2.	GREAT BRITAIN	196:41	5.	HUNGARY	165:46
3.	UNITED STATES	194:48	6.	NEW ZEALAND	53:07

We are very much indebted to Reg Parham for his air mail delivery of the results right after the end of the contest; and to C. S. Rushbrooke for sending the official version as soon as it had been prepared.

A careful scanning of the results above yields some interesting information: First, there were seven flights over forty minutes, and two of them were over forty-five minutes. Just a few short years ago very few people had flown for longer than thirty minutes, and now the new mark is just 50% higher!

A second observation from the results points up the rather high degree of consistency showed by the teams of all countries.

Something that doesn't show on the score sheet is which of the two high flights came first. This info is given in the commentary by Arthur Barr with his summary of the "most fabulous meeting of all times":

"Firstly, conditions: practically perfect. Although rather cold, very little drift - Saturday being the better of the two days. Organization was good with three time-keepers to each team who had to get in three flights on each day. The first forty minute flight was put up by Ron Draper (a new British record) and this really set the pattern of the meeting; with both Rieke and Hacklinger aiming really high with their most efficient models. There was no doubt that the German team's aeroplanes were most consistent as seen by the results; with approximately 2000 turns and 45 RPM it was obvious that they were really good.

In spite of this, they were being pushed hard, particularly when Carl Redlin came up with a terrific flight of 45:17, the first to break the 3/4 hour mark. This was quickly followed by Reike with 45:40, and it was reasonably settled by this time, that with two other flights over 40 minutes the others would really have to pull something out of the bag to catch him. Both Carl and Max tried really hard in their last flights to do it, but it was not to be.

Dick Kowalski started off very well with 32:46, but from there on was plagued with atrocious luck; he had two collisions when well set for 35 to 40 minutes, suffering damage. One outstanding memory was Bill Bigge, having hung up, climbing out over the girders from a side catwalk, calmly taking his rubber motor off, stowing in an envelope, then gently launching his airplane to glide down from some 120 feet. Many hearts were in mouths.

Both the Finnish boys Raulio and Tauria, in spite of their inexperience, worked really hard to get their flights in, having suffered damage in earlier attempts, but did remarkably well. The New Zealand model of John Malkin's was ably flown by proxy Ernie Thorpe, assisted by Reg Parham.

With Carl's and Reike's last flights being made during the closing stages of the contest, everyone was gathered around the scoreboard anxiously awaiting the final results, although there was no doubt as to the winner; and so ended a most memorable contest."

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

Two more indoor flyers joined NIMAS in September, to bring total membership to 102.

JAMES E. GAFFNEY, 15004 Grapeland, Cleveland 11, Ohio
HARRY E. HARPS, 2837 Minto Drive, Apt. 16, Cincinnati 8, Ohio

The November issue will be the twelfth issue since INDOOR NEWS AND VIEWS was nationally published, and all subscriptions taken out before the middle of December were officially started with the December issue. Next month there will also be a statement of income and all expenses incurred to date.

RULES?

We regret to inform our membership that there apparently has been absolutely no action by the free flight Contest Board on any of many indoor rules proposals. Some of these proposals have been "pending" since 1960; some of them have been in the hands of two different CB Chairmen without ever having been circulated to the Board for preliminary vote! With the present rules-amending schedule, it is almost too late to get these proposals "into the mill" for consideration in time for publication for the 1964 rules!

NIMAS is currently considered as (unofficially) an advisory organization with regard to indoor rules, and it is felt that NIMAS and similar organizations should at least become official advisors with regard to rules for the special field of each organization. At one time, certain high official circles felt these organizations could and should become responsible for their own rules.

At one time your editor was optimistically in favor of NIMAS having responsibility for the indoor rules, but the somewhat lackadasical response to the first NIMAS ballot somewhat cooled his enthusiasm for this project. Perhaps the response would have been better if there had been more at stake, perhaps not.

Our present problem, and a thorny one at that, is to press for action on all pending indoor rules legislation with enough vigor to make our voices heard. With the present rules machinery, we have absolutely no recourse when the CB Chairman ignores his duty to keep things rolling; in turn, the Chairman has no recourse if several CB members fail to answer their mail on rules queries from the Chairman.

We therefore urge that each NIMAS member contact the AMA VP for his area. outline the problem, and urge that he investigate the matter. Send a copy of your letter to the CB member for your area, and one to AMA HQ. Then, drop us a line outlining your own feelings on the matter so various ideas can be aired.

To summarize the magnitude of inaction we have decried in previous paragraphs, here are the proposals in question:

DETROIT-CHICAGO-WILMINGTON Proposals

Proposal "A" (IHLG) - Submitted for preliminary vote along with three others, no further action taken after CB members returned comments.

Proposal "B" (Scoring IHLG) Not submitted yet.

Proposal "C" (FAI Indoor) Not submitted yet.

Cliff Model Club IHLG Proposal - Same as Proposal "A"

Skyscraper's Proposal (IHLG) - Same as Proposal "A"

Hatschek's Proposal - Submitted with other IHLG proposals as composite alternate.

Solid Stick Proposal - Originally passed, recalled due to not being published in Model Aviation as required in the Rules Revision Guide; there have been enough negative CB votes to reject it this time around, but a full CB vote has not been called.

****AMA ELECTIONS****

Just over two months from now it will be too late for AMA members to return their ballots to elect officers for 1963 - even though the ballots haven't been sent out yet. In fact, the nominees for most AMA offices have not been officially announced, although precious little time is left for voters to decide upon the best qualified men.

The most important and influential office at stake, that of AMA president, has two nominees on the slate - John Worth and Maurice Teter. Beyond any doubt, each of these men was considered capable to fill the post, since each was nominated in good faith. Further, each man feels he can do justice to the job and presumably is aware of the extreme work load of this office, and so indicated by his acceptance of the nomination.

We have never met John Worth, and certainly have not heard anything but good reports of him, scanty though those reports may be. However, we do know Maurice Teter and feel obligated to make his qualifications and feelings known.

By far the most important qualification Mr. Teter has is experience with all facets of AMA business. Although Maurice has been a fierce competitor in the past, he has realized that high level administration and competition do not mix. Thus we find that 1948, his first year of administrative work with model airplanes, was the last year he entered a model contest.

Since receiving his Leader Member-Contest Director license in 1947, he has directed at least one Class AAA contest each year, and was active as contest director for Plymouth. He is an active Exchange Club member, serving on the Aviation Committee of the National Exchange Clubs. He has established two annual Class AAA meets in Texas, and is largely responsible for establishing the only permanent model park in Dallas.

On the national level he has directed the Nationals three times and is Chairman of the Nats Executive Committee which has total responsibility for planning the Nats each year. He has also twice served as Secretary-Treasurer of the Academy.

Mr. Teter has declined to express any detailed campaign platform, feeling the need to be better informed before promising solutions to several undefined but very real problems. However, he strongly feels that our rules revision procedure is in need of repair, certain fiscal aspects of the Academy need definition, that there should be better rapport between different geographical sections of the country, and that the FAI program needs to be brought into realistic perspective with the rest of the AMA competitive picture, especially with regard to representation vs. participation in the various events.

It is our personal opinion that Maurice Teter is very highly qualified for the AMA presidency, and has always demonstrated a high degree of personal integrity and a deep concern for the welfare of the AMA.

QUESTIONS AND ANSWERS

Last month question #18 asked for descriptions of flight trim and adjustments which would result in maximum flight efficiency of an existing model. Bill Tyler sent these comments:

"In addition to the specification that the flight surfaces will not warp or twist under power, you'd better add the assumption that the boom isn't floppy and that full power doesn't bow the stick too much. With those two additional qualifying factors in the assumption we can proceed with the discussion.

Don't test fly the model, test glide it! Attach a clay weight to the thrust bearing equivalent to the prop weight. Hook the motor (put enough turns in it so it doesn't sag or swing about) on the bearing. Try to test glide in dead air; launch from the same height each time and time the duration of glide. Once you've obtained maximum duration as a result of small changes in incidence mark the position of the wing struts in the tubes so you can duplicate the incidence setting. Then put the prop on and make the model fly at this incidence setting by using down thrust if necessary (use double thrust bearings for positive thrust adjustment). What you've actually done by test gliding is establish the ship's lowest sinking speed. This is the best adjustment for maximum duration under any circumstances. In high ceiling flying one can very easily be flying a ship out of adjustment and not be able to see it as the "flat" part of the flight occurs so high up you can't observe the model's flying speed or performance.

Power-off, power-on conditions of fully wound motors will cause high-wing ships to stall unless there is a certain amount of bend in the stick. This bend in effect increases the incidence of the stab at the beginning of the flight. Too much bend will make the model unflyable unless a brace is put on the stick and hooked to the end of the stab. This works in an emergency by the bracing wire pulling up the stab to compensate for the over-bend in the stick.

Stiffly braced sticks on high wing ships may cause stalls at the start of a flight even with some down-thrust added. Luckily most braced sticks have some bend so the problem isn't always acute. A power stall at the start

of the flight caused by a non-yielding stick can sometimes be controlled by moving the rubber knots forward before attaching the rubber to the rear hook. This moves the C. G. forward for the beginning of the flight, but it won't work on a really packed windup since the rubber is so tight it's like steel wire. (I've had ships wound up so tight the knots put holes through the bottom of my stick. Why the stick didn't fold up I'll never know. This happened on my paper B when it set a record of 22 minutes back in '56. Man, was that ship ever wound!)

On double bearings make certain that you don't glue them onto the stick so that you've built in right thrust into the model. This can be very disconcerting and has happened to more than one innocent builder.

Build washin into the inside wing panel while bracing as it's much easier to do at home than at a flying session. I favor offset center sections so as to keep the wing as "straight" as possible for less drag.

Depending upon your flying site and conditions, keep the flight circle as large as possible. Tight circling ships need more washin than wider circling models, and are harder to handle at the beginning of the flight."

Ray Harlan, also commenting on #18, has this to say:

"A lot depends upon the prop diameter and pitch, along with the ceiling height. Assuming the prop is not too large for the model's weight (so as not to allow it to be easily disturbed by gusts, convection currents, etc.) we would start with a motor equal to or slightly greater than the weight of the model (dry) and about 25 or 30% longer than the motorstick. I believe in quickly working up to enough turns to get the model 20-30 feet off the floor, with perhaps only one short flight to see that nothing radical occurs.

Regarding proper trim, one should attempt to fly the model just short of a stall, but not mushing, with turn to suit the site. The more nearly level the flight pattern (larger circle) is, the higher the efficiency is, in this case lift to drag ratio. Of course, small sites require tight turns to reduce girder hit probability. Level flight with turn can be enhanced with stab tilt.

Warps will either make or break a model. The wing should be flat except for the inboard panel (assuming tip dihedral) which has about one degree washin at the dihedral break. The rudder should be set to hold the proper turn, although I always augment it with just a little left thrust, more of a safety precaution to prevent right turn and stalls under power. The stab will sometimes need washin on the left side, along with tilt, to bring the model around in its turn under full power.

Thus, after the 20-30 foot test flights, in which cruise trim is set, turns can be increased by steps of 200 while power trim is corrected. Finally, the correct power is found, so that the model lands with just a very few turns left, yet cruises near the ceiling. Too much power shows itself quickly by taking the model high on low turns, and then deadsticking it, while too little power often plays inconsistent tricks, sometimes appearing fine, but later giving no performance whatsoever."

HINTS AND KINKS

Helium Source

Balloons have long been a necessary part of equipment needed to safely fly indoor models, and sometimes it is quite a bit of bother locating a source of helium or hydrogen to fill the balloons ahead of time. A portable source of helium would be the ideal solution, and would make "instant balloons" possible. You just inflate them as the need arises, in about three minutes per balloon.

Many chemical and laboratory supply houses stock small "lecture bottles" which can be purchased for about $10, $6 of which is a deposit on the steel bottle. These containers are about 12" long and 1 3/4" in diameter, and will fill about five average balloons to about 12" diameter. Since this is pretty expensive per balloon, these bottles can be used to supplement ordinary hydrogen generators and other balloon sources in cases of emergency.

Protection from Rubber Lube

Dave Call, one of the "old pro types" from the East Coast, makes the following suggestion to prevent indoor sticks from becoming lube-soaked:

"Pirelli rubber requires a great amount of lubrication. The motor must be quite wet. This will frequently get excessive lube on the underportion of the motor stick. To avoid any weakening of this portion of the stick, I've used zinc stearate (available at any drug store) carefully but thoroughly rubbed into the pores of the balsa for at least half its diameter. This is a bit of extra work, but well worth avoiding a collapsed tube. After a day's flying is over, wipe this area dry with kleenex or cotton. Viola! Dry stick, ready for the next session. The weight increase is negligible."

RECORDS? MAYBE!

We presume that the top flight time for each team at the World Championships will be accepted as a new record for that country, and that Karl-Heinz Reike's 45:40 will be confirmed as a new world record. A summary of those flights follow:

Germany - 45:40, Karl-Heinz Reike (World Record)
United States - 45:17, Carl Redlin (Cat. III Class D Stick, Open)
Great Britain - 40:46, Ron Draper
Finland - 34:05, Esko Hamalainen
Hungary - 34:01, Antal Egri
New Zealand - 28:03, John Malkin

From Dave Copple comes confirmation of two new records by Larry Reneger, flown at Wilmington in August:
CATEGORY I, Wilmington Rec. Hall, Los Angeles, 29'11"
Senior A ROG - 8:16.9
Senior B Stick - 10:38.6

NEWS FROM AROUND THE WORLD

CALIFORNIA

The Sky Hoppers of Orange County, spearheaded by Bruce Paton, have made a real breakthrough. For years indoor flyers have been seeking to use the blimp hangars at Santa Ana. A three-hour conference and demonstration resulted in monthly sessions for the Sky Hoppers with permission to have open AMA contests four times each year.

Although the quarterly contests are open to all AMA members, the monthly flying sessions are restricted to flyers who are both AMA members and members of the Sky Hoppers. However, the Sky Hoppers are opening club membership to interested indoor flyers outside the normal reach of the club.

COLORADO

George Batuik reports that indoor sessions held by the Martin Model Masters will begin in November, and will continue for five months. George can be contacted at 3066 South Osceola, Denver 19, Colorado.

HOLLAND

An inquiry after indoor information came from C. Wolthoorn of Rotterdam, after he read of NIMAS in AERO MODELLER. He related that the Dutch indoor record is 3:23.7, established in 1946. We sincerely hope that Mr. Wolthoorn will succeed in solving the many problems he will face in getting indoor started again in Holland. Anyone wishing to send words of encouragement can contact him at: Binnenrotte 110, Rotterdam-1, Holland.

MASSACHUSETTS

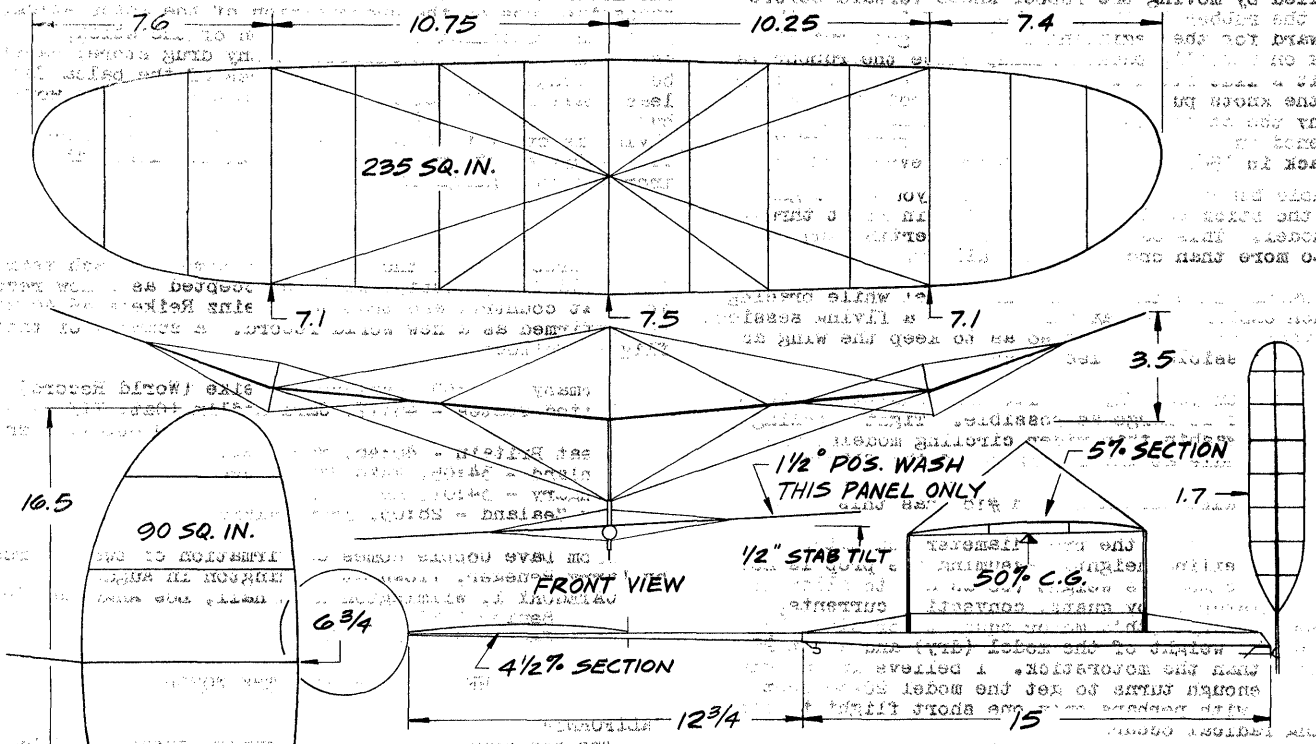
Ray Harlan reports that indoor activity is picking up in Boston, and that they will have monthly flying sessions in their 42' armory. Now that Larry Reneger has enrolled at MIT and joined the group, Ray sez that club members hold 7 records. For more info, contact Ray at:
71 Brighton Avenue
Allston 34, Mass.

DALLAS

The September 21 Walnut Hill session was scheduled to be the last until next spring, but the new winter schedule issued in September listed weekly sessions all through the winter - a real bonanza!

With a real nice trophy as an award for high time in the summer season, the September 21 session produced some startling times. In an exiting photo-finish for the trophy, the last two flights were 10:21.6 by Jody Brock, and 10:34.2 by Don Chancey. Both models were brand new class B sticks, and Jody's model was her first mike job.

The first weekly session, September 29, was plagued by drift that still didn't prevent Don Chancey from upping two site records: E-Z-Bee - 7:10, indoor stick - 11:30. Bud Tenny's "El Cubo" B paper showed good potential every flight and hung every time. Best flight - hung at 2:25, relaunched for a total flight time of 10:39.4.



WEIGHTS

WING	.0150 OZ.
MOTOR STICK	.0120
BOOM	.0025
STAB & RUDDER	.0040
PROP	.0085
TOTAL	.0420 OZ.

PROP SELECTIONS

20" DIA. 40" PITCH
20 " 39
20 " 38

FAI CONTENDER

DESIGNED BY
CARL M. REDLIN, JR.
DETROIT BALSA BUGS

STATE OF THE ART

Due to prompt action by Carl Redlin in furnishing the plans and to Chuck Borneman in making the tracing, we have the first model to break the 45 minute mark. Carl's comments were made before the World Championships, and were suitably prophetic, or so it seems!

Last year Carl's models had underslung rudders, and we asked for comments on the subject. Carl replied, "As for underslung vs. aft rudders, I can't see any appreciable difference in high ceiling performance. However, I can build an underslung tail combination lighter than the aft rudder combination plus the desirable feature of having the C. G. shifted forward slightly with the rudder on bottom. The only reason I went to the aft rudder is because they take up less space in the indoor box, simple isn't it.

My props this year are lighter by .0015 with more flexibility (increasing pitch under high torque). Although the best time I've been able to reach this year has been just around 37 minutes, I feel the ships are capable of more when fully wound."

THE HAND LAUNCH GLIDER

PART TEN

By RICHARD MILLER

DESIGN (cont.)

The Rudder

With the stabilizer designed and in place we can move on, once again in the order of importance, to the rudder, or vertical fin. Actually the rudder is a much better candidate for the analogous role of jockey (mentioned in Part 8) than the stabilizer is, for while the stab aids the wing in determining that the glider flies, it is the vertical fin, or rudder, which chiefly determines where it goes and how it gets there. Yet despite this versatility, rudder design, for the majority of modelers, consists of nothing more than trying to adorn the tail end of the fuselage with the pleasantest shape possible.

Of the numerous considerations in regard to rudder design - and there are many of them - that of size is unquestionably the most important. As is the case with the stabilizer absolute rudder size as such is of little importance: a big rudder is no more a big-enough rudder than a big-enough rudder is a big rudder! It is the effectiveness of the rudder as a steering and stabilizing mechanism which concerns us and this is a product of its moment arm as well as its size.

Up to this point we have pretty well followed in the tracks of the stabilizer; but now we part company. For when it comes to the determination of how much rudder effect (which we'll simply call "rudder" for convenience) is desirable there is only one serious School of Thought: The Least Possible School of Thought. To all intents and purposes the rudder should be as small as possible commensurate with the demands of stability. The only real problem which confronts us is determining how much that little bit is.

In light of the number of complicated factors which bear on the problem it would be fairly easy to make a reasonably difficult process out of determining the correct rudder size. We could take the burden of calculations on ourselves, grinding polyhedral, aspect ratio, wing planform, rudder placement, fuselage characteristics, blanketing, etc. through a Rudder Volume Coefficient as our full-scale brethren do and come out - hopefully - with something close to The Truth.

And if modifying rudder size were anywhere near the problem for us that it is for them we might be justified in this approach; but fortunately variations in the size of a HLG rudder can be made in seconds - and the results of the modifications can be observed almost as quickly. Consequently the best formula for rudder size reads something like: sheet blasa + razor blade + an hour test flying in the park = the proper area. Begin your experiment by gluing a small temporary rudder (5% of wing area is a good point of departure) to the fuselage. Now grab a knife or razor blade and go out to test fly. Keep cutting away at the rudder between test glides until the slight wing rocking and tail swinging known as Dutch Roll sets in. When it does, go back one step, just enough to firm up the glide, and you probably have

a rudder as close to the ideal size as you can get (although as you become increasingly familiar with the design the need for some slight additional change may become apparent).

By this process you have solved the complicated Rudder Volume Coefficient problem far better than you could have with the most up-to-date data processing equipment - even if you knew what to feed into the monstrous mathematical machine. In this instance the glider itself becomes the data processing machine, one in which all the flight factors, down to the last shimmering nuance, are present in precisely the correct amounts. But even more important than this is the fact that you can watch the clickity-clickity-clack of this machine with understanding and profit. If you are observant you will quickly see how the addition and subtraction of very small amounts of rudder (particularly around the critical area) have far-reaching effects on the flight of the glider. And if you are the least bit methodical you will soon absorb a sort of Rudderеffectphilosophy which will come in handy on many occasions.

Rudder Twist-Ratio

Close on the heels of size comes the next consideration in the design of the rudder: to put it above the fuselage, below, or to combine the two. And here we run smack dab into another of those characteristics which make the rudder the versatile - and frequently perplexing - surface it is. This is its ability, if so placed, to induce a pivoting movement around the vertical axis (the basis of any turn) and at the same time to cause a rolling movement about the longitudinal axis.

I doubt whether many model builders have a very good idea of how versatile a thing the rudder is and the variety of ways in which it can be used. I imagine that they put a rudder on top or on bottom simply because it suits their fancy, or because it makes assembly easier. Yet few surfaces can work better for the model builder than the rudder in achieving the sort of launch trajectory and characteristics he wants. By positioning the rudder in just the right place we can build certain adjustments into the design, thus doing away later with some of the problems of trimming.

What makes the rudder so helpful is the fact that it is subject to the "aileron effect." Ailerons, of course, are used for rolling and they achieve this because they are placed well away from the longitudinal axis. By the same token the rudder can be used to create a certain amount of aileron effect, provided it is placed in the proper relationship to the longitudinal axis.

So what we must keep in mind when using top or bottom rudder <u>to turn a model</u> is the degree to which the rudder tends to twist or roll the model <u>into</u> or <u>out of</u> the turn, to combine yaw and roll or to oppose them. Top rudder opposes these two effects, tending to roll the model out of its turn, whereas bottom rudder combines the two and tends to roll the model into its turn.

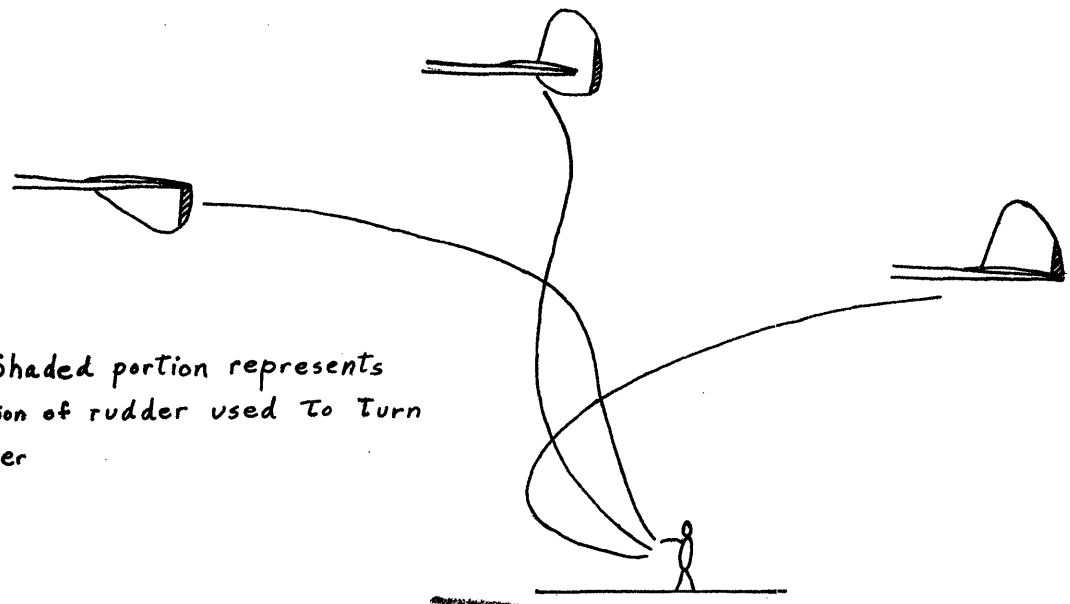
Now each rudder position, from the highest to the lowest, has its own particular characteristics and uses. To get an idea of the possibilities, let's take a look at what happens with a top, a bottom, and a centered rudder. The <u>top rudder</u>, because it opposes yaw and roll, gives the least "twist" of any of the possibilities. Most of us are familiar with the so-called "grass cutter." When launched side arm it usually does most of a half circle quite near the ground - cutting grass - before zooming up into the climb. This is shamefully wasteful, horribly inept, frightfully dangerous and simply not worth while. But it is not quite the whole story either, as we shall shortly see.

The other extreme is the <u>sub-rudder</u> in which case, with yaw and roll combined, we have the highest twist-ratio. With the usual launch this combination will result in the glider twisting right up off the deck - to the vertical - and probably rolling again in such a manner as to come out ahead of the launcher. Thus the sub-rudder is a sure cure for an intractably low angle of launch. It can also be used to advantage on practice gliders destined for use in a slight breeze due to the fact that it tends to get the glider somewhat upwind during the launch, thus saving downwind steps. But as far as efficiency goes it is not the thing. Just as a glider should not turn any more during its launch, neither should it twist. Each one is potentially wasteful and should be avoided whenever possible.

This would seem to leave the middle ground - once again - as the most fruitful. A <u>centered</u>, or Curly type rudder (with perhaps 3/5 above and 2/5 below the longitudinal axis) and with the overhang used for adjustment purposes, seems to be the most desirable compromise. This set-up tends to roll the glider in such a manner that the majority of its powered flight is as near vertical as possible - which is, of course, the object.

This aspect of rudder design then finally comes down to fitting whatever degree of twist-ratio that your particular launch demands. A very simple guide here is: the lower the angle of launch the lower the rudder position. If you launch at a low angle and are stuck with it then a sub-rudder may be the thing. If your launch is in the middle range then the centered rudder is probably the best. If you are one of the lucky ones who is already a step ahead of the game by having a high angle of launch, you can add to this the economy of a top rudder because of the small amount of roll needed when a glider is launched near the vertical.

And finally it might be added that the first place to begin tailoring someone else's design to your needs is by modifying the rudder. The other fellow's hot design may be hot for him with his launch and disaster for you with yours. Once you've determined what rudder placement best suits you - and experimentation here is easy - then you can put your rudder on the other fellow's design, and usually with some profit.



INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." NOVEMBER 1962

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

The month of October brought three new members for NIMAS:

ERIC GREENWELL, 420 Memorial Drive, Cambridge 39, Mass.
LARRY RENGER, 420 Memorial Drive, Cambridge 39, Mass.
TERRY THORKILDSEN, 4082 South 5th St., Murray 7, Utah

Eric and Larry are students at M.I.T.; Larry is a senior and Eric is a junior (academically); both are members of the Tech Model Aircrafters, the model club at the school. Terry is our first member from Utah and flies with a pretty active group of indoor flyers.

Rudy Kluiber

In the past we had benefitted from the very helpful and thoughtful attitude of Rudy Kluiber, and it was a real pleasure to meet him in person at the Nationals this year.

Therefore it was quite disturbing to hear of Rudy's recent death. In spite of our brief acquaintance, we feel a deep loss at his passing. It is notable that two different persons are assuming his AMA duties for the remainder of this year - for Rudy was one of the few in the country to hold two AMA elective offices at one time.

All of us - Rudy's family, AMA, NIMAS, and modelers everywhere have suffered a great loss. Those who knew Rudy will agree that this is the greatest possible understatement that could be made.

AMA ELECTIONS!

Action taken at the 1962 Executive Council meeting brought forth a reform in the voting schedule which will permit the newly-elected officers to make appointments for 1963 before the start of the year.

While this change should permit AMA business to get under way more smoothly, it places a hardship on voting members who will have 15 days at the most to get their votes returned by the deadline.

Our reference for this statement is found on page 6 of the October 1962 Model Aviation which reads (in part):

"Ballots shall be published and distributed as soon after September 1 as printing and mailing time will permit. (About November 1 is the objective, depending upon printing schedules.)"

The other end of the schedule is set forth thus:

"The cut-off time for accepting votes shall be set and printed on the ballots as of November 15 (postmark)."

It is unfortunate that the deadline is so close, for normal mail deliveries from AMA vary widely in arrival time. From personal experience we can state that our copy of Model Aviation (presumably the ballot will be mailed with MA to save postage) has been as late as 10 days behind delivery to other members of AMA in the area.

Such late delivery certainly is unfortunate, and not usual, but it happens. And anyone who has recently moved stands the chance of being disenfranchised by this short deadline. The main point is that you should have already read that section mentioned above, and have made your choices. Now, get that ballot in!

****FINANCIAL REPORT****

This issue of INDOOR NEWS AND VIEWS is the twelfth regular issue under the subscription system. Income from subscriptions and memberships amounts to just over $347, and expenses for eleven issues break down thus:

Printing costs	$276.77
Postage (newsletter only)	70.05
	$346.82

An additional expense which was greatly lessened by personal time donated by Hardy Brodersen was the $50 for the decals.

During the past year, incoming mail has totalled over 500 letters, and your editor has originated over 600 letters in answer to incoming mail and in quest of information for the newsletter. By the time you receive this issue, his total expenses excluding office supplies and postage for letters will have climbed to about $430, or about $90 over income. This is a very favorable indication of the progress of the newsletter, which was priced on the basis of about 150 members and subscribers.

Of course, the object never has been to make money, but as soon as membership reaches a high enough figure, the added money can be used to expand the technical coverage. The expansion will depend upon something else, also. The material must be made available by those who have it. At the present time, about 80% of the paper depends almost entirely upon those readers and flyers who are willing to share their ideas, plans and comments.

The outstanding part of the story has been the help given gratis by many people. They have reported the news, written articles and comments, drawn plans, rounded up more subscribers and offered suggestions and criticism. Without this help (a list of names would just about cover the NIMAS membership list and a few besides) the paper has no life. Out here in the sticks (indoor is rather new in Texas except before WWII) we don't get news except by mail. It's just too far to cover much of the activity in person! Thanks to all, and keep up the good work!

****FAI INDOOR REPORT****

Some time ago we pointed out that, in terms of plans and preparation, the 1964 World Indoor Championships are not very far off. Total planning needs to include sites, team selection details, and model design. Right now some groups are beginning to hash over model design, and each flyer will undoubtedly contribute his own experience and ideas to the total technological effort. Site planning for each area will consist of finding and securing the best possible site and using it to the utmost.

Quite a bit of criticism is always levelled at team selection methods each year in all phases of our FAI program - some of it well-deserved and some not. Perhaps our team set-back this year will foster even more such comments, but we hope that more than just criticism will come out of any dissatisfaction that anyone feels.

It is doubtful that any selection method will find acceptance by everyone, and most methods will have some disadvantages for one group or another. In the form it is offered, the following suggestion would practically eliminate qualification for the team in an area where there were no blimp hangars, but this is easily overcome. The important thing is that it is a suggestion that has good features, and can serve as a starting point for more discussion and planning.

The suggestion is as follows: set up a period of time during which each contender flies for an official time as often as he can, with a record kept of all his official times. After the cut-off date the team would be selected by choosing the flyers with the highest total of three attempts. The following advantages are offered for this system:

1. It makes for unlimited and boundless interest because a man doesn't meet sudden death. (Bad luck at one meet)

2. A hard luck first-or-second-trial flyer could come through with flying colors at a third or fourth trial.

3. It would not eliminate any flier because of conflict of interest or sudden trouble by missing an elim date.

4. It would enable more flyers to compete due to reasons mentioned above.

Also mentioned was an effect of this method - that choosing the team this way could result in more than one team member from the same geographical district - perhaps an all-western team. It is argued that this would give a stronger team - but we wonder. The final argument is that three top times is a better system than a single lucky flight, which is probably true - as long as the proper use is made of the top three times.

The major disadvantages of the above suggestion can be overcome by one modification. Change the scoring to award points to the flyers for each called official attempt in proportion to the top time for that site, then average the scores. This produces the most consistent fliers as team candidates, and the resulting competition will improve the state of the art to a high level.

It is hoped that everyone will consider this issue and the merits of the suggestions so far. Make your feelings known, along with suggestions on what to do to correct any shortcomings you may see. In this way we can arrive at the best plan - and let's do it soon!

RECORDS? MAYBE!

Last month's comment about all the top flights at the World Championships drew fire. Two different readers wrote to point out that: 1. Conditions for a U.S. record were not met, and 2. A precedent was set some time ago over a Wakefield flight by Hatschek. That's what we get for making uninformed assumptions!

John Malkin feels that his flight also will not be considered a N. Z. record, since stay-at-home flyers have no site that would permit a crack at that time.

QUESTIONS AND ANSWERS

One new question to add to the list appears below, but space does not permit a discussion of answers this month.

21. What is the normal range of thickness of microfilm, color by color, and what phenomenon causes the films thinner than purple (the end of the visible spectrum) to show gold and brown colors?

HINTS AND KINKS

All-Balsa Props

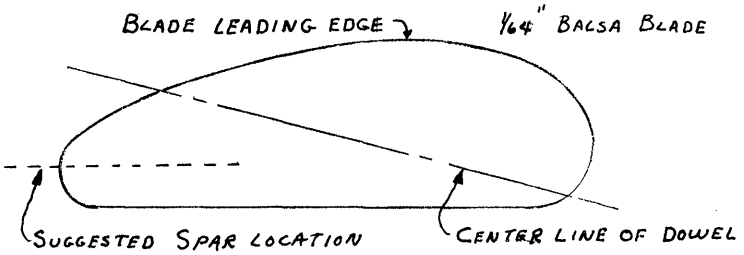
With the current boom in Easy B model flying, it is of interest to relate a discussion between Bill Bigge and your editor after the Parlor Mite article appeared (M.A.N. Feb. '62). At first reading, the prop construction method discussed in the article seemed to be merely forming a wet blade and air drying it. Bill commented thus: "Whenever balsa is wetted to make a bend, it should preferably be baked. For a prop blade, cut .020 soft aluminum sheet to the blade outline or a bit larger. Form in the camber and twist with the fingers. This results in a form that sheet balsa will readily conform to. Bind the wet blade blank on the form with thread, paper, or cloth. Bake it, trim to final size and assemble on the hub."

After some discussion between us, we decided that the repeated bending of a damp blade as discussed in the Parlor Mite article resulted in permanent pitch and camber by a slightly different mechanism - the wood is deformed (stretched on top and compressed on the bottom) until the relaxed state of the wood is the desired camber. That this results in a permanent shape seems to have been proven by a couple of experiments. Although high humidity will sometimes cause a baked prop to lose camber, this has not been observed with the formed (or deformed) props.

The second evidence to support this theory comes as the formed blade is sanded to reduce weight or increase flare, the blade relaxes and can be reformed again. We have on hand props that are nearly two years old that have shown no sign of losing their camber.

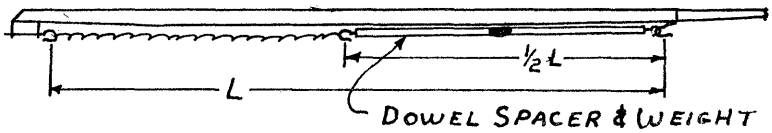
A handy way to add helix or twist and camber simultaneously to all-balsa prop blades and still produce a true-pitch prop is as follows: Make the hub assembly as usual, and cut out the blades and sand them to the proper thickness. Moisten the blades one at a time and wrap them around a 1/2" or 3/4" dowel with the axis of the blade inclined to the axis of the dowel as shown below.

Rather than wrap the blades and holding until dry, wrap the blade around the dowel until the camber is much greater than desired, then release the tension. Several such stresses as the blades dry out will produce the permanent camber mentioned above. Check the blades periodically against a Bilgri-type prop block to see that true pitch is being formed in, and finally, assemble the finished blades to the hub on the block.



More-For-Your-Money Test Flying

From Carl Redlin comes this hint for test flying new models or refining the performance of older ones: "To test my FAI models and props the past two years, I have been using a spacer (see sketch below) in combination with half-length motors to reduce flight turns and flight time by roughly one-half (more test flights per day's flying). With the spacer I'm able to see the models perform under full torque without the danger of landing in beams and without long waits between test flights. Works nicely, although the spacer and motor combination must be balanced very carefully. In testing with this system I have found that average prop RPM's for all practical purposes are the same as with full length motors. It's especially good for testing high ceiling props under low ceiling flying conditions."



NEWS FROM AROUND THE WORLD

CALIFORNIA - Santa Ana

Twenty-six flyers attended the first session at the Santa Ana hangar, with conventional models sharing air space with the flying scale enthusiasts.

Top times ranged up to around 30 minutes, with all-out efforts discouraged by heavy drafts near the top. When the installation of new ventilators is completed, the drift problem should be somewhat abated.

The first contest scheduled by the Sky Hoppers will be on December 2. Contact Bruce Paton for details of the contest at: 1010 N. Mirasol St., Santa Ana, California.

CALIFORNIA - Visalia

The Visalia Sky Kings have a very active indoor group that flies indoor scale, paper stick, and mike stick at their contests. The contact man for this group, Don C. Farnsworth, can be reached at 1607 W. Houston, Visalia.

INDIANA

Chuck Borneman reports that the Knights of The Round Circle will hold their first indoor contest this season on November 18. The site is on Bunker Hill AFB; events are HLG and Easy B.

MASSACHUSETTS

The Tech Model Aircrafters have scheduled a series of indoor sessions at the M. I. T. Armory, located at the corner of Massachusetts Ave. and Vassar St. in Cambridge.

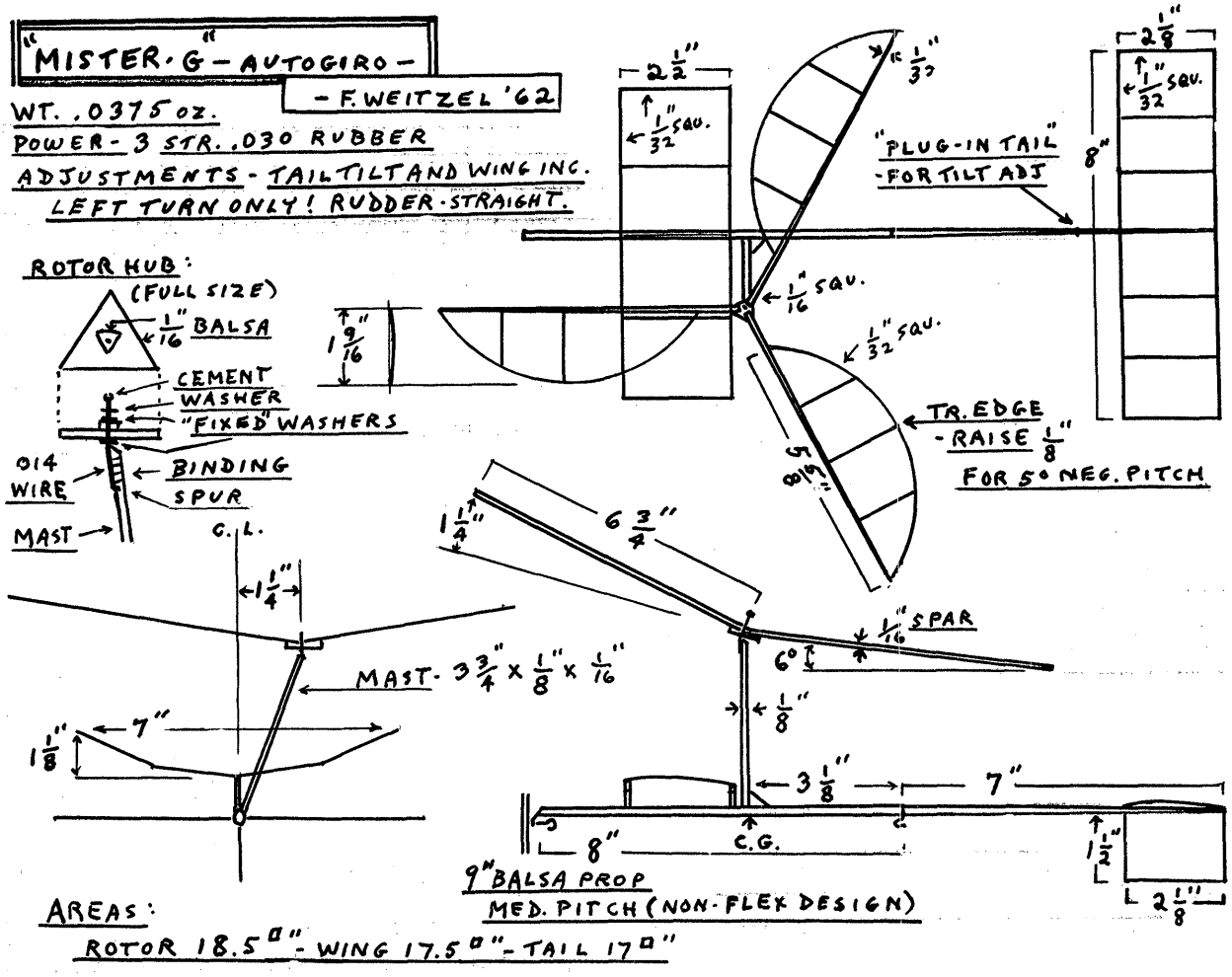
The next session is Nov. 17, 4:30 PM to 8:30 PM, and probably will be sanctioned as record trials. At present the sessions are open to the public. The Armory is 42', low Cat. II, but a good site.

NEW ZEALAND

The new site at Palmerston North turned out to be a top-notch site, 40' high and floor 80' x 150'. The Palmerston group started with Easy B types, and were awe-struck by John Malkin's new FAI as it did 12:30. The club there is so enthusiastic that John feels that New Zealand records will soon be broken right and left.

UTAH

Terry Thorkildsen reports the availability of a 32' school gym and a 30' church gym. The group is active and their paper stick times are up in the 8 min.+ range. On December 28 they plan a contest, but hope to have a record trials a bit sooner. Contact Terry for more info, his address is 4082 South 5th St., Murray 7, Utah.



STATE OF THE ART

When any Category III indoor stick record reaches the 30 minute plus region, any new record set in that class usually represents only a minor increase in the time. The model for this month, however, went whole hog and upped the "B" Stick record by over 10%. Designed and flown by Tom Finch and drawn for INDOOR NEWS by Bill Tyler, the model follows current design trends. Of the model Tom says: "As for the ship, it is strictly conventional. Weight is .0225 oz., 35% stab with C.G. at 50%; 12" stick, 9" boom and a 15/27 monospar prop with a 1.5" blade width (constant chord ala Bilgri). Motor used was a 16" loop of .042 weighing .0305 oz.; the motor could probably have taken 2450 turns. I used single bracing on the stick to the wing sockets. This permitted the stick to bow a lot more than I am used to and caused the tail chasing. The prop was quite stiff with the spar right on center and, except for the bowed stick, would have reached peak altitude in about 6 minutes".

****CHANGE OF PACE****

Somehow, in the quest ever-increasing efficiency for our conventional models, only a few fliers accept the challenge of the less conventional classes such as autogyro, helicopter, and ornithopter.

To provide a change of pace, then, we present this autogyro by Fred Weitzel. Fred has been quite thorough in his development of this model, and we have sometimes been hard put to keep up with design changes. Anyhow, the design has jelled to a very interesting machine.

"Mister G"

by Fred Weitzel

"Mister G" has turned out to be not only a good autogyro, but one that is especially suitable for small area flying. This is because of its naturally small flight circle, and the ability to bounce off walls and ride the ceiling like a small paper stick model.

The entertainment value of the model is increased by lively rotor action, which gives the flight good "eye appeal"; and the duration is aided by the prolonged climb. The prospects for Cat. I look good, as an average of 1:30 has been made several times under only a 12' ceiling.

The following comments may be helpful:

Left turn only is used, with the rudder straight. The turn is adjusted by tail tilt.

The correct size circle must be used - too wide a circle will give a stall; too small a circle will kill the climb.

It is better to keep it light. A heavier model will need more power, and therefore more torque control to prevent a spiral dive under full power. Add some rotor tilt (left side high) and increase the rudder size. An extreme case may require more rotor off-set. A lighter model with less power may be directionally erratic after the climb. If so, raise the prop pitch. Note: In building light, do not reduce wood sizes for rotor spars and mast. If these are flexible, adjustment becomes difficult. Try to hit .040 oz. or less.

Construction techniques follow the usual indoor methods - the motor stick is 1/64" sheet, covering is microfilm, etc. The wing should be fairly strong - especially the front spar.

Rotor incidence - low incidence gives slow rotation, high incidence gives fast rotation. "In between" is good for slow climb and fast cruise. On this model, +16° seems necessary - it looks high, but works well.

Rotor position - locate the rotor mast at that spot which gives level posture towards the end of the flight.

The plans specify a non flexing prop, but since the plan and article were finished, Fred made more tests and relayed the following comments on flexible props:

"Trying a flex-prop gave some quite different results! The duration was much better, but bounce and recovery very poor! It seem the model was stalling out on the ceiling due to getting into a too nose-high attitude.

This was corrected by moving the rotor back 1/2" behind the C.G. This way, the model flies well with a "flexer" but only in a small circle (6') and doesn't climb much. Opening up the circle a little (with tail tilt) gave a better climb, but lots of incomplete flights (drift, poor recovery from upset, etc.)".

THE HAND LAUNCH GLIDER

PART ELEVEN By RICHARD MILLER

DESIGN (cont.)

The Fuselage

Certain glider builders are surprised to learn that the HLG fuselage is anything more than a stick of slightly rounded wood which holds the wing and tail surfaces in some sort of alignment and handily protrudes beyond the l. e. of the wing in such a fashion that clay may be added to or subtracted from it, depending as we wish to cure a stall or a dive.

This limited view of the fuselage and its functions has no doubt come about in part due to the low position it is given on any list where the major glider components are graded aerodynamically. Practical matters, however, cannot be overlooked. In this respect Frank Lloyd Wright once remarked that anyone who purchased a house, no matter how daring the dwelling, had a right to expect that the roof be tight against rain. By the same token we should expect the glider fuselage - which takes a back seat to none when components are listed structurally - to stay together during the rough and tumble of flying no matter how exceptional the rest of the machine.

Actually then the HLG fuselage, far from being a stick, is a highly variable item. Each part of it has a specific function to which definite design considerations, some structural, some aerodynamic and some purely practical, apply. Consequently it should be designed and built to best fulfill these combined functions. To do this let's divide the fuselage into five arbitrary parts and examine each in turn.

The Boom

The boom, because it is the part of the fuselage most liable to break, deserves the most careful attention. In the early days of short tail gaps (and limited altitude) the broken fuselage was one thing. But with the movement to long moment arms - mentioned in Part 8 of this series - it became another. The incidence of breakage telescoped right along with the tail gap.

But if human affairs, as the historian Toynbee has forewarned us, is Challenge and Response, and if the Response is in proportion to the Challenge, then the stage was set for a new boom in HLG design. Who the pathfinders in this endeavor were I can't say. I picked up the trail amid the Skyscrapers, principally from Hatschek, and worked it out to my own considerable satisfaction. How satisfying this satisfaction has been is attested to by the fact that I have never (What, never? No, never!) broken such a fuselage since mastering the New Technique. This despite untimely plunges (somebody built a girder in the wrong place) into concrete from 100' and more.

The secret of this success, if anything so obvious can be considered a secret, is a lean, resilient fuselage of the hardest balsa (about 20 lb. stock as a rule) that can be found. When such a fuselage is properly constructed - and this is largely a matter of feel - it will have an even flexure between the wing t.e. and the stab l.e. Consequently it will tend to absorb impact loads evenly along its length, leaving no weak point to break. Its flexibility will cause it to give way to shock rather than trying to resist it. And while saving itself in this manner it will also provide a buffer between the hard knocks up front and the brittle q-grain tail surfaces.

The principal alternative to such a fuselage (and its historical antecedent) is one of lighter wood - as light as 7 or 8 lb. balsa - with a proportionately larger cross-section. Such a fuselage tends to be on the stiff side and this quality can be enhanced by several coats of dope which will give a tube-like effect to the boom.

Knowing all you do now about the virtues of the flexible (and twistable) boom of hard wood you may wonder why anybody would want to bother with anything else. This is a good question and all the answers to it are not ill-tempered and contemptuous. Such fuselages are still widely and successfully used. But when you start comparing....

In terms of simple strength there is no particular argument between the two types. We know that the strength of balsa varies directly with its density; and that therefore a boom of 10 lb. wood having twice the cross-section of a boom of 20 lb. wood will not only be its equal in weight but in strength as well. What this definition of "strength" leaves out is how much further the small, hard boom will bend before it snaps... and all that this ability to yield implies.

Whether this flexibility is an unqualified advantage or not is another question. Wally Simmers, for one, wonders. Although it would probably be going to far too call Wally a wholehearted advocate of the stiff fuselage he is quick to point out some possibile liabilities of the flexible boom. In examining photos of gliders being launched Wally (who always has one eye on component drag losses) has noticed a certain amount of blurrr around the tail surfaces, indicating some displacement. This, he feels, might be slowing things down a bit.

And he's right, it might.

And then on the other hand the surfaces might simply be moving into a less drag resistant position - thanks to the more flexible fuselage.

Of course this might not be the case either.

In any event this is not the whole case. Tail surfaces at the end of a flexible boom, if they whip, whip for only a short time (albeit a very critical one). There is the rest of the flight to be considered in terms of drag. If the fuselage spends its minute-plus coming down at around a 7° angle-of-attack, as there is every good reason to assume it does, it is doing a good deal more dragging than we might assume. This would argue for the slimmest possible fuselage.

We will finally have to leave it to the option of t individual as to where on the flexibility/stiffness spectrum he will alight. About most other factors of boom design and construction, however, there is generally less argument. A good boom usually tapers straight and uniformly, that is from the top as well as the side view, and has a cross-section as close to round or oval as possible. The cross-section is habitually deeper than it is wide, usually on about a 2:3 ratio or thereabouts. The reason for this (if you've ever wondered) is that vertically the fuselage must support the relatively large loads of the stabilizer while laterally it has only to support rudder loads.

The only fuselage that I have seen to date that violated this basic structural role was one of Pete Nishanian's which began in the normal fashion at the wing t. e. but flattened and widened at the l.e. of the stabilizer. The consequences of this were an extra-flexible boom which gave way slightly under launch loads, resulting in a little additional positive incidence in the stab. Consequently the glider went straight up when thrown that way. When, in the last fet feet of the launch, the boom asserted itself against the airflow forces the glider whipped into a quarter arc.

It is not surprising that, with the limited time available to us that day, we didn't get any really satisfactory results. We did, however, come close to some conclusions about what we had observed:

1. The minimum size of hard, well made booms is not so much limited by strength considerations as by flexibility. The boom in question was quite slender (the glider only weighed about .4 oz.) but stood up to unlimited throws.

2. The two-position boom may be just the thing for anyone chasing the bright bird of a straight-up launch. Perhaps the best approach is to begin with a fuselage on the heavy side and sand away between flights till the desired amount of "lay-down" is acquired.

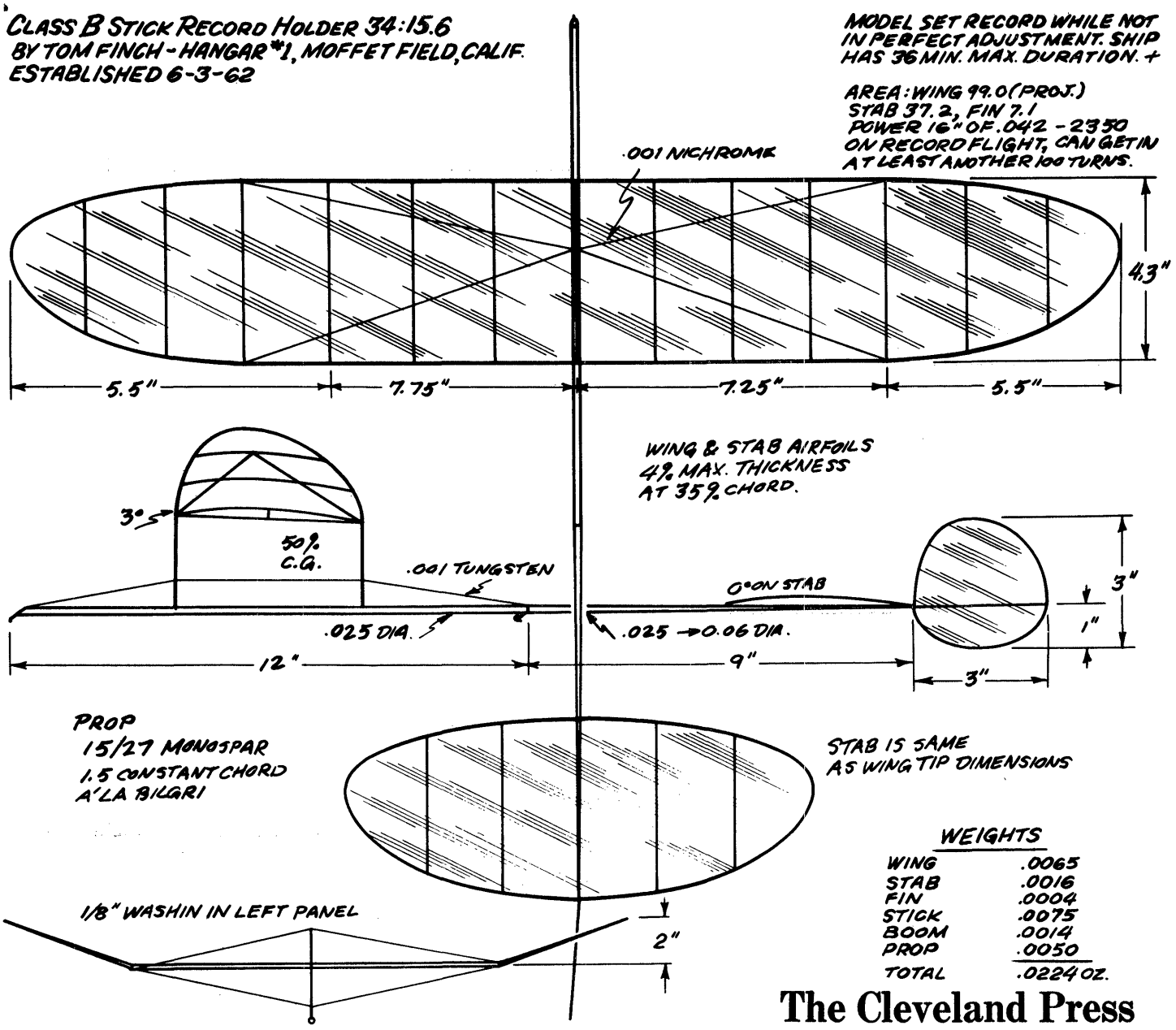
3. The force necessary to depress the stab to its low position has to come from somewhere; and no matter where it comes from the launch altitude will suffer in some degree. Nonetheless the gains of a straight up launch may offset this by a considerable degree.

4. It was fun. Next month: More about the fuselage.

CLASS B STICK RECORD HOLDER 34:15.6
BY TOM FINCH - HANGAR #1, MOFFET FIELD, CALIF.
ESTABLISHED 6-3-62

MODEL SET RECORD WHILE NOT IN PERFECT ADJUSTMENT. SHIP HAS 36 MIN. MAX. DURATION. +

AREA: WING 99.0 (PROJ.)
STAB 37.2, FIN 7.1
POWER 16" OF .042 - 2350
ON RECORD FLIGHT, CAN GET IN AT LEAST ANOTHER 100 TURNS.



WEIGHTS	
WING	.0065
STAB	.0016
FIN	.0004
STICK	.0075
BOOM	.0014
PROP	.0050
TOTAL	.0224 OZ.

The Cleveland Press

$\frac{2}{5.5} = \frac{10.3}{15}$

25.3

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." DECEMBER 1962

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NEW STAFF MEMBER****

In the September issue we hinted that INDOOR NEWS might soon have a new and permanent member of the staff. Jody Brock and I were married on November 8, 1962.

We are living in Richardson, Texas, and we invite any readers of INDOOR NEWS to contact us if you're in this part of the country. Our phone number is AD 5-4035, and the area code is 214 if you're calling from out of town.

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

Eleven U. S. members and two members from overseas swelled the NIMAS ranks to 117, with every indication of continued growth showing up. Even more heartening is the flood of membership renewals, some of them well ahead of the due date.

SID BERNSTEIN, c/o Research Facility,
Rockland State Hospital, Orangeburg, New York
DICK GANSLEN, 1303 N. Oakland, Fayetteville, Arkansas
PAT GREEN, 16880 Woodbine, Detroit 19, Michigan
FRANK KAROL, 6536 Mill Road, Brecksville 41, Ohio
ERNEST KOPECKY, 911 Garden Street, Union, New Jersey
TEDD KUBIT, 3714 Revere Ct., Cleveland 9, Ohio
Ens. A. A. LIDBERG, USS Klondike AR-22
c/o Fleet P. O., San Francisco, California
BILL LINDSAY, 216 Warrior Road, Drexel Hill, Pa.
LAWRENCE F. MZIK, 813 Bayridge Blvd., Willowick, Ohio
WALLY SIMMERS, c/o Midwest Model Aircraft Supply Co.
7541 South Halstead Street, Chicago 20, Illinois
CHARLES J. STILES, 401 N. Broad St., Philadelphia 20, Pa.
IRC Co. 6th Floor XLT

C. S. RUSHBROOKE, Model Aeronautical Press, Ltd.
38 Clarendon Rd., Watford, Herts., England
C. WOLTHOORN, Binnenrotte 110, Rotterdam-1, Holland

BACK ISSUES OF INDOOR NEWS

There are a few back issues available, mostly from recent months. These can be had on a first-come first-served basis for a handling charge of 25¢. It would be convenient if the remittance is made in stamps.

Numerous requests have been received for early copies of Richard Miller's HLG article. Since these are out of print, a new run would have to be made. If those who are interested in such back copies would drop a line, we can figure prices and let you know how much they will cost.

****FAI INDOOR REPORT****

Bilgri Resigns

Joe Bilgri recently announced that he is resigning as Chairman of the FAI Indoor Committee. He served in this position for two years, and the committee had the benefit of his years of experience to draw from. Thank you, Joe, for all the time and effort you put into the program - it is appreciated very much!

Kowalski Appointed

Dick Kowlaksi, who was the Central Zone Chairman for the past two years, has been appointed as Chairman of the FAI Indoor Committee. In addition to his work with the committee, Dick served as Team Manager in 1961 and was a team member in 1962.

New Central Zone Chairman

Paul Crowley, 16835 Lilac, Detroit 21, Michigan, has accepted the post vacated by Dick Kowalski. Paul is the man to contact for information pertaining to FAI Indoor arrangements in the Central Zone.

1963 Team Selection Program

Dick Kowalski has issued the following statement on team selection methods for 1963 which will result in the formation of a U. S. team in 1964. Please send your comments and suggestions to Dick at 20203 Moenart, Detroit 34, Michigan.

"It is quite possible that team selections for the 1964 World Indoor Championships will be made during 1963 in one of the following manners. Since there appears to be some criticism regarding the 1962 team selection method, we would appreciate any comments any interested flyer might like to make about our thoughts.

1. Use the same system as was used last year, in other words, Local Elims, Quarter Finals, and then a Zone Semi-Finals. The three top men would be qualified to fly at a Semi-Flyoff to be held at the Nationals. This system could only be possible if transportation to the Nationals could be arranged, and this is being reviewed right now. This method would obviously give the very best team since only the cream of the crop would be flying. The ultimate team selected would be chosen on a true national basis rather than the less national basis now used.

2. Use the same method as above except that perhaps two Semi-Flyoffs would be held - one on the West Coast and one on the East Coast. One team member from the West and two from the East would tend to satisfy the national aspect, but this would be considered as an alternative in the event that it was not possible to arrange transportation to a centralized Semi-Flyoff.

3. Use the same program as was used in 1962.

These proposals are mentioned only to communicate our thoughts and some possibilities and are not to be considered as multiple choice "pick one only"type of thinking. Every year we hear "Monday morning quarterbacking" but seldom, if ever, does anyone take the time to comment before the program planning is complete. Bear in mind that no program will ever satisfy everyone, but we do our best to field the best team and keep as many as possible happy. When proposals such as these are presented and we hear no comments, we automatically feel that everyone is happy with our plan and continue with no restraint.

The time to firm up our thinking is drawing near and it is hoped that by the January issue of INDOOR NEWS some concrete plan can be announced. If you have criticism or suggestions regarding the program outlined here, act immediately so that you may be heard."

From an editorial point of view, it seems that plan #1 would be the best possible choice, provided that the transportation can be arranged. Without transportation, plan #2 would impose more severe penalties upon fliers in the Central Zone than the 1962 plan did. At the same time, lack of a site even slightly comparable to the Finals site also restricts the Central Zone flyer. It behooves the Central fliers to somehow activate one of several sites not now in use so that a more realistic approach to trim may be made.

Since the entrants from the Central Zone comprised over half the total entries last year, we deserve some consideration. However, we must help ourselves find a place to fly - it should be centrally located and as high as possible. There are buildings over 100' here but can we get in???

Change FAI Models?

Boyd Felstead, our member from Australia, injects these comments for our consideration:

"What I feel now, as regards FAI specifications, that the wing span should be reduced to 2/3 the present limit. I am suggesting that the 35.4" projected span be reduced to approximately 24" for several reasons:

1. The smaller size ship would circle tighter with less chance of drift or hangups.

2. The smaller ship is easier to transport, which is important when travel to other countries is involved.

3. With 40 to 45 minute flights, it takes a long time to complete a contest - the Class B (approximately) size should reduce duration to about 30 to 35 minutes.

4. The smaller wing area would present a bigger challenge than we now have.

What do the other NIMAS members think?"

FOR SHAME!

Last month I warned of an announced deadline for AMA ballot return, commenting that a late arrival of the ballot could really throw things in a bind.

Almost as if that warning were a prediction, the ballots were late. I was all set to lambast AMA HQ for their usual (I thought) lack of planning, only to find that some of the very people who set up the early ballot procedure were responsible for the failure of HQ to send out the ballots on time.

In complete disregard for the established deadline, about half the area VP's failed to turn in the nominations for 1963 offices until quite late; only extreme effort on the part of HQ got the ballot out as early as it was.

If the following seems to be off the subject, bear with me: Early in November, AMA HQ was faced with the problem of finding out quickly how various Wakefield fliers felt about increasing flight time for Wakefield maxes from 180 seconds to 210 seconds. Knowing full well that many AMA members have to be forced to answer mail, Frank Ehling inserted a clause stating that failure to answer the questionaire was an automatic vote for 210 seconds.

Democratic? Hardly! However, the answers poured in, along with lots of invective aimed at Frank and his "ballot stuffing" methods. At this point I heartily congratulate Frank for having the guts to do it!

It is enlightening to hear just who answered promptly and screamed the loudest. One incumbent AMA VP who had ignored important AMA mail for some time answered by return mail. Another elected official whose regular AMA business had been neglected for months was loudly vocal, but he also answered promptly.

On the other side of the coin, many officials who take their jobs seriously avoided complaint, however strongly they felt the injustice. You see, they have been answering their mail and know how hard it is to get answers from some other officials.

There is a moral in this story for all AMA members: We have permitted our elections in some areas to become a popularity contest - electing officials who are not willing to assume the duties that go along with the prestige of the office. Make no mistake - some of these "popularity leaders" are highly capable, and would be just the men for the jobs, IF they would only work.

It is no exaggeration to say that the AMA is headed for trouble if all the elected officials do not perform the jobs that go along with their elective posts. And it is a sad commentary on those officials that their past performance made such drastic steps necessary.

We have two alternatives that will allow us to avoid the difficulties of non-working elective officials. We can, as a group, institute a performance review that would prevent such an official from being eligible for any office again, and indeed prevent him from holding office for a whole term if he had been elected for a term longer than one year. Or, we can all start paying around $100 apiece for our sporting licenses so there is enough money to hire the work done. Either way, we can "fire" those who won't work!

Supplies, Anyone?

As our hobby has grown, the little specialties that we need increase in number - and special wood is hard to find. The following addresses are of indoor suppliers who strive to fill our needs:

MicroDyne Precision Products (Lew Gitlow)
P. O. Box 65774
Los Angeles 65, California

Micro-X (Gerald Skrjanc)
1671 East 34th Street
Lorain, Ohio

Jem Products (Walter Erbach)
2979 Dudley
Lincoln, Nebraska

Great Lakes Indoor Air Meet

Every year people from hundreds of miles around the Cleveland area attend one of the most amazing indoor events ever held. The Great Lakes Indoor Air Meet, with no entry fee, features regular indoor events plus special events for youngsters in four ages groups below age 16.

For more information and for entry blanks, contact Chuck Tracy, CLEVELAND PRESS, Cleveland 14, Ohio. It will be possible to test-fly your models on December 30, 1962 in the Public Hall from Noon to 6 PM. Oh, yes - the contest will be held on January 6, 1963, from 10 AM to 6 PM in the Public Hall in Cleveland. The site has an 80' ceiling and the floor measures 120' x 140'.

RECORDS? MAYBE!

With the resumption of regular contests and record trials in all parts of the country, new records are now being set. The following flights were filed as possible records:

WILMINGTON RECORD TRIALS, November 9, 1962
CATEGORY I, Wilmington Rec. Hall, Los Angeles, 30' (30' ceiling)
Open C Cabin - 8:23, Bruce Paton

TECH MODEL AIRCRAFTERS RECORD TRIALS, November 17, 1962
CATEGORY II, M. I. T. Armory, Cambridge, Mass. (42' ceiling)
Senior A ROG - 8:46.8, Larry Renger
Senior C Stick - 16:40.1, Eric Greenwell

Late word from Ray Harlan, CD for the Tech Model Aircrafters, is that those two records have been homologated.

CATEGORY I RECORD TRIALS, Murray, Utah (32' ceiling)
Senior B Paper - 8:39.5, Terry Thorkildsen

NEWS FROM AROUND THE WORLD

CALIFORNIA - SANTA ANA

The first contest held in the Santa Ana hangar by the Sky Hoppers of Orange County was a huge success - they gave out $90 worth of trophies and still made a little! The air was cold enough to kill any hopes of records, but the events were hard-fought - an average of 12 entries per event. Partial results: Open Stick - 34:16, Tom Finch; Open Cabin - 20:44, Bill Atwood; Easy B - 15:57, Bill Atwood; Paper Stick - 15:01, Hal Cover; HL Glider - 1:18, Lee Hines

Trophies were awarded through third place, and third place in Paper Stick was picked up by Anne Gitlow, the wife of Lew Gitlow.

Bruce Paton has announced (for the record) that the Sky Hoppers don't have exclusive use of the hangar. Any group that purchases third party insurance (about $21) and obtains a license to use government property can get permission to use it. The Marine Commandant requested the Sky Hoppers to handle individual requests, so a $6 membership fee to the Sky Hoppers plus AMA license will cover all requirements.

ENGLAND

There was one more session in Cardington in October, but conditions were again fairly poor, and only Ray Monks topped 30 minutes.

Some headway has been made toward forming an Indoor Group in England, with a committee of four working on policy and sorting out rules and classes. The group will have representation on the S.M.A.E. Council, also.

HOLLAND

Our new NIMAS member in Holland, Mr. Wolthoorn, has been flying in a gymnasium with a friend every two weeks. He states that they are looking for a site with a higher ceiling, since they are beginning to outgrow the gym.

INDIANA - KOKOMO

Chuck Borneman reports that 21 contestants turned out for the first indoor contest at Bunker Hill AFB, and that Open Easy B had 11 entrants. These were most heartening results, and a big increase over last year. Top Easy B time by Chuck Meyers was 5:58.2, top HLG time by Bob Larsh was 38.6 for a new site record. Their next contest tentatively set for Dec. 16, contact Chuck at 1401 West Taylor, Kokomo, Indiana

ILLINOIS - CHICAGO

The winter indoor season has opened in Chicago, with the opening of Madison Street Armory, 2635 West Madison Street on every Saturday for <u>one year</u>. The flying will be scheduled as follows:

1st, 3rd, & 5th Saturday of month -	9 AM to Noon - HLG Noon to 4 PM - Rubber
2nd & 4th Saturday of month -	9 AM to 1 PM - Rubber 1 PM to 4 PM - HLG

KANSAS - WICHITA

The 27' Wichita University Girl's Gymnasium is the site for three flying sessions this winter. Regular classes are A ROG and HLG. Contact Stan Chilton, 446 Ida, Wichita Kansas for details,

MASSACHUSETTS - CAMBRIDGE

In an attempt to take one more crack at some Cat. II records before the end of the year, The Tech Model Air-Crafters obtained a sanction for their December 1 session. However, conditions were quite bad and few flights were even completed. Their next contest will be February 9. Contact Eric Greenwell, 420 Memorial Dr., Cambridge 39.

TEXAS - DALLAS

A November 17 record trials and contest produced good flights and 15 entries in three events, but good air in the 20' Walnut Hill site lasted only half an hour - not enough to "zero in" on any records.

The indoor flyers are rejoicing over the planned Cat. II record trials and contest in S. M. U. Coliseum on Dec. 22. This proved to be an excellent site the one previous time it was used. Drift was very low and the air was very buoyant, so the 50' ceiling may permit flights near 25 minutes after some practice. Contact Jim Clem (CD) 3505 Rosedale, Dallas, Texas or Bud Tenny, Box 545, Richardson, Texas for more info.

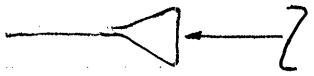
UTAH - MURRAY

Terry Thorkildsen reported on the site for their November record trials, and noted that it had a 32' smooth ceiling. Another contest in a 30' gym is to be held on December 28. Contact Terry at 4082 S. 5th St., Murray 7, Utah for more information.

QUESTIONS AND ANSWERS

In the September issue question #19 was posed, asking how to prevent rubber from creeping up on the hook. One suggestion, given us some time ago by Dick Ganslen of Fayetteville, Arkansas. Dick suggests that powdered resin be placed on the hook and inside the rubber loop. This prevents most rubber creeping quite effectively.

Another approach to rubber creep is used by several members of the Cliff Model Club of Dallas. They make a special hook like the sketch below, with an S-bend in the hook that tends to prevent the rubber creeping.



Last month question #21 pertaining to the thickness of various colors of microfilm was presented. At first glance this seemed to be a simple question, but it has opened a real Pandora's Box of side questions and considerations. A study of the physics of light and thin films reveals that it is difficult to measure these films in the first place, and that two different films could be showing the same color and be much different in thickness. We will report on this further as more information is available.

STATE OF THE ART

In our report of the Nats, we indicated that flying conditions were somewhat less than desirable. In spite of the extreme turbulence, Bob Champine set a new record with his winning flight in Indoor Cabin. Here is the three-view of his model, as drawn by George Batuik.

The fuselage truss was built up in this fashion: each cross-member was cut to length so that it approximated an equilateral triangle with the fuselage side and the preceding cross-member. Four cross-members were cut for each station, to assure symmetry of the finished fuselage. The truss reverses on opposite sides, so that top and bottom cross-members also will form a truss.

HINTS AND KINKS

Most of the innovations and developments that turn up in our hobby are simple modifications of existing ways of doing things, yet each makes a contribution in terms of reliability or convenience. So it is with all our suggestions this month. (Sketches on back page)

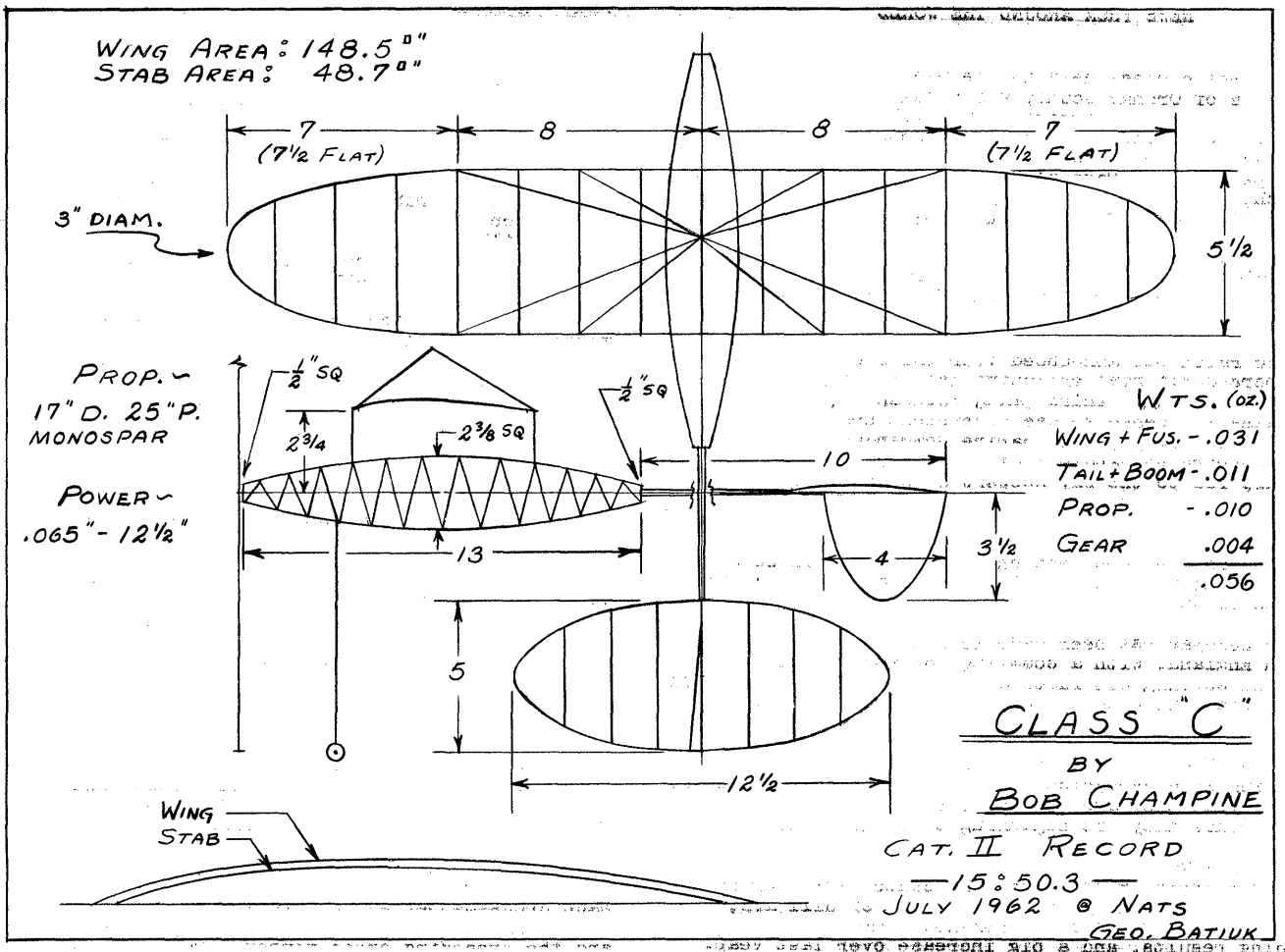
Modified Rudder

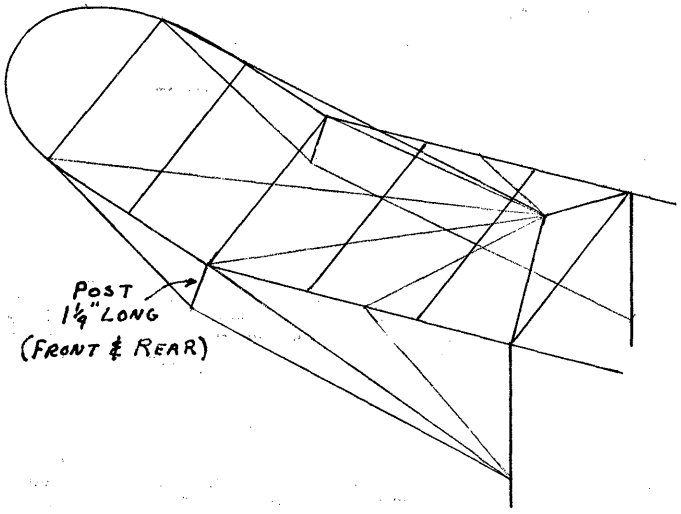
Last June, we observed an unusual rudder on Stan Smith's FAI model. Quite often, trailing rudders have a tendency to be weak at the point of attachment to the fuselage. Stan's rudder was shaped as shown, with a recessed place which provides two glue joints instead of the usual one. The result is a much more reliable and sturdy rudder mounting, at very little increase in weight.

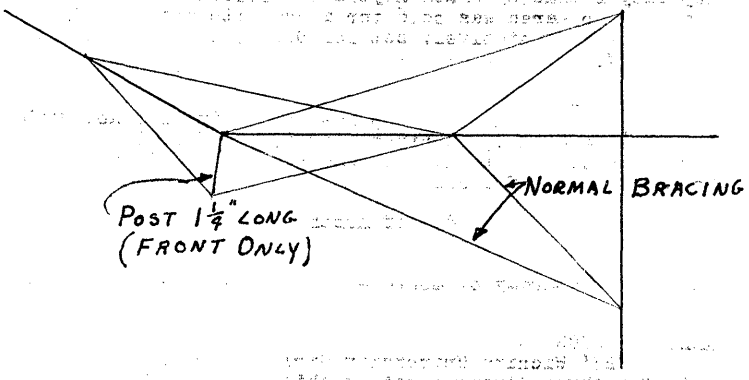
Wing Bracing

When we ran into Bill Atwood at the Nats, we were quickly into a bull session. One of the things that we discussed was the bracing on Bill's FAI model. It is reproduced here, but we almost missed the whole works. It seems that Bill was sketching on one of the work tables in the hangar - and they wouldn't let us bring it home! Bill has found one disadvantage with this type of bracing - it is a bit hard to always remember the long top wire when handling the model.

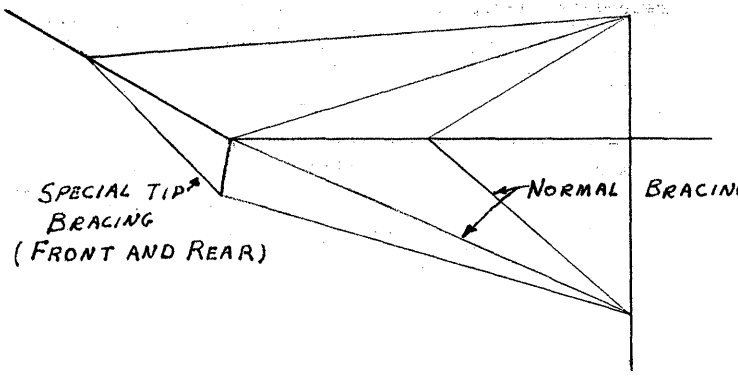
Bruce Paton tried Bill's bracing, then modified it as shown in the second sketch. Note that both the front and rear of both tips are braced on Bill Atwood's model, while Bruce used only leading edge bracing on the tip. He found that by leaving the trailing edge unbraced the flying was not materially affected, but the model would slide off obstructions more easily.



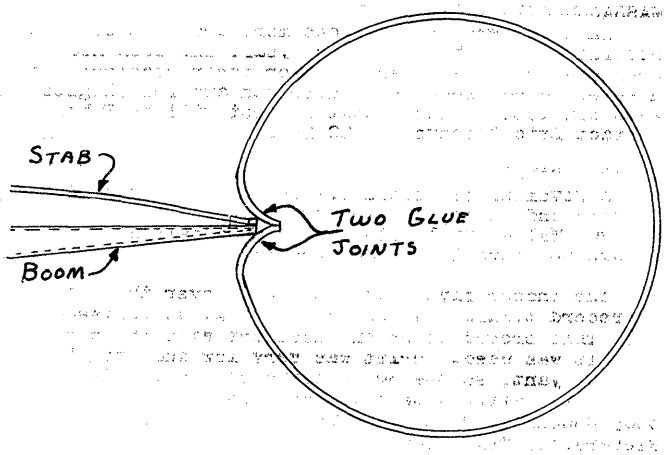




BRUCE PATON'S BRACING



BILL ATWOOD'S BRACING



STAN SMITH'S RUDDER

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." JANUARY 1963

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

NIMAS membership climbed to 122 as these five joined in the month of December. On the other side of the coin, the rate of renewal continues to be high.

REGGIE BATTERSON, 3503 Lawson Street, Richmond, Virginia
EMANUEL RADOFF, 61 Springbrook Rd., Livingston, N. J.
BUD ROMAK, 85 Sullivan Drive, Moraga, California
JIM SKINNER, Box 656, Donner Hall, Carnegie Institute of Technology, Pittsburgh 13, Pa.
HUBERT F. SCHUBERT, 428 Kansas Ave., Lorain, Ohio

Sites We Don't Have!

For a while, Richard Miller was cataloging (for our mutual misery) sites of former years that we no longer can use, and sites that have since been built that we aren't using now. We have expanded the list, and would appreciate further help in noting these sites. Here is a partial list:

Hangar #1, Hitchcock NAS, Texas. Near Galveston, this hangar was on the same pattern as those we use at Lakehurst. Unfortunately, Hurricane Carla caused quite a bit of damage to this building and it has been torn down - before we had a chance to use it!

Brittannia Assembly Hall, Bristol Aircraft Works, Filton, England. This is the largest hangar in the world and encloses 7½ acres of land with a 1054' long shed that is 420' high! The total volume enclosed is 33 million cubic feet of air!

City Auditorium, Albuquerque, New Mexico. Stan Chilton spotted this one, and said it looks like a 75' ceiling. The seating capacity is 6500, and might be a good place if it could be used.

The Sketchbook

For some time Lew Gitlow has been selling his Indoor Sketchbook for $1 - an outstanding buy. This little book has dozens of hints, suggestions, and other vital info on our hobby.

Lew is now working on a new Sketchbook, and can use some contributions to help fill the proposed 64 pages. He is interested in kinks, theory, ideas, testing gear, and not so much in plans. He will acknowledge your contribution in the book, and you will have the satisfaction of helping to make up one of the few books available that are up-to-date how-to-do-it on indoor model building. Congratulations are due for Lew's efforts in the behalf of our hobby - so few of us are willing to make this large an effort!

IT'S LATE??

Unlike Ken Sykora, editor of SCATTER, the excellent newsletter devoted entirely to FAI outdoor FF, we haven't resolved to "never come to this typewriter without a little glue on the fingers.....a little balsa dust in the hair", but we do try to meet a publication date of about the 7th of the month. Perhaps we should build more and fly a little more??

Last month the troubles multiplied like rabbits - a late start followed by a delay at the printer followed by Christmas rush mail....but we're still in business! This montn, we're early to try to save postage before the big increase.

FAI INDOOR REPORT

Team Selection Program

Our early cut-off date may miss a late letter, but as of this writing the following actions are under way pending final approval:

1. The team members are to be picked at a flyoff during the 1963 Nats. Probably the flyoff will be between the top three winners of the Semi-Final Elims held in each of the three zones. Transportation, with some reservations as to the starting point, will be available to take the Semi qualifiers to the Nats.

2. The CD's of the elims last year have been contacted to see if they will repeat this chore this year. For those in the Central Zone, please contact Paul Crowley, Central Zone Chairman, 16835 Lilac, Detroit 21, Michigan for the latest plans.

If Chairmen for the East and West Zones have been picked, word has not yet arrived as to their identity. Eastern and Western fliers, contact Dick Kowalski for info - 20203 Moenart, Detroit 34, Michigan.

3. Those planning elims should try to plan to hold those elims before the end of April. Please notify your zone chairman or Dick Kowalski if you intend to hold these elims, and get the dates nailed down as soon as possible.

World Championships Cat. II?

Germany has asked to hold the World Championships in 1964. If their offer is accepted, the site will be Cat. II - about 70' ceiling. This should give fliers without blimp hangars a better edge toward winning a slot on the team - and also sharpen the competition somewhat!

Two Central Semi Elims?

The possibility of holding a South Central Semi-Final elims in addition to the one usually held at Detroit is being explored. A large number of indoor fliers in the South have been contacted to determine just how many are interested. The response, plus other considerations, will determine whether the second elims can be held. If you are affected by this issue, please voice an opinion, pro or con. Address these comments to Bud Tenny, Box 545, Richardson, Texas.

FAI ÷ 2?

Last month Boyd Felstead's suggestion for small FAI models, about half the span of the present models, was presented. Comments received here were all in favor of this proposal, and Boyd received several comments, all against the idea. At any rate we are pleased to find a topic that people will comment on!

"MODEL AIRPLANE NEWS"

In years past, our hobby has had quite a bit of support from MODEL AIRPLANE NEWS magazine, including NIMAS membership for Walt Schroder, Editor. The February 1963 issue, (due about the time you receive INAV) will carry several indoor features. The cover is a color shot of indoor subjects, a construction article of an FAI job by Dick Kowalski leads off the contents, and Joe Bilgri's report on the World Championships tops the reading. The models which topped 40 minutes are featured in three-view presentation, with full-size plans of Rieke's model and in Kowalski's article. This looks like a good one, and we are grateful for the support of our hobby.

AN OPEN LETTER TO BILL EFFINGER

Bill Effinger, a long-time industry leader, authored "Tech Talk" in the Jan./Feb. AMERICAN MODELER, which is billed as a tour of events at the Nationals.

Dear Bill;

For years I have known you by reputation - the reputation of being one of the outstanding leaders of the industry, and an old-time model builder besides.

However, as editor of INDOOR NEWS AND VIEWS and as a member of the National Indoor Model Airplane Society, I must protest your recent comments about indoor models in the "Tech Talk" article in AMERICAN MODELER.

In your preliminary remarks you charge that all the current National Records are high as a result of rules changes which abolished old records - yet the only major

change in the indoor rules has been the addition of Category I & II flying. The present Cat. I "D" Stick record of 15:24 was set in a 28' ceiling with a model that would have been legal years ago!

You say that indoor needs to be pepped up, but the four events at the Nats have increased in popularity until a blimp hangar is crowded all during a 12-hour competition day. At Dallas and Chicago, where we have no blimp hangars, we really need two days for the event so every one can get a chance to fly. Where are all these people coming from if (as you say) indoor has little to offer to the newcomer?

You say that we need new events - and suggest ones like indoor CL speed and stunt, battery powered FF, and ultrasonic controlled RC type models. All over the country, many dedicated indoor fliers spend much of their time and effort attempting to secure the use of sites - and to keep them once they are in them. Just one time with any of the events you propose would be sufficient to permanently close the sites we have labored to get.

You see, when the managers of potential sites are contacted, the initial reaction is one of horror. "Model AIRPLANES! They will break the place up!" Only after they are shown a microfilm model, or see an Easy B fly in their office are they convinced that it is safe. Can you imagine their reaction to .025 powered stunt or speed jobs? If you think I've overstated the case, please try to set up a site for indoor flying. Please do - we need more sites!

You propose events that can be flown indoors as "rainy day event insurance" - but, after all, our models cannot be flown out-of-doors even if it isn't raining! You are willing to risk our hard-won sites for the sake of "pepping up" indoor flying. In short, the events you propose could eliminate our type of flying entirely.

Further, in spite of the fact that the Navy is saying that the Nationals has grown too large for their station facilities, you propose even more events! You propose to hold these events in Navy hangars, even though this is against Navy regulations!

There is one final point you have failed to consider: For all the new and "peppy" events you suggest, it costs more to fly the models one time than it costs to build and fly an indoor model! Indoor modeling is about the only form of competitive flying which is within the reach of all people regardless of financial circumstances. It is the only form of model flying where the performance cannot be substantially improved by spending huge sums for equipment.

Sincerely yours,
Bud Tenny

Dear Mr. Effinger:

I am afraid I will have to challenge your comment, "Indoor flying does not offer much to the newcomer..."

Since I had never heard of indoor model airplanes until last July, and am just beginning to realize how ignorant I am on the subject, I believe I qualify as a newcomer.

I was hooked after building my very first model, a paper-covered Easy B. For anyone who enjoys creating things with his hands, isn't satisfied until they are just right, and has a competitive spirit, indoor modeling is a fascinating hobby. And what a thrill it was when that very first plane actually flew! This first model, incidentally, has competed with great success against models built and flown by several experienced indoor flyers.

I find pouring microfilm to be great fun, and the microfilm models even easier to cover than the paper ships, although they're much less durable when subjected to the inexperienced handling of the newcomer. Those bracing wires always get in the way of my hand!

I have started a new model and I'm impatiently trying to get time to build an ornithopter, a helicopter, a scale model, a Class A ROG, and then an ROW model. Not enough variety?

Bud and I will both be competing in the Nats next summer - see you then!

Sincerely,
Jody Tenny

STRUCTURAL ANALYSIS

The September issue contained a report on two models that were designed especially for the solid motor stick class which was finally defeated unofficially if not yet officially.

Bill Bigge was moved to mathematically examine the properties of solid motor sticks, and while he was at it, the properties of most of our other structural members also. It all boiled down to about seven pages of math - "not too much calculus involved." He offers these flat statements without the math, but will furnish the math if you gotta have it:

1. A motor stick is lighter for the same stiffness and clearance if the cross-section narrows toward the top than if it is rectangular or narrows toward the bottom, saving up to about 5%.

2. A motor stick is stiffer for the same weight and clearance if the edges are not rounded. Rounding the lower edges is about 2⅔ times as bad as rounding the upper edges. A section 2 mm x 4 mm with a ⅛ mm radius on the edges is 2.9% less efficient than a rectangular section of the same area with the height equal to twice the width.

After making the assumptions that the cross-section of a motor stick is homogeneous and non-concave, Bill recommends that:

1. The edges be rounded enough to avoid crushing.
2. The cross-section be made narrower at the top, if it is not too much trouble to do this accurately.

Bill goes on to say of other structural members:

"I recommend rectangular cross-sections in general for all members because they are easier to make accurately and are usually slightly more efficient. Prop spars should perhaps be round because it is then easier to attach the ribs nicely. However, round prop spars are structurally more efficient only if:

1. Strength and not stiffness is critical, and
2. The angle between the side of a square cross-section and the direction of load exceeds a certain value. If prop spars are properly placed and properly matched, strength may indeed be more important than stiffness."

Bill's comments should be especially interesting to Easy B fliers (solid motor stick) and to FAI fliers. We will need to make more efficient models, starting with the structures and moving out. Many people who have been examining the information available on the German models tend to discount some small differences in weight and other minor details, then pounce on some radical departure and say "That can't possibly make that much difference!" I am willing to say that any one detail of these models won't make a lot of difference, but if you add up the effect of six or seven 3% gains it amounts to a lot! In other words, anyone who wins at the World Championships in 1964 will (barring luck) have made sure his model is nearly perfect in every phase of design and construction. Further, he will have made sure (as did the Germans) that he is totally familiar with the model under all flight conditions.

NEWS FROM AROUND THE WORLD

CALIFORNIA - VISALIA

In THE INFORMER, newsletter of the Visalia Sky Kings, Don Farnsworth reports that basketball schedules have temporarily filled their sites. A search is under way, and any suggestions will be welcome. Contact Don at 2040 Cecil Circle, Visalia, California.

CALIFORNIA - WILMINGTON (LOS ANGELES)

Sanctions for all twelve monthly contests at Wilhall are being applied for, with Wally Miller leading off as CD for the first three months. Scale fliers note: On Feb. 8 the Indoor Flying Scale Annual will be held. The high point flier will win an 18" engraved trophy. Wally Miller's address: 22142 Welby Way, Canoga Park, Calif.

CANADA - WINNIPEG

D. H. McRae reports that some flying is done in a 22' auditorium in Winnipeg. On rare occasions, they get to fly in a RCAF hangar with 40'ceiling. Since they are hoping to increase activity there, Mr. McRae will welcome inquiries - Box 15, Group 33, RR 1, Winnipeg, Manitoba.

CANADA - VANCOUVER

Greg Stevenson, of the Vancouver Gas Model Club, has written asking for contributions on indoor subjects for their club newsletter, HOTHEAD. Several club members are now flying in a site with 35' ceiling, getting good results from Bilgri's Ditto and Floppy. NIMAS, arise!! Send contributions to: 3885 West 65th. Ave., Vancouver 13, B. C.

MISSOURI - ST. LOUIS

Carl Fries reports that the St. Louis Arena is strung like a birdcage with wires, but that they are hoping to set up some flying sessions in a church gym. Contact Carl at: 8798 Sturdy Dr., Crestwood 26, Missouri.

MARYLAND - BALTIMORE

The annual indoor meet in Baltimore will be held on Jan. 27, 1963 in the 5th Regiment Armory on Hoffman St. near North Howard St. Events: HLG, Indoor Stick, Prefab Kit, Flying Scale. Contest hours: Noon to 4:30 PM, test flying 9 AM to Noon. CD: Howard Weil, 4014 Chatham Rd. Baltimore 7, Md.

NEW YORK - ORANGEBURG

Sid Bernstein has rounded up quite a few fliers and a 29' auditorium in Orangeburg. The major activity is now in B paper and HLG, but other types are welcome. Even Richard Miller has flown with this group and holds the HLG site record at 28 sec. Contact Sid c/o Research Facility, Rockland State Hospital, Orangeburg, New York.

TEXAS - DALLAS

Excellent flying conditions helped Don Chancey and Jerry Murphy set new Cat. II records (see RECORDS? col.) at the second indoor contest this winter. The site, SMU Coliseum, has ideal construction for draft-free flying with the flight area 20' underground and the entire site surrounded by a corridor. It is hoped that this site will be available for more contests after basketball has finished up. Contact: Bud Tenny, Box 545, Richardson, Texas to be sure of receiving contest notices.

QUESTIONS AND ANSWERS

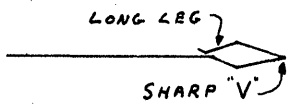
Several times in the past, we have received questions about rubber motors and their handling. We still hope to receive a promised article on the subject, but in the meantime, these questions can be summarized in these three questions:

22. What is the best way to break-in a motor?

23. Is there a difference between pre-winding and break-in? If so, when is each used?

24. What is the most effective way to use the technique of "backing off" turns?

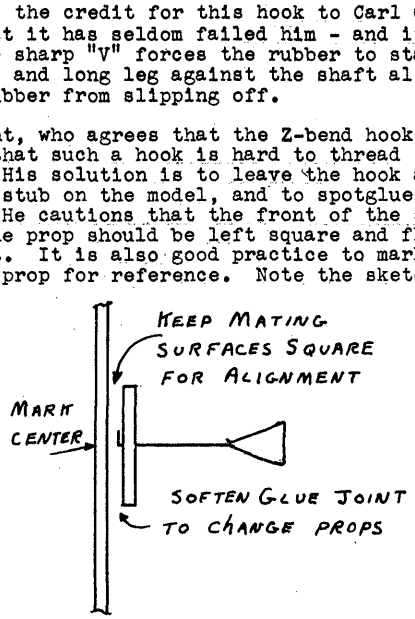
Last month, we sketched a prop hook with a Z-bend that prevents rubber from creeping up on the hook, in answer to Question 19 about rubber creep. Dick Kowalski suggests the hook sketched below:



ANTI-CREEP HOOK

Dick gives the credit for this hook to Carl Goldberg, and claims that it has seldom failed him - and it is easy to bend! The sharp "V" forces the rubber to stay put under tension, and long leg against the shaft also helps prevent the rubber from slipping off.

Bill Haught, who agrees that the Z-bend hook really works, notes that such a hook is hard to thread through the bearing. His solution is to leave the hook and a reinforcement stub on the model, and to spotglue the prop to the stub. He cautions that the front of the stub and the rear of the prop should be left square and flat for good alignment. It is also good practice to mark the center of the prop for reference. Note the sketch below:



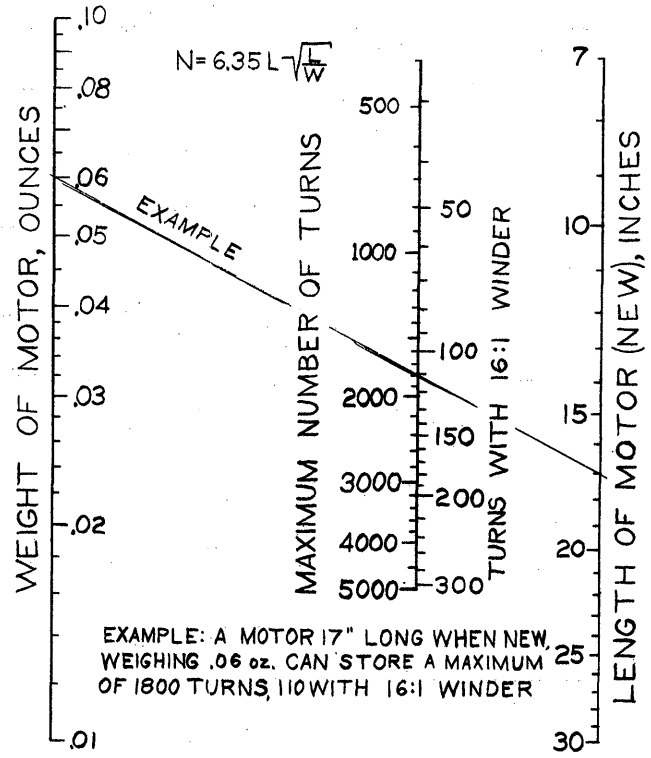
PIRELLI NOMOGRAM

The June 1961 M.A.N. published an article on Pirelli rubber by Bob Hatschek, and Bob gave this formula for number of turns:

$$N = 6.35L(L/W)^{\frac{1}{2}}$$

N = number of turns
L = length of the motor in inches
W = weight of rubber in inches

Charlie Sotich worked up the following nomogram based on Bob's formula. The constant, 6.35, is of course for Pirelli. Because of variations in the rubber, the air temperature, winding technique, and other variables, this nomogram is intended as only a guide. Under many sets of conditions most motors will take more turns, but this nomogram will give a good starting point.



RECORDS? MAYBE!

S. M. U. RECORD TRIALS, December 22, 1962
CATEGORY II, SMU Coliseum, Dallas, Texas - (56')
Jr. A ROG - 8:10.9, Don Chancey
Jr. B Paper - 12:01.0, Don Chancey
Open Ornithopter - 2:10.0, Jerry Murphy

HINTS AND KINKS

For some time, several groups around the country have been using hydrogen-filled balloons to retrieve indoor models from certain unfortunate perches. The hydrogen is "home made" with various types of chemical reactions in home made hydrogen generators.

Before describing a typical generator, we should examine certain dangers associated with the use of hydrogen: Unlike helium, which is chemically inert, hydrogen is violently explosive if ignited when mixed with air or oxygen. Since hydrogen-filled balloons are always likely to break or puncture, such a mixture can be formed as the gas escapes from the broken balloon. If this happens near an overhead heater, the explosion can result even if the heater is not running since they usually have a pilot light for automatic start-up.

Our typical generator, as used by Charlie Sotich and other Chicago Aeronuts, uses this chemical reaction:

$$6\ NaOH + 2\ Al \longrightarrow 3\ H_2 + 2\ Na_3AlO_3$$

Charlie describes the equipment and operation thus:

"My generators consist of quart "pop" bottles that are wrapped with masking tape. In case the bottle breaks

or cracks, the chemicals and glass fragments won't go flying around. The ingredients are lye and aluminum foil, both obtainable at most grocery stores at low cost.

I use a fairly large 10¢ balloon and I find that about .35 oz. of aluminum and 1.6 oz. of lye fill these balloons to a good size (.3 to .5 oz. of lift).

I have a plastic cup that I use to measure out the lye and I pour it into the bottle through a plastic funnel and add about 3/4 of a pint of water. The amount of water used controls the rate of reaction. Very little water gives a very concentrated lye solution and a very fast reaction. More water slows down the reaction. I prefer a slower reaction, because when it goes fast, steam is generated which later condenses inside the balloon, reducing its lifting capability. If steam is generated, it gets the balloon and bottle too hot to handle. It usually takes me about half an hour or more to fill a balloon this way.

Preparation of the foil can also control the rate of reaction also. I roll the aluminum foil into a fairly tight wad, so that not too much surface area will be exposed. The foil is dropped into the lye solution and the balloon is then put over the neck of the bottle.

To make the balloons easier to fill with hydrogen, I blow them up with air in advance to prestretch them and reduce the pressure needed to fill them."

Since the lye solution is a highly caustic agent, we need to remember that accidents can happen while handling it. The work area should have free drainage and there should be some way to flood the area with water in case of spillage. The pressure generated with this method is low, so the main danger from fast reactions is not an explosion, but rather spillage due to cracked and leaking generators if the bottle is overheated. Be CAREFUL!!

Adjustable Tail Incidence

During a recent visit to our house, Bob Champine showed us the adjustable tail and bracing system that he uses on his FAI ships.

Figure 1 (plans page) gives the over-all view of the tail bracing system Bob uses with the adjustable tail. Of the bracing, Bob says, "This worked very well and there was no tendency for twisting - probably because the tail is working at such a low lift coefficient and the pitching moment is low."

Figures 2 and 3 illustrate the adjusting mechanism. On an unbraced tail it would be very simple, just a post on the real of the tail boom and a tissue socket on the rear of the stab to slide up and down on the post. This permits incidence adjustment of the stab similar to the system normally used on the wing.

The adjustable tail gets a bit more complicated when the tail is braced, as shown in figures 2 and 3. The front bracing post fastens to both the boom and to the stab leading edge, while the rear post fastens only to the stab trailing edge. The fin also fastens to the stab, on the opposite side of the socket. Thus, when an adjustment is necessary, the entire bracing system and the fin goes along for the ride. Things may get a bit crowded around the back of the model, so Bob suggests that a small wire hook be used to move the socket up and down on the post for adjustment.

Bracing Hint

Larry Renger passes on this hint, which was dreamed up by Ray Harlan. Figure 4 is almost self-explanatory, but the idea is this: Instead of a notch in the post or a small peg glued on the post, Ray uses a longer sliver of wood with a pin hole punched in it. The wire is then threaded through the hole during bracing and glued after the alignment is complete.

STATE OF THE ART

This month our model set the Cat. I B Stick record of 10:38.6 in a flight at the home of Cat. I flying - Wilmington Rec. Hall in Los Angeles. The outstanding part of the story is that Easy Breeze is a Wilmington formula Easy B - solid motor stick, all-balsa prop, and no bracing of any kind. The builder, Larry Renger, left for school without realizing that he had set a record. In a letter to Dave Copple, CD, Larry said:

"Thanks for letting me know about the B record. Not the faintest thought had entered my mind about it except that an Easy B couldn't possibly stand a chance against a real mike B, or even a tissue one. I think it is a neat event for several reasons, and not the usual ones at all. For one thing, the lack of bracing and solid motor stick force one to learn about wood choice, giving gross evidence when an error is made. The sheet balsa prop requirement allows more convenient experimentation, and when necessary, prop tip clipping to match power to a ceiling in an emergency. In a discussion with one of the professors here, it developed that in some cases a flat bladed prop with a constant pitch angle (no warp at all) could be the best, but that no one really knows much about the subject. It is my personal opinion, however, that in the case of a tractor indoor model the whole aircraft is efficient enough that a "true-pitch" prop is best. Enclosed are the plans to my Easy B, the "Easy Breeze". The odd triangular tips were suggested by Ray Harlan to allow lighter wood at the tips while still maintaining strength. The all-up weight (less motor) is .023 oz. (not at all a fantastically light ship)."

THE HAND LAUNCH GLIDER

PART TWELVE by RICHARD MILLER

EXCUSES

In recent months Richard Miller has changed jobs, and the new one has had him gadding around the country interviewing people. Some of those who have occasion to write to Richard and to me have noted some difficulty in contacting him. Not too long ago Richard passed on the following gem - newsletter editors please note:

"Let me suggest the multiple post-card technique for recalcitrant contributors. Take - buy that is - a number of U. S. Government Post Cards, like 5, 6 or 7. Address them all to the person in question. Then, on the backs, write a series of progressive messages....

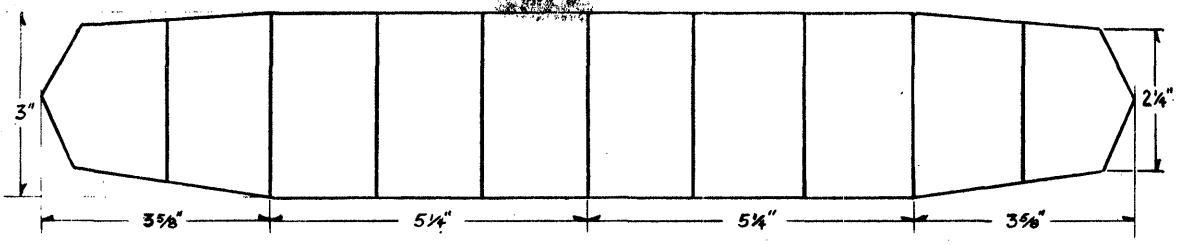
1. I have the distinct impression that during 1958 you promised me a drawing of the "SuperSplooch"...
2. The more I think of it the more certain I am about that "SuperSplootch" drawing.....
3. Yes, I remember distinctly. You said you'd have "SuperSplootch" to me during May ...1958 that was...
4. Now, when you do the "SuperSplootch" drawing....
5. You Bum, ...

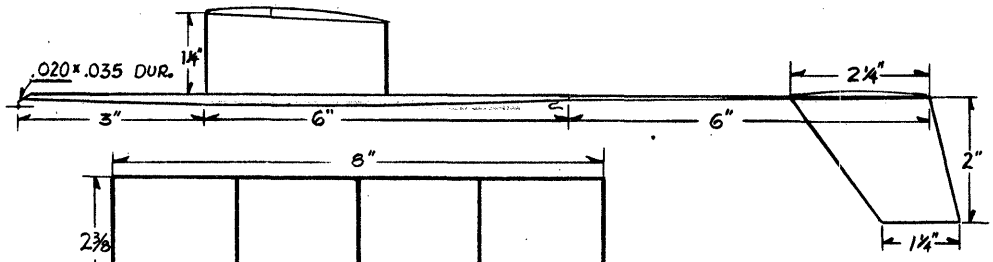
With the cards thus prepared to your satisfaction begin mailing them. Mail one on Saturday, another on Monday, a third on Tuesday - skip a day - then one on Thursday, one Friday, etc. Recalcitrant contributors can quickly be broken down in this manner."

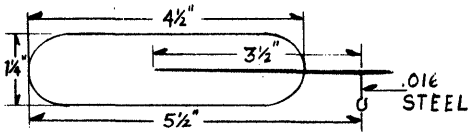
However, after Richard's article failed to arrive, I followed his instructions only to receive an interesting series of excuses such as:

"Dear Sir: Thanks kindly for your timely request for our illustrated list of excuses which, as promised, will always be sent on request. Your interest is timely and heartwarming....."

So, please bear with us and we'll catch him soon. He has promised to visit Texas in his travels and, if necessary, he shall be staked out at hard labor until the words come forth! Perhaps a girl-shaped glider or a glider-shaped girl could also be offered as inducement?? Actually, Richard is not malingering - this we know. There is nothing so conducive to unproductive activity as quite a bit of travel, unless it is a lot more travel.







EASY BREEZE

Designed by LARRY RENGER
AMA Record Holder - Sr. B Stick
10.38.6 - 29'11" Ceiling

WING : Spars - .030 x .650 → .03
Ribs - .018 x .020
Compression Ribs - .030 x .030
Posts - .060 Rnd.
Dihedral - 25° Each Tip

STAB: Spars - .018 x .036 → .020 * Ribs - .018 x .018

Rudder: .020 x .020

Prop: 25" True Pitch - (Warp on Block)
Blades - .012 → .009
Boom - .060 Rnd.

Motor Stick 3/16 x 1/8 oval → 3/32 Rnd.

Tail Boom .040 Rnd → .020 Rnd.

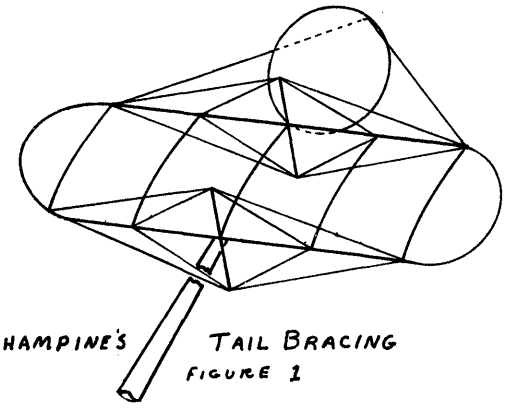
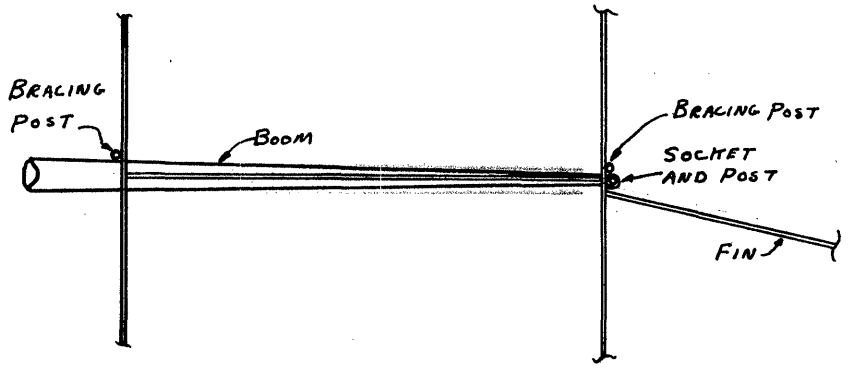
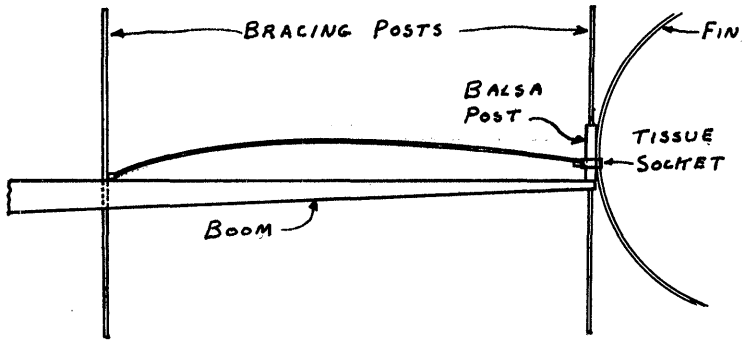


FIGURE 1

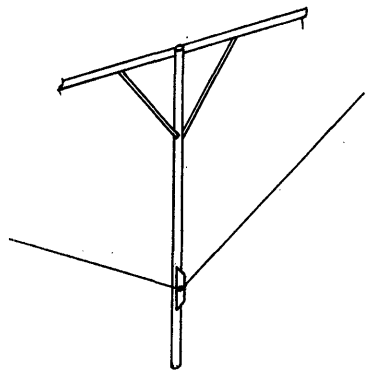
Polansky



TOP VIEW - ADJUSTMENT DETAIL
FIGURE 3



STAB ADJUSTMENT DETAIL
FIGURE 2



RAY HARLAN'S WING POST
FIGURE 4

Jan 63

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." FEBRUARY 1963

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

Eleven new members joined NIMAS during January, and now our ranks number 133 members. However, INDOOR NEWS also has 15 subscribers who haven't joined NIMAS but still help carry the message.

J. O. BAILEY, 14724½ Lemoli Ave., Gardena, California
NORMAN BURGDORF, 9822 Whitcomb Lane, St. Louis, Missouri
DAVE CALL, 5628 North 2nd. Street, Philadelphia 20, Pa.
BOB CROWLEY, 2211 Royal Oaks Dr., Irving, Texas
NORMAN C. GETZLAFF, 19606 Elsmere Ave., Cleveland, Ohio
LARRY LOUCKA, 3542 Sackett Ave., Cleveland 9, Ohio
LARRY MILLER, 13706 Tyler Ave., Cleveland 11, Ohio
JOSEPH POLOSO, 4710 Osman Place, Bronx 70, New York
STANLEY J. SCHUTE, 47 Walnut Street, Millis, Mass.
RALPH WILSON, 2534 Brooklyn Ave., SE, Grand Rapids 7, Mich.

JACK ERIKSEN, 44 Seaview Tce., Mt. Albert, New Zealand

C. S. Rushbrooke

Last week we received the unhappy news that C. S. Rushbrooke passed away early in the month. Even though we never met him, we respected "Rushy" for his dedication to the hobby we all share. He will be missed all over the world, for his influence spread far beyond the borders of England.

FF CB Back in Business

Phil Klintworth has been appointed as Chairman of the Free Flight Contest Board. He has already prepared a course of action, and the backlog of CB business should soon be cleared out.

AMA President John Worth hopes to be able to help Phil clear out the backlog by shortening the six-month study period to three months so that the proposals left over from 1960 and 1961 can be accepted or rejected in time for the 1964 Rule Book. This should help the HLG fliers, as their records picture has been beclouded for some time by impossible times set with "mike" IHLG.

****NIMAS BALLOT****

Some of the old-timers may well say, "Oh no! Not again!" However, over half the present NIMAS members have never seen the ballot and haven't had a chance to express an opinion of pending indoor rules proposals.

FF CB Chairman Phil Klintworth has expressed the hope that NIMAS will play a major role on indoor rules proposals. At the present, we can serve in two ways to help with these proposals. First, we can act as a clearing house for new rules proposals and help to clarify new proposals and get them into shape for the Contest Board to consider. Second, we can act as an advisory group to the Contest Board so they can better fill our needs. To this end, we use the ballot as an expression of your feelings. For the ballot to have real meaning, it should be returned by all NIMAS members who will fly under these rules.

As with all responsibility, we will have to carry our part of the load or official NIMAS action will be without meaning. The individual NIMAS member can fulfill his responsibility by filling out the ballot (included with this issue as mailed to members) and send it back as soon as he can. Now is the time for us to prove we can be depended upon - if the return is scanty, it will only prove that we don't really care. If that turns out to be the case, NIMAS will have lost its best chance to be of service to indoor flying.

To fill in newer members, the ballot covers these issues: Solid Motorstick B Paper, Indoor HLG, FAI Indoor, and an opinion poll on Class D Indoor Stick. The "solid stick" proposal was originally passed by the FF CB in the form of suggestion to the CB that this would be a fine idea and the wording was unsuitable for inclusion in the Rule Book. Further, it was passed with the assumption that it had been published in MODEL AVAITION. When this was found to be untrue, the proposal (now in the form shown under number VII on the ballot) was re-submitted for the six-month study period. Since this proposal was put forth as a "beginner" class, which it is not, (if you don't believe it, build one to the letter of the rule) we feel that it cannot serve any good purpose, and would eliminate the most popular rubber event we have.

Proposals #I, IV, V, and VI all deal with methods to close the loop-hole that permits microfilm covered gliders that "soar" to compete with balsa gliders. #I and #V close the door on the possibility of this type of glider, while #IV (intended to replace large sections of the rule as it stands) establishes a class for each type of glider. Proposal #VI, suggested by Hatschek as an alternate that combined the best features of the other IHLG proposals, presumably would not still be in the running unless Phil Klintworth felt it should be submitted with the other proposals.

Proposal #II (separate from other HLG proposals) deals with a change in scoring IHLG and has no effect on the elimination of "mike" gliders.

Proposal #III is self-explanatory, and again is not intended to "go with" any of the other proposals by the Detroit-Chicago-Wilmington groups.

#VIII was included on the ballot merely as an opinion poll to determine if there was any feeling for an enlarged limit or no limit on Class D Indoor Stick wing area.

Last time, there was some confusion about the IHLG items on the ballot and some members voted for two of the proposals and thus negated their vote on that matter. Therefore, please note these stipulations:

1. Vote for only one of the following: ~~I~~, IV, & (V),
2. Vote for or against these on their own merits: ~~II~~, (III), ~~VII & VIII~~.
3. Votes cast for ~~VI~~ in lieu of a vote for one of those in stipulation #1 will be reported to the CB as an indication of feeling that this proposal has sufficient merit to be submitted.

Since items on this ballot cover every phase of indoor flying except Indoor Cabin, each NIMAS member who actively flies contest (except specialists in Cabin) has a stake in the outcome of these rules proposals. Please feel free to omit a vote on an issue out of your field, but please do return the ballot. These are your rules! Return the ballots to Box 545, Richardson, Texas.

****SPONSORED JUNIOR MEMBERSHIPS****

Last month our mail yielded up a check for $9 from a NIMAS member who prefers that his name not be used. He felt that many juniors, very interested in indoor but with a limited budget, could use some encouragement in becoming NIMAS members. So his check is the start of a fund to sponsor junior NIMAS memberships, with the cost to the junior only $1.

As with all matters of policy, the NIMAS charter members were consulted on this fund. It has been decided that the fund will be handled in this manner:

1. Any AMA Chapter or Charter Club may nominate one of their junior members as the most deserving junior indoor flier in their club. In the case of fliers in areas with no clubs, special consideration may be made.

2. The club will then notify INDOOR NEWS of this nomination, the junior will pay $1, and the balance will come from the fund.

3. Each club is limited to one such membership per year unless the club wishes to donate additional money to the fund for extra members.

4. Each junior is eligible for sponsored membership for one year only, but he may renew as a regular member.

The staff of INDOOR NEWS is happy that this fund has been started, and has added $3 to the fund. This now makes six Sponsored Junior Memberships available, and we invite further contributions to the fund.

****FAI INDOOR REPORT****

FAI Indoor Committee

Since last month the entire FAI indoor committee has been activated. The members are:

CHAIRMAN:
Dick Kowalski
20203 Moenart
Detroit 34, Michigan

EASTERN ZONE:
Bill Bigge
5131 Mass. Ave. NW
Washington 6, D.C.

CENTRAL ZONE (North):
Paul Crowley
16835 Lilac
Detroit 21, Michigan

CENTRAL ZONE (South):
Bud Tenny
Box 545
Richardson, Texas

WESTERN ZONE:
Dave Copple
823 S. Mariposa, Apt. #1
Los Angeles 5, California

Elimination Schedule

A complete series of elimination contests will be held in each of four areas of the United States, the extra area coming from having the Central Zone split into two geographical areas, due to the wide-spread activity there. Following a policy established by Joe Bilgri in 1961, a flier may consider himself in that area which will be the easiest for him to reach at elims time. In case of doubt, contact the nearest zone chairman for more info.

The following dates have been announced for elims, and those marked * have been confirmed.

West Coast Local Elims
Wilmington, California - April 12, 1963*
Andy Faykun, 9410 Dayton Way, Beverly Hills, Calif.

Santa Ana, California - April 14, 1963*
Bruce Paton, 1010 N. Mirasol St., Santa Ana, Calif.

West Coast Quarter Finals
Santa Ana, California - May 5, 1963*
Bruce Paton, 1010 N. Mirasol St., Santa Ana, Calif.

West Coast Semi-Final Elims
Santa Ana, California - June 2, 1963
Bruce Paton, 1010 N. Mirasol St., Santa Ana, Calif.

Central Zone Local Elims
Cleveland, Ohio
Chuck Tracy, c/o Cleveland Press, Cleveland, Ohio

Chicago, Illinois
Pete Sotich, 3851 West 62nd Place, Chicago, Ill.

Detroit, Michigan - April 21, 1963
CD not named yet.

Dallas, Texas - March 17, 1963
CD not named yet.

Central Zone Quarter-Final Elims
Chicago, Illinois
Pete Sotich, 3851 West 62nd Place, Chicago 29, Ill.

Detroit, Michigan - May 12, 1963
CD not named yet.

Dallas, Texas - April 20, 1963*
CD not named yet.

Central Zone Semi-Final Elims
Detroit, Michigan, June 8-9, 1963
CD not named yet.

Dallas, Texas - May 18, 1963*
CD not named yet.

East Coast Quarter-Final Elims
Lakehurst N. A. S. - May 5, 1963
C. V. Russo, 143 Willow Way, Clark, New Jersey

East Coast Semi-Final Elims
Lakehurst N. A. S. - June 2, 1963
C. V. Russo, 143 Willow Way, Clark, New Jersey

Chairman Kowalski has announced the following stipulations regarding the holding of elimination contests:

Local Elims

1. Must be held before the end of April, 1963
2. At least three entries must be flown.
3. Can be flown under any ceiling.
4. Entry Fee: Open $2.50, Seniors $2, Junior $1
5. Use FAI rules as provided by the FAI Committee
6. No rounds to be used, other than those made necessary by the site.
7. Top 50% of entrants qualify for entry in Quarter Finals. A qualifier unable to attend Quarter Finals is obligated to notify the next in line.

Quarter Finals

1. Must be held before the end of May.
2. Qualifiers are entitled to enter any or all Quarter Finals held in their Zone.
3. Should be held under the highest appropriate ceiling available.
4. Entry Fee: All contestants, $3
5. FAI rules exclusively, as above.
6. Rounds will be used, or if possible, the C.D. may elect to require 3 flights by a certain time limitation.
7. Qualification for the Zone Semi-Finals:

EAST COAST:
Northern Area - Top 10 or top 80% of entry, whichever is fewer.
Southern Area - Top 5 or top 80% of entry, whichever is fewer.

MID-WEST:
Detroit - Top 12 or top 80%, whichever is fewer.
Chicago - Top 8 or top 80%, whichever is fewer.
Dallas - Top 6 or top 80%, whichever is fewer. (This may be amended pending further planning on the South Central Semi-Final.)

WEST COAST:
Northern Calif. - Top 8 or top 80%, whichever is fewer.
Southern Calif. - Top 10 or top 80%, whichever is fewer.

Zone Semi-Finals

1. Must be flown before the middle of June, about 4 weeks after the quarter finals in that zone are completed.
2. Qualifiers are entitled to enter only that Semi in their zone.
3. Should be flown under highest available ceiling.
4. Entry fee: All contestants, $3
5. FAI rules exclusively, as above.
6. Rounds will be used, or if possible, the C.D. may elect to require 3 flights by a certain time limitation.
7. Qualifiers: 1st, 2nd, and 3rd place winners at all three Zone Semi-Finals. (This may be amended later, due to the Southern Semi.)
8. To qualify for free transportation, qualifiers must:
   (a) Commit himself to the Committee Chairman within 7 days after the Semi-Finals, otherwise the next man in line will be given his transportation.
   (b) Commit himself (in intent) to attend the World Championships, in writing, at the same time as transportation is requested. (Provided that he wins a team position.)

Semi-Flyoff

1. FAI rules exclusively, as above.
2. Time limitations to be decided by the Committee, when necessary.
3. Will be flown during the week of the National Championships but not during the National Indoor Championships meeting.
4. Entry fees: All contestants, $5.
5. 1st, 2nd, and 3rd place winners will comprise the 1964 U.S.A. Indoor Team providing: They re-affirm their committment to attend the World Championships during 1964 within 90 days following the Nationals.

FAI INDOOR RULES

The FAI Indoor Committee recommends the following to be used until such time as the C.I.A.M. prints an Official Indoor Rule Book.

1. A model is said to be an Indoor Model only when it can be flown properly within an enclosed room.
2. The wing span of Indoor Models shall not exceed 90 Cm. (35.4") Other structural details are left to the contestant only.
3. Only rubber power is permitted.
4. Flying time shall begin when the model begins its independent and unaided flight.

5. The time of flight shall cease when the model lands or hits an obstruction during flight and remains stationary, that is to say, has no flying motion for six seconds. In this case, the timer shall continue to time for an additional six seconds after the moment of impact and shall then subtract six seconds from the flight time.
6. If, while in flight, the model drops any of its parts, the flight time is calculated only to the moment of the dropping of the part.
7. It is strictly forbidden, during a contest, to influence the flight of the model, either by the hands or by any object, or by producing an artificial air current, except as follows: "Balloons may be used to alter the flight path, although the balloon or the tether may only be in contact with the model for a period of 10 seconds and not more than twice during any flight."
8. All flights are official and recorded except when the model collides with another model already in flight. The contestant may, at his option, declare the flight a "no start" but the decision must be voiced to the timer at the moment of separation of the models.
9. The total of the best two flights of all 6 shall determine the winner.
10. Each contestant is allowed 3 models to complete his flights.

FAI ÷ 2?

Last month we used this same heading to announce more comments and stuff about Boyd Felstead's proposal to lower the maximum wing span for FAI Indoor models by 1/3, or to about 24" span. Boyd pointed out that our comments had shrunk the model more than he intended - and he's right! However, we used this gimmick (or intended to, anyway) to point out that the new size would be about 1/2 the wing area of the present FAI class. All clear?

Now, on to the battle. A surprising number of fliers are expressing comments in favor of the change, with one major point in favor being that the outcome of the World Championships both years was largely affected by drift. The smaller models with potential maximum flight time 35% less (based on current prevalent estimates of maximum potential time - "B"=35 or 36 minutes; "FAI"=55 minutes) would certainly be less affected by drift.

The major point expressed so far against this proposal is that the rules should not be changed indiscriminately. There should be a very good reason for any rules change, rather than to change the rules for the sake of change. We should be sure that such a change will benefit the FAI program and the fliers before we seriously consider it.

One other interesting protest of the proposal came from Bill Bigge: "Note that FAI is a smaller size than the full "D's". If reducing the size did not reduce average flight time, it would be rather pointless. If it did, it would be gravely wrong. Let's not throw away the quest for the natural ultimate which, for me at least, constitutes the appeal of indoor as against outdoor aeromodelling."

THE LAB

Tests And Measurements

The indoor fliers of the world are faced with an interesting challenge - that of developing the best possible man-and-model teams to try and win the World Indoor Championships.

Last year at the Nats and the Detroit Semi-Final, NIMAS members came up with the idea of a set of standards for test and measurement. These "NIMAS Standards" were to be practical standards, non-destructive in nature if possible, and should be such that anyone could build the equipment and make the tests for himself.

In our correspondence with one another, we mention that such-and-such rubber is better than the last we had, that a new film formula makes better film than we've ever had before, etc. However, we have no standard tests to base these comments on, so they are less meaningful than they might be. Why tests? We all test our building materials some way to see how good they are. Our present testing is rule-of-thumb - but everyone has a different thumb! It has been proven that no group endeavor can function effectively without a system of meaningful communication to transmit results from one member to another. NIMAS Standards can furnish the language for communication so that our test results can be understood and used. This is the only way we can truly advance the state of the art efficiently.

The purpose of this new column, which will appear as material is received and organized, will be to encourage systematic testing and development. A rubber testing article has been promised, but we welcome suggestions for test topics and testing methods. We envisioned a series of tests for microfilm solution, and have used and evaluated some of these tests.

Testing Microfilm

In order to fully describe and test any film solution, several parameters or characteristics need to be evaluated to give a complete picture. For example, nitrate dope is nitrate dope, but various samples will have different amounts of solvent. This will affect the viscosity of solutions mixed with the dope, and thus change the rate of pour and spread. These are suggested characteristics for film testing:

1. Viscosity (of any sample solution). The simplest test would be rate-of-flow from a standard orifice. We selected a 2 milliliter eye-dropper and ground off the tip until the orifice was .100" in diameter, then marked it off at the 2 ml. and 1 ml. points. In use, it is filled to the top and permitted to drain. The rate of flow is timed from the upper mark to the lower, which will give comparative viscosity for various samples.

2. Standard pour rate. In order to duplicate color in successive sheets of film, two factors must be duplicated: rate of flow and rate of distribution. Fifteen different jets were made for the microfilm pouring spout (INAV, Aug. 1962), but so far no non-mechanical method of duplicating the rate of distribution has been devised. Tests indicate that close duplication of these two parameters will give close duplication of film color and weight, but without a mechanical pouring mechanism this test will remain subjective.

3. Rupture strength. This test mechanism has been well tested, and results are fairly well defined. Test frames 6" x 12" from 1/4" square balsa were used to make the test samples, and the cured film was loaded in the center by using half a table tennis (ping-pong) ball and lead shot. Some light samples (about .0006 oz./100 sq. in.) have withstood 81 lead shot loaded into the ping-pong ball before rupture. One sample weighing about .0012 oz. per 100 sq. in. supported over 200 lead shot and still did not rupture! The cup was running over!

4. Weight per unit area. This test requires only a very sensitive scale and the ability to wreck large sheets so they can be weighed. (It seems such a waste!) These sheets should be about 300 sq. in. for good accuracy.

5. Dimensional stability. This is important if we are to build very light models - non-stable film will soon warp all but the heaviest structure. So far, no test apparatus has been devised. Suggestions, anyone?

6. Stickiness test. We propose to prepare small frames 1" square, cover them with film, and cure them. This test "patch" will be put in contact with the larger frame of the same batch and the force required to separate the patch from the film will be measured. Very "dry" films will not stick, and very sticky samples would doubtless fail to separate.

7. Two parameters that could be tested are flammability and rate of cure. The first is important if you trim with a hot wire, and the second if you are in a hurry to use the film. Comments, anyone?

RECORDS? MAYBE!

Just after we went to press last month, Pete Sotich sent a list of records applied for after a record trials in Chicago on December 29, 1962. They are:

CHICAGO AERONUTS INDOOR RECORD TRIALS, December 29, 1962
CAT. I, Madison Street Armory (Lecture Room) (22')
Jr. Helicopter - 3:52.4, David Erbach
Sr. C Cabin - 3:35.2, Tommy Neumann
Sr. Helicopter - 2:41.4, Dennis Kargol
Open Helicopter - 5:41.7, Walter Erbach
Jr. Ornithopter - 0:30.1, David Erbach
Cat. II, Madison Street Armory Drill Hall (75')
Jr. B Stick - 14:14.3, David Erbach
Sr. B Cabin - 4:08.4, Dennis Kargol
Sr. Autogyro - 0:16.8, Dennis Kargol
Sr. Helicopter - 3:26.1, Dennis Kargol
Open Paper Stick -16:19.6, Charles Sotich
Open B Cabin - 5:23.5, Walter Erbach
Open Helicopter - 5:50.8, Walter Erbach

STATE OF THE ART

This month the featured model has several unique and interesting features, along with the distinctive planform. It was designed and flown by Tommy Neumann and holds the Category I "D" record. At one time it also held the Senior Cat. I "D" record. It has also held the Sr. Cat. II record, as Tommy see-sawed back and forth with Jim Skinner during the 1962 FAI elimination contests. The design holds a high time (unofficial) of over 28 minutes in the Madison Street Armory, set during a practice meet just before the Central Zone Semi-Final in 1962.

The design features which differ from common practice are the swept outlines on wing and stab, semi-stressed dihedral and an up-swept rudder. The rudder location is believed to give better handling under drift conditions, while the swept outlines and semi-stressed dihedral give a better chance of sliding off lights and obstructions such as are common in our Cat. I and Cat. II sites. The major objection to this bracing scheme, according to Tom, is that the wing tips wash-in during a tail slide after hang-up, forcing the model to fall over upside down.

HINTS AND KINKS

Ever since the advent of low ceiling flying, one of our major problems has been controlling the climb of our models so that we can avoid hang-ups. In the past, we have braced our fuselages so that they will be lighter for a given degree of stiffness. Although we first saw this combination of altitude control and fuselage bracing as used by Dick Kowalski, in recent months we have had several different variations of the same theme come in as suggestions.

Figure 1 (page 5) shows a side view of the bracing scheme. The total weight added to an unbraced model is low, and consists of a length of tungsten wire, two adjustment plates made of 1/64" balsa, and enough glue to add these parts to the model. Figure 2 shows a close-up of the adjustment plate and method of installation. The wire is formed into a loop at one end (figure 3) and the opposite end is secured to the fuselage at the rear hook.

During the adjustment procedure, the fuselage is permitted to bow under full winds so that the peak altitude reached will be just below the ceiling. If you have to fly in a higher ceiling, the wire can be moved up to a higher set of notches to permit a higher peak climb. Figure 4 shows a feature which should be built into new models scheduled to use this technique. Since the posts "bottom out" in the sockets (they must be cut to length) the sockets should be reinforced with a balsa plug at the bottom.

After having used this technique on two models so far, we can whole-heartedly recommend this as the most useful adjustment we've seen. Incidentally, the model is assembled as usual, and then the bracing wire is passed through the wing bracing, hooked over the thrust bearing, and then hooked into the proper notches.

One other suggestion: Lew Gitlow has suggested that a short length of jeweler's saw blade be substituted for the front adjustment plate, and a wire peg for the rear plate. The saw blade has much closer spacing than is possible to make in balsa wood, thus permitting finer adjustment.

Prop Block

The continuing good results and simplicity of the Bilgri-type mono-spar prop makes it the most popular prop design to date. One difficulty has always been that the spar, when large enough for the required strength, is so high that it is difficult to join the narrow blade outline to the spar. Bob Champine uses a router to gouge out clearance for the spar near the hub, permitting the outline to be built flat on the block and still join the spar in the center. Bob also (see figure 5) uses small balsa scraps to outline the blade, assuring identical size blades.

AIRFOILS

Since the subject of airfoils has largely been left out of this newsletter (primarily due to lack of info) it is high time we establish this column to air such information as we receive it.

The Equiangular Spiral

This curve, or perhaps it could be called a family of curves, has one outstanding feature of convenience. If ribs are cut to this curve, they can be trimmed in length by cutting off the trailing edge. The rib that remains has the same % thickness and the high point is located at the same % of maximum chord. Thus it becomes unnecessary to plot new ribs for different chords - just make a template for the largest chord you need and cut all ribs with that template.

This airfoil is somewhat involved to plot, but here is the method. First, the general equation of the curve is: $\rho = ae^{k\theta}$ where:

ρ is the distance from the origin
e = 2.71828... the base of natural logarithms
a is an arbitrary constant
k is a constant which determines airfoil thickness
θ is the angle ρ makes with x axis (in radians)

LET $a = e^{-\pi k}$

THEN $\rho = e^{-k(\pi-\theta)}$ OR $e^{-k\frac{(180-\theta)}{57.29}}$ (if θ IS IN DEGREES)

LET $k = 4.58$ (8% THICKNESS)

$$\rho = e^{-4.58\frac{(180-\theta)}{57.29}} = e^{-.08(180-\theta)}$$

$$-.08(180-\theta) = \ln \rho$$

$$.08(180-\theta) = \ln \frac{1}{\rho}$$

The following values of k will give the thickness indicated:

k	9.2	7.35	6.1	5.25	4.58	4.05	3.65
T	4%	5%	6%	7%	8%	9%	10%

Richy Earle "turned the crank" for us and produced the following set of values for k=4.58 (8%):

θ (degrees)	$\ln \rho$	ρ	θ (degrees)	$\ln \rho$	ρ
90	-7.2	<.001	170	-0.8	.449
105	-6.0	.0025	172	-0.64	.527
120	-4.8	.0082	174	-0.48	.6185
135	-3.6	.0273	176	-0.32	.726
150	-2.4	.0907	178	-0.16	.852
160	-1.6	.2018	179	-0.08	.923
165	-1.2	.301	180	0.0	1.000

To further clarify this method of plotting airfoils, see the sketch at the bottom of this page.

NEWS FROM AROUND THE WORLD

CALIFORNIA - SANTA ANA

High winds outside the hangar caused all the helicopters to be moved inside. This, plus cold weather held times down on Jan. 13. Some flights: Cummings - 37:55, (300 D); Finch - 33:56 (C); Redlin - 32:30 (FAI); Atwood - 32:10 (geared FAI).

The Feb. 3 RT was going full blast until the entire Marine squadron was mobilized at 3 PM and the hangar was opened to move the helicopters out. Before that, these times were posted: Cummings - 34:29 (1100 turns, 300D, RPM 321); Gitlow - 32:02 (B); Bilgri - 33:29 (FAI); Atwood - 32:40 (geared FAI); Paton - 31:38 (geared FAI).

CANADA - VANCOUVER

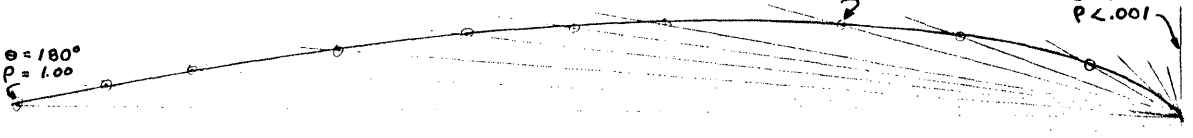
Last month we asked for contributions on indoor to be sent to Greg Stephenson (we even mis-spelled his name) in Vancouver, Canada. As some of you found out, we gave the wrong street address. It should be: Greg Stephenson, 3885 West 36th Avenue, Vancouver 13, B. C., Canada

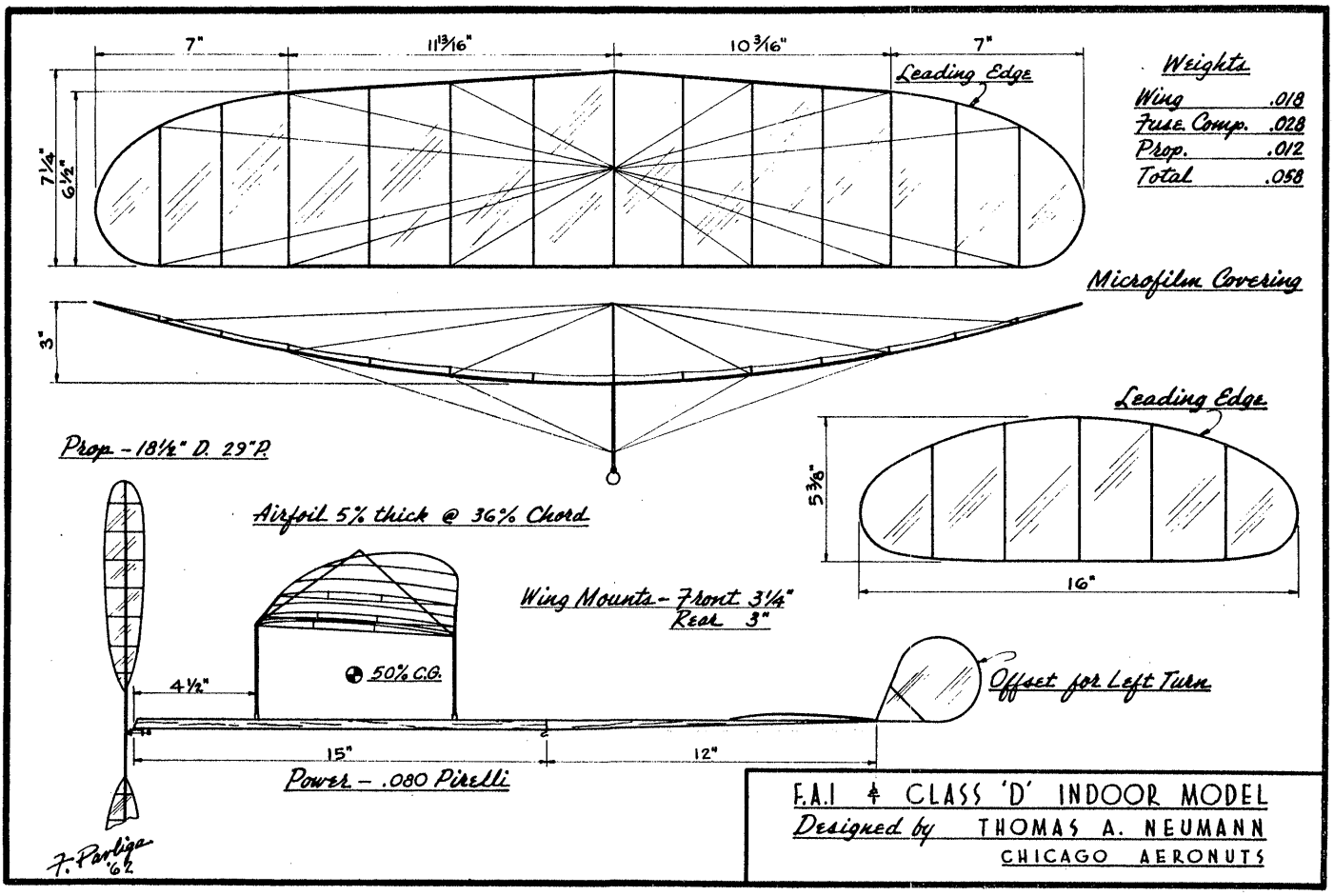
COLORADO - DENVER

George Batuik reports that a new site 40' high with floor 118' x 290' has been opened up. The Martin Model Masters have already held two indoor contests, with three more coming up. Contact George at 3066 S. Osceola, Denver, for more info.

FINLAND - HELSINKI

The Annual New Year Contest was held in the Helsinki exhibition hall in very cold weather. FAI times: Esko Hamalainen - 13:52; H. Raulio - 9:20; K. Karma - 8:55. The activity is very slow in Helsinki due to the extreme cold - but the skiing is fine!





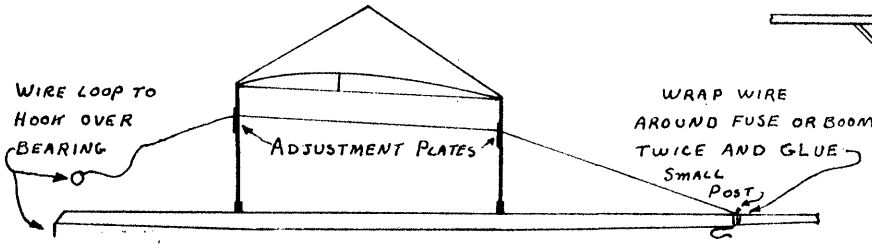
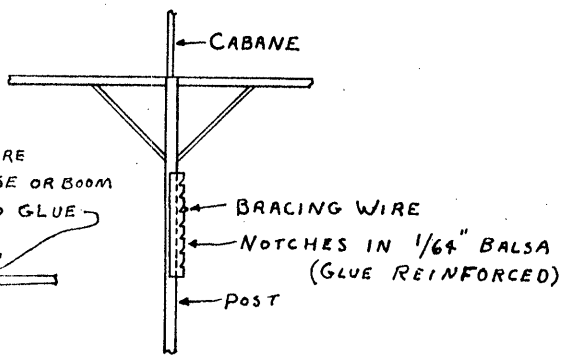
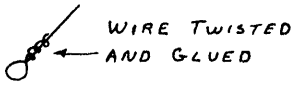


FIGURE 1



ADJUSTMENT PLATE DETAIL
FIGURE 2



DETAIL OF LOOP
FIGURE 3

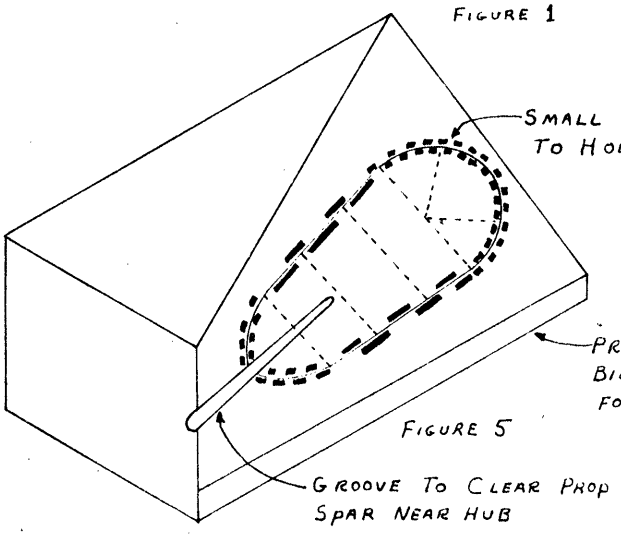
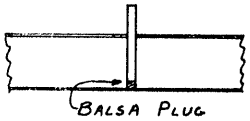


FIGURE 5



SECTION OF FUSELAGE AT WING SOCKET (BOTH SOCKETS)
FIGURE 4

INDIANA - KOKOMO

Chuck Borneman's contests are well attended by fliers from all over, and the events are hotly contested. Easy B times are over 7 minutes, with less than a minute between 1st and 3rd places. HLG times are up to 42 sec. with top time now held by Bob Larsh. The Kokomo MAC has challenged the Chicago Aeronuts to an Easy B and glider contest. The challenge has been accepted and the bash takes place February 3.

MASSACHUSETTS - CAMBRIDGE

The Tech Model Aircrafters of MIT have a monthly flying schedule in the MIT Armory on these dates: Feb. 9, March 2, March 23, April 20, May 11. Contact Eric Greenwell, 420 Memorial Dr., Cambridge 39, Mass.

MISSOURI - KANSAS CITY

The Sodbusters club is planning a scale indoor contest sometime soon. For info write Jim Dunkin, 10411 East 39th Terrace, Kansas City, Mo.

NEW JERSEY - UNION

The Union M.A.C. has been holding indoor contests in the Union High School Auditorium (30'ceiling). This club has several top-notch indoor fliers as members, and they are helping train the other club members. They have two more scheduled sessions: February 28 and March 28.

NEW ZEALAND - AUCKLAND

Jack Eriksen reports that a monthly indoor session is held in a 22' site in Mt. Albert. The times run to 11:51 (Spar class HL) (Cat. I record) and to 7:34.2 for tissue. Jack was somewhat apologetic about these times, but they are pretty good for that ceiling height!

NEW ZEALAND NATS

The N. Z. Nats held indoor for the first time in 12 years. Twenty-four advance entries boiled down to 12 fliers making official flights. 1st and 2nd place models were tissue covered Bilgri "Ditto" with 6:48.7 and 5:26 respectively. Third place was an Easy B with 5:16.7. The site was a cluttered 30' with very rough air that held lighter mike ships to lower places.

OHIO - CLEVELAND

Over 270 contestants braved cold and turbulent air to fly for trophies to fourth place at the Great Lakes Indoor Meet held in the Cleveland Public Auditorium on Jan. 6. Top times: HLG - Otto Heithecker - 1:09.2; Pre-Fab - 2:23, Mike Karlak; B Paper - 12:18.2, Otto Heithecker; Indoor Stick - 15:32.4, Don Eble.

MORE ON EFFINGER

We are very grateful for all the support and letters we received after our "Open Letter To Bill Effinger" in the January issue. Bill Cullen, a member of the Long Island Gas Monkeys, adequately summed up the matter in these words:

"As regards 'pepping up' - or popularizing indoor flying; Please - Hands off! In my opinion, indoor, and the outdoor FAI events, are the highest form of the art, and I don't want them watered down to some common denominator. Rather, I want to improve myself and my airplanes until I can beat the "experts" at their own game.

This is the challenge behind our sport that makes it worth the hours that we spend on it, and from which we derive our pleasure. This is also the challenge that will catch and hold the interest of that one young fellow in a thousand who has the potential to be a serious student of the art. (If we can make him aware of it.)"

QUESTIONS AND ANSWERS

Bill Bigge lumped questions #22 and 23 together and made the following comments on break-in and winding rubber motors:

"Motors may be broken-in by stretching or pre-winding, but pre-winding is probably better. Pre-wind several times, increasing the number of turns until the maximum is reached, keeping the motor well lubricated. A motor wound several times to the practical maximum produces consistent torque on re-winding.

The most effective way to back off is as little as possible. The Germans were taking off exactly one winder turn in transferring to the rear hook. If the torque is excessive, let the prop spin until flexure or RPM looks normal."

Since several groups of low and medium ceiling fliers wind to maximum and back off a certain number of turns to regulate the peak altitude, it would be interesting to hear from some of these fliers for a better description of this technique.

THE HAND LAUNCH GLIDER

PART 12A by RICHARD MILLER

A WORD OF EXPLANATION!

As Bud pointed out in the last issue of INAV my new assignments for American Modeler and Air Progress have kept me hopping for the last several months; 11,000 miles on the Chevvy since August will give some idea of the amount of traveling. Not only was the work load heavy but the constant moving made it momentarily impossible to carry on with NIMAS/East and the HLG series. Although I felt bad about this there was nothing, under the circumstances, that I could do about it.

The regrets about the NIMAS/East activities were softened a little by the state of local conditions. Nobody bothered to contribute as much as a 'boo' to the newsletter and attendance at the armory was downright disgraceful. There were seldom more than 3 or 4 people at a flying session. However quite a number of people had been swindled into paying for the newsletter and now that it has been discontinued might want to make some claims. A fair restitution will be made.

With the HLG series resumed (at least for the time being) this leaves only an explanation of the contributor-bugging technique. Apparently Bud didn't understand that the method (outlined in Jan '63 INAV) applied only to SuperSplootch plans. For installments to the HLG series it is as follows: Take - buy that is - a number of U. S. Government Post Cards, like 25, 26 or 27. Address them all to.....

PART 12B DESIGN (cont.)

Lowering the Boom

Even the most casual comparison of the altitude achieved with a straight, or almost straight-up flight path, and that reached by the traditional corkscrew climb shows a decided gain in favor of the former. Further, it implies that the two-position stab might be the key to generally higher flight times and makes consideration of the flexible fuselage boom as a means of getting those two positions a profitable area to nose around in.

We know from experience that the difference between a properly adjusted glider and one that doesn't quite make it over the top is a shadowy fraction of a degree of trim. We further know that this difference is critical enough to determine whether the glider will recover from a dive or not, and that the faintest of touches on a very small portion of the stabilizer trailing edge can decide the issue. This variation is so slight that it should properly be measured in (angular) minutes, of which a degree has 60. And while we're reflecting about all the agonizing moments that a few minutes of uplift can bring us we can also take time to thank whoever invented longitudinal stability for giving us this minute margin without which our gliders would not fly.

While it usually proves somewhat bothersome to tread this razor's edge of trim in search of the perfect setting, we find that the tables are turned when we want a little extra work out of the combination for other purposes. If the deflection is small, so will be the energy we need to get it. Of course it does set us the task of shaping the boom to precisely the dimensions necessary to get the results we want, but by using the practical approach of trimming the boom during actual flight tests this should not prove to be a great problem. There is the danger of going too far but at least two solutions come immediately to mind. The first is to glue some wood back on, preferably a strip of lighter balsa; the second is to trim away a little stab area if possible.

Now if we're going to work it so that we have slightly fewer minutes (of angle) during the climb we can easily manage to have a few more when, near the top, the stabilizer straightens out the boom. Having seen that a hair's-breadth of decalage can save our skin we can hope that the addition of one breadth more can do at least half that much again. It will certainly tend to dampen stalls more readily and by this token should prove helpful in the abrupt transition that will result from a straight-up launch. And it might even be enough to get around that tip stall problem from which the high A/R designs like the Hi-Hat suffer.

Finally this experimenting with the fuselage, particularly trimming it down to marginal dimensions that affect its flexibility to the point where the launch path is changed, should give a keener appreciation of the structural functions of balsa. Needless to say, good wood and workmanship are essential prerequisites.

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." MARCH 1963

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

Six new members joined NIMAS during February, and at least one has already returned his ballot!

EDWARD R. CENKNER, 19581 Goulburn, Detroit 5, Michigan
W. G. GRAHAM, 1743 Grant Ave., Winnipeg 9, Manitoba
DAVE NICOL, 4497 West 214 St., Fairview Park 26, Ohio
LAWRENCE PACIFICO, 11148 Condon Ave., Inglewood 2, Calif.
GERALD RITZ, 9520 Greenwood, Des Plaines, Illinois
ROSS STECKEL, 7437 Collet Avenue, Van Nuys, California

****SPONSORED JUNIOR MEMBERSHIPS****

The fund which was started last month has now grown to $22. This amount will subsidize eleven junior memberships, with the cost to the junior being $1. So far, no clubs have forwarded nominations, so we still have the entire fund available.

****NIMAS BALLOT****

There has been a most heartening number of ballots returned so far, but we still have a long way to go for the optimum 100% return. If you still have your ballot, please vote on those proposals concerning the events you fly and return the ballot as soon as possible.

Contest Board Action

Chairman Phil Klintworth has distributed to the FF CB a memo reviewing the Solid Motorstick proposal and introducing a proposal for the addition of F.A.I. Indoor Models as an AMA category. He plans to follow up with action on other outstanding proposals at an early date. Good Work!

Back Issues?

There are a few back issues of INDOOR NEWS available on a first-come-first-served basis. For NIMAS members the cost is 25¢ handling charge, and for non-members the price is 10¢ per copy.

We have a few copies of back issues on hand that are available to NIMAS members for a 25¢ handling charge, or for non-members the price is 10¢ per issue. In addition, we plan to reprint back installments of "The Hand Launch Glider" by Richard Miller. We have some orders now, and if you would like to complete your set, let us know which issues you want. Since the number of orders will help to determine the method of reprinting and also the price per copy, get your orders in soon!

IS YOUR WING AREA LEGAL?

Some time ago it was customary to use the formula Area=0.8 x max. chord x wing span (projected) to figure the wing area of the parabolic development planform with "V" dihedral.

On page 206 of the 1959-61 Zaic Yearbook, Ray Harlan gave an excellent discussion of this problem, and proved that the coefficient should be .8333. This results in a larger wing area than would have been figured by the old method, which could be a shock if your area was pretty close to begin with.

This topic comes up here by request of Frank Ehling, who received a letter a while back asking about this very topic. By the way, the same article by Ray also has the formula for the same planform with tip dihedral. We won't reproduce it here, since it is quite complex, but if you like a neat mathematical discussion, try Ray's article.

FAI INDOOR REPORT

Local Elims Schedule

Due to late confirmation of sites and late planning, this may not be a complete listing of local elims. Please check with the FAI Indoor Committee rep for your zone if you want more info.

DALLAS, TEXAS, March 17, 1963
Bud Tenny, Box 545, Richardson, Texas
MOFFET FIELD, CALIFORNIA, Hangar #1, March 24, 1963
Joe Bilgri, 1255 Blackfield Dr., Santa Clara, Calif.
(Please contact Joe at least 10 days in advance so he can complete security info for the Navy.)
WILMINGTON, CALIFORNIA, April 12, 1963
Andy Faykun, 9410 Dayton Way, Beverly Hills, Calif.
SANTA ANA, CALIFORNIA, April 14, 1963
Bruce Paton, 1010 N. Mirasol St., Santa Ana, Calif.
CHICAGO, ILLINOIS, April 20, 1963
Pete Sotich, 3851 West 62nd Place, Chicago, Illinois
DETROIT, MICHIGAN, April 21, 1963
Paul Crowley, 16835 Lilac, Detroit 21, Michigan

FAI Indoor Committee

CHAIRMAN:
Dick Kowalski
20203 Moenart
Detroit 34, Michigan

EASTERN ZONE
Bill Bigge
5131 Mass. Ave., NW
Washington 6, D. C.

CENTRAL ZONE (North)
Paul Crowley
16835 Lilac
Detroit 21, Michigan

CENTRAL ZONE (South)
Bud Tenny
Box 545
Richardson, Texas

WESTERN ZONE
Dave Copple
823 Sourth Mariposa, Apt.#1
Los Angeles 5, California

WE GOOFED!

Last month we published a list of rules suggested by the FAI Indoor Committee. Rule #10 stated that only 3 models may be used by a contestant to complete his flights. Actually, the C.I.A.M. has ruled that there shall be no limit on the number of models used. Sorry!

LOW CEILING FORUM

Last month we received the following comment: "I have read numerous magazines, etc. on indoor works, but they all leave me COLD. They are talking to someone I am sure, but I doubt if it is any of the indoor fliers in our area. I can't even imagine what this 75 and 150 foot ceiling flying would be like; we, and I think a great many fliers, can use help, suggestions, and results of experiments in 25 to 35 foot gyms where you can't keep bouncing from basket to basket without getting hung up. In other words, starting with a basic 8 or 9 minute plane what do you do to get 10 minutes? I believe you have the idea."

As most of you know, the Dallas area indoor fliers are blessed (or afflicted) with fairly frequent access to the Walnut Hill Recreation Center, a 20' gym in North Dallas. We have had excellent cooperation from Clarence Frank and Glen Dalton, who manage the site as part of the Dallas Recreation program. The only fly in the ointment here is that this building always has drift to some degree, which effectively prevents most attempts at systematic experimentation (it's most frustrating for three flights out of four to hang up at 8 min.+ with 18' of altitude and lots of turns left!).

Our main problem has been to live with the drift and hope for those rare occasions when it stops. During those few times the mike record (for the site) was boosted to 11:30 (B stick), and the paper time was set at 10:39. It is safe to say that without this site indoor flying would be dead in this area; but your editor and the others can feel kinship with the author of the above comment.

So let this be a plea in behalf of Low, LOW Ceiling Fliers everywhere: Please pass on all comments and suggestions you have for improving times in sites with less than 30' ceilings. Next month we will kick off the Forum in style with comments for the glider fliers by Lee Hines. Anyone else??

AN INDOOR LIGHT BOX

by RICHARD MILLER

I don't think I've built a single HLG wing or stab in the last few years but what I thought how nice it would be to work over a piece of glass which was illuminated from below and thus be able to watch the sanding as it progressed. The idea finally caught up with me and I went off to the neighborhood glass shop and got the fixin's, stopped at the local lingerie shop for some gift wrapping paper and picked up a GE bulb FG (for gliders?) #1048-AX which is a tubular frosted bulb about five inches long. An hour after getting home I had used this assortment of odds and ends to make a stabilizer and was very excited about the results.

The first place that the under-lighting came in handy was in placing the template on the sheet of balsa. Grain doesn't always run parallel to the edges - so why should the surface cut from the plank? After some preparatory planing the stab-to-be was placed on the glass for the majority of the sanding. Not only was it possible to work much more quickly by this method but the fine graduations of light which showed through the wood permitted a degree of control in sanding the surface that I had never experienced before.

The technique need not be limited to the HLG however. It should prove just as handy on motor stick and tail boom blanks for mike and paper ships as well as on tapered sheets from which spars are to be cut. And of course if anyone is still carving wooden props the application is obvious.

The pieces of glass I got from the glazier measured 6 x 24 inches, one frosted and one clear, and ended up taped together. The use of frosted glass (like the back plate on a camera) was to diffuse the light. I got the gift wrapping paper in case the the diffusion provided by the glass wasn't adequate - and it wasn't, so one layer of the paper was sandwiched between the two layers of glass. The bulb was frosted for the same resaon and was laid end-wise under the glass-paper-glass sandwich which itself was supported temporarily on a couple of cans.

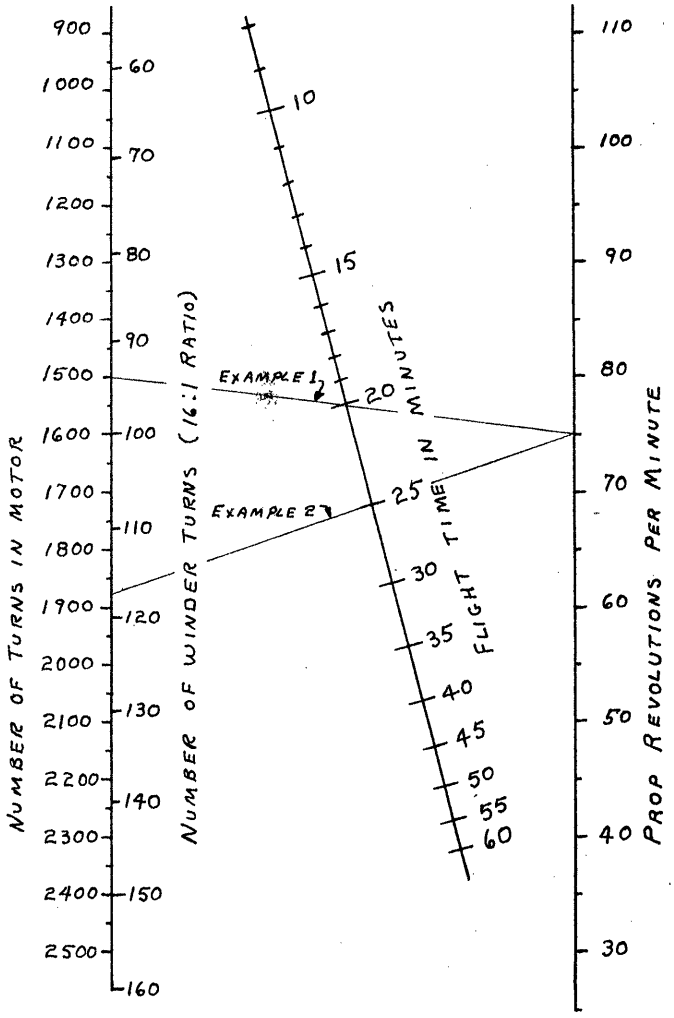
Although the glass didn't cost very much - $2.50 for the two pieces - I think you can do better. I looked for, but could not find, ordinary glass shelving. These standard glass shelves have several advantages, not the least being that they are manufactured in the long thin shapes we want. Secondly they usually have rounded edges which the glazier's glass doesn't - thus the tape. Finally they are designed to be supported at their ends with a load between. If charring were a problem you might try some of the asbestos or glass cloth used by photographers to diffuse spots or floods. Otherwise two such shelves, with opaque paper between them might be better. And the ideal solution to the light source might be fluorescent bulbs which give off a diffused light and come in a variety of lengths.

(continued top of next page)

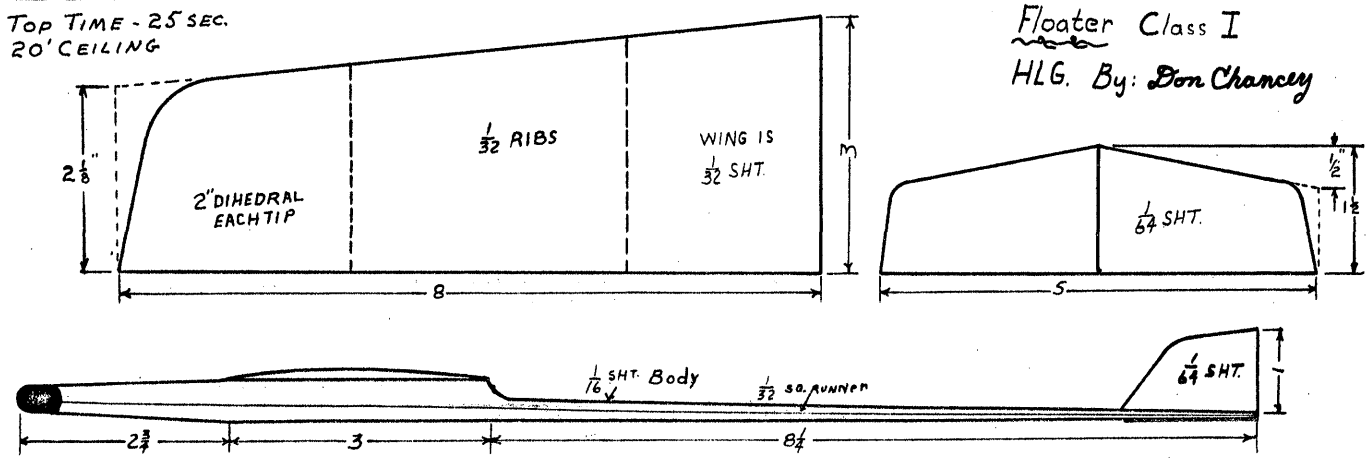
WHAT'S THE R.P.M.?

A major factor of indoor model performance is the RPM of the propellor. As an example, it would be almost a practical impossibility to carry enough turns in the motor to fly for 30 minutes if your model's prop RPM is higher than 80. In a reverse example, many low ceiling models use only part of their turns, landing with quite a few turns left. A smaller prop would use more turns, and possibly the total flight time would be higher.

To use the chart, determine how many turns were used in a flight (unwind and count the remaining turns, subtract this number from the number you started with), and lay a straight edge across the chart at the number of turns and the flight time; where the straight edge crosses the RPM line read the RPM. Example 1: 1600 turns (100 winder turns) were put in and the model landed with 6 winder turns (96 turns) left in the motor. This leaves about 1500 turns used during a flight which lasted 20:05. This figures to be (from chart) 75 RPM. Example 2: With an RPM of 75, it would take almost 1900 turns for the same model to fly for 25 minutes.



FLIGHT TIME & R.P.M. CALCULATOR



Either, or any way you try it, I think you'll find the ability to look into the wood you're working on, rather than simply at it will be well worth the modest investment in time and money.

RECORDS? MAYBE!

ANNUAL INDOOR MODEL AIRPLANE MEET, January 27, 1963
CAT. II, 5th Regiment Armory, Baltimore, Maryland
(75' ceiling, beams at 50' and lights at 35')
Open B Cabin - 11:56, Bob Champine
Open B Cabin ROW - 3:50, Bob Champine

QUESTIONS AND ANSWERS

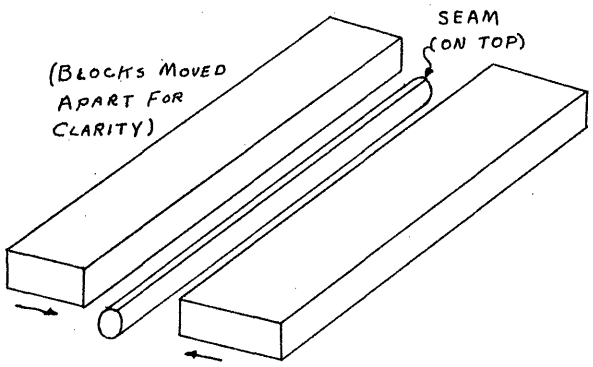
'Way back in November, this column posed the question about the range of thickness for microfilm. We continue to be amazed at the wide range of things which must be considered in attempting to answer this question. So far, two different correspondents have noted experiments along this line, so we hope to be able to cover this question soon. Meanwhile:

25. How do you avoid twisted seams in motor sticks and tail booms?

First, wood with uniform grain must be used, and the blank must be sanded uniformly. Next, it must be perfectly aligned when it is rolled on the form, and a good glue that does not "pull" should be used. Lew Gitlow has suggested these methods for rollong sticks and booms:

Use condenser paper or light tissue as an aid in rolling these tubes. While the sanded blank is soaking, fasten (with saliva or water) one edge of the tissue to the form, and roll up one layer on the form. Carefully align the blank on the tissue next to the form and roll up the blank and the rest of the tissue. Put in the oven at lowest heat for a few minutes and then unroll and glue the seam.

Place the rolled blank between two pieces of 1/4" balsa with the seam on top. Carefully arrange the blank and the jig pieces until the seam is straight and just closed. Then glue the entire seam before removing the stick from the jig. (See sketch below)



THE HAND LAUNCH GLIDER

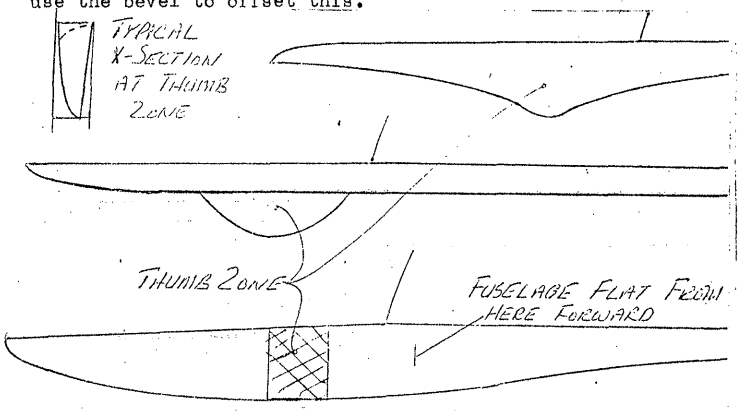
PART 12 (cont.) by RICHARD MILLER

Finishing the Fuselage

Although none of the remaining sections of the fuselage is as important as the boom each one has a specific job to do and should be designed so as to best do it. That part of the fuselage directly ahead of the wing where we hold the glider between our thumb and middle finger when launching it is an area with a very definite function. It should provide a convenient point of purchase and along with a properly designed and executed finger grip make the glider fit our hand the way a comfortable old glove might. This easy feeling in the hand, which some gliders have and others haven't, can contribute a lot more than you might suspect to good control.

If the fuselage, where we press against it with the thumb - the "thumb zone" - is rounded and not too deep it is not going to give us the kind of grip we need. Why not, then, make this area both flat and deep enough to give us a fair degree of purchase? (And while we're about it why not keep it flat all the way to the nose in case we want to add a lead slug up there later?) We can also flatten the right side of the fuselage to an extent, but the fact that the middle finger rests laterally on that side makes it less essential.

As a rule of thumb (agrrr!) I make the T-zone about 1/8" deep for every 10 sq. in. of wing area; and because most of my gliders are close to 50 sq. in. this dimension is usually 5/8". And because my hand is fairly large I find that the thumb area is 4-3/4" forward of the wing t.e. - although this will vary with the individual. One more factor of personal preference enters finally - whether the flat area will be bevelled to any degree (giving a sort of V-shape to the fuselage cross-section). This will determine to some extent the amount of bank the model assumes during the launch. I usually have trouble getting my gliders banked enough during the launch and use the bevel to offset this.



A few scattered sections remain. We will not want those portions of the fuselage onto which the wing and stabilizer will ultimately be cemented to be true and in a proper relationship to each other. The piece of wood that supports the stabilizer is both heavy and a long way from the C.G. so it pays to trim it to fare-thee-well. What remains now is to put all these pieces, controlled as they are by the moment arms we desire, together into a functional entity.

Insomuch as most fuselages are invariably deeper at the front than at the rear, stringing the elements together usually includes throwing a curve in somewhere along the line. Sharp curves should be avoided at least in places where there is liable to be stress - such as the top of the fuselage just behind the t.e. of the wing which seems to be a favorite thinning-down spot. Lee Hines uses a very gradual sweep - on the Sweepette - in that area but also keeps the fuselage deep enough right there so that breakage is highly unlikely. An alternative is to put the curve under the wing where it is liable to do no damage, drop it down to include the thumb zone, then bring it back up to a fairly sharp nose.

Next month: Design Resume and an Exhortation.

A WORD OF REBUTTAL

An open letter to Richard Miller:

Dear Richard;

As I read "The Hand Launch Glider," part 12B, some of your words on flexible booms used to lower decalage for climb straightening brought some thoughts to mind of observations of my past gliders.

Naturally, many sizes and shapes of tail booms have been constructed for those gliders, with varying flexibility and density; also (naturally) with varying results.

I first want to make it clear that I feel your methods for achieving the climb you desire (as described in part 12B) to be so impractical (and virtually non-reproducible) that one's mentality would be severely shaken by frustration!

I secondly feel that good wood and workmanship, no matter who is the builder, will not be the help you think.

Recalling specific examples now, the shallow, wide (more round than oval or teardrop) type of boom sometimes decreases decalage at launching speeds. The difficulties which arise are, in my mind, (1) that flexing and therefore decalage varies with force applied during the launch and is therefore virtually non-repeatable; (2) the chances of harmonic high speed flutter and/or twisting of the tail assembly are high; (3) the possibility of much boom

breakage due to marginal structure. The last is much more likely at a crucial time due to our natural tendency to put the last few pounds of force into the launch in an all-out effort to win. Unless you have specific methods (which I can't envision) your booms would surely be marginal in strength.

May I ask, Have actual models been constructed to attempt to evaluate the hypothesis? What would be the boom cross-section and rate of taper for the test models?

The most recent experience I have had with flexing and its effect came with the latest "Sweepette 13," which was the first I had built for an unlimited ceiling. For various reasons, I made it strong with 6 lb. wing stock and a spruce fuselage. The finished weight is 20.5 grams. The cross-section of the spruce is teardrop and I now feel that I went a bit small, since on an extremely hard launch it would whip just at launch and go off at an angle many degrees to the right of the desired climb, in fact nearly horizontal for an instant. This has happened on previous gliders of all designs and types. I realize, by the way, that the mass and volume of the tail assembly components are companions of boom flexure. I am sure in this case that the tail components were light enough, smooth and shaped well aerodynamically, and that the boom was simply too weak.

As some may recall, I recorded times of 1:16.2 at Moffet in December 1961, 1:12 at Moffet in March 1962, and 1:18.1 at Santa Ana in December 1962. What may amaze you (or bore you) is that all of these times were achieved with the same glider. This is also the glider mentioned above. The weight remained the same, even though a new stab was fitted before the March session.

In conclusion, I feel that two-position stabs might have some merit, but boom flexure does not seem to be the doorway to 1:20 and up. Now, I will "put up my dukes" and await your comments.

Vehemently yours,

Lee Hines

NEWS FROM AROUND THE WORLD

CALIFORNIA - SANTA ANA

The Sky Hoppers of Orange County are really active in indoor now, flying in a Cat. I site and the hangar. The new site is the Santa Ana Boy's Club Gym (19'), and the times are in the 8-10 minute range.

Their March 3 contest had a total of 52 entries, and lots of bad luck. Several cabin entries scratched due to rubber breakage, Frank Cummings lost a "300" to a few curious pidgeons, and several other fliers suffered from drift all day. Contest results: Stick - 33:43 (C Stick), Tom Finch; Cabin - 18:12, Cummings; Paper Stick - 21:00, Bill Atwood; Easy B - 15:07, Sheridan Asklund, HLG - 1:01, Dave Bales; Biplane Scale - 60 points, Joe Bailey, Monoplane Scale - 64.5 points, Joe Bailey.

ILLINOIS - CHICAGO

The weatherman was right for once in Chicago - he forecast snow which came on schedule and cut down on the entries in the Sixth Annual Chicago Aeronuts Indoor Contest. However, 27 contestants made 41 entries in 6 events and fought hard for top honors. The results: Jr. Paper Stick - 10:16.6, Dennis Kargol; Open Paper Stick - 13:14.0, Charlie Sotich; Jr. Stick - 18:40.5, Dennis Kargol; Open Stick - 22:03.2, Charlie Sotich; Jr. HLG - 0:53.8, Dan Neumann; Open HLG - 1:07.0, Tom Neumann

LOUISIANA - SHREVEPORT

Mark Valerius, prexy of the Shreveport Sky Demons, is trying to find an indoor site so the club (mostly C/L speed fliers) can branch out and also dodge winter weather problems that go along with C/L flying. Good Luck, Mark!

MASSACHUSETTS - CAMBRIDGE

The Tech Model Aircrafters of M.I.T. are making very good use of the M.I.T. Armory(42' ceiling, 37' usable). Three club members have topped 45 seconds with HLG in the Armory, and at the March 3 session Ray Harlan turned 10:25.4 with his B Cabin.

The next M.I.T. session is on March 23 - contact Eric Greenwell, 420 Memorial Dr., Cambridge 39, Mass. for info.

NEW YORK - ORANGEBURG

Flying sessions still are being held in the Rockland Hospital gym, where the fellows are blessed with a 30' clean ceiling. That ceiling helps to account for the good amount of activity in the site, but they have a bit of drift to contend with also.

Recent sessions have seen Ted Pfeiffer out with a very nice flying indoor scale job, and Pete Andrews with a fine new "300"D.

TEXAS - BRYAN

Our good buddy Lee Polansky is continuing his work with juniors, and just recently staged a HLG contest in the 20' gym at St. Joseph's Church. Thanks to his fine coaching, he has a real live-wire group.

VIRGINIA - LANGLEY FIELD

The USAF has given permission for the indoor fliers at Langley Field to use a hangar there. The ceiling is 22' with enclosed beams, and the drift is low. This is a real break for these fellows, since they have been looking for a site for some time.

STATE OF THE ART

In the 1962 FAI elims, Jim Skinner placed 4th in the Cleveland local elims and 4th in the Detroit Quarter-Final with this design. He elected not to fly at the Semi, but his high time at Detroit was a new Senior Cat. II D Stick record which has stood for almost a year. Of the model Jim says, "I am not using the 1/32" wing spars again; they only cause trouble. 1/16" x 1/32" 4 lb. stock seems to be about right for most planes."

Of the prop, he comments, "It is quite similar to Kowalski's 20" prop, except for a slightly wider blade. I believe that a prop with a narrow, high pitch blade is just 'slicing the air into ribbons' - doing plenty of pulling but not very efficiently. Look at the blades of an electric fan - wide and large. Extremely low speed aerodynamics may work differently than expected. Until I can prove some of my ideas or until someone develops a better prop, I will use the design I sent you, or Kowalski's design. For high ceilings, of course, a single spar prop seems to be best."

HINTS AND KINKS

Phil Klintworth sent in our lead-off hint, but it is several hints all rolled into one. The most apparent idea is the tungsten wire brace running the length of the boom, across an adjustment plate like those used in the adjustable fuselage bracing featured last month. This wire serves two purposes: first, it controls and/or prevents tail boom "droop" as the model ages. Second, it permits handy adjustment of the tail incidence.

The real versatility of the bracing post is that it can be used as a center post to brace the tail, or the adjustment plate and incidence wire can be added to an existing model with a braced tail. If the tail is not braced, only the top half of the post is needed; if you use underslung rudders, use only the top half of the post and run the tail bracing to the l.e. and t.e. of the fin.

Now comes the fun: The Detroit Balsa Bugs have long recommended using a small doubler around the boom at both the l.e. and t.e. of the stab. Phil suggests that the boom be made two-piece, with the joint where the front doubler usually is. This saves precious boom wood by giving better utilization of normal size wood (a boom takes just enough wood from one piece that you can't get another from that piece). It also permits a much lighter grade of wood to be used for the rear portion.

Bracing Hint

Larry Renger suggests that the compression member of extension, tensioned properly, and glued at your leisure. shown in Fig. 1. The bracing wire can be run around the extention, tensioned properly, and glued at your leisure. The extra length is then trimmed off after the glue is dry.

"Quickie" Compression Ribs

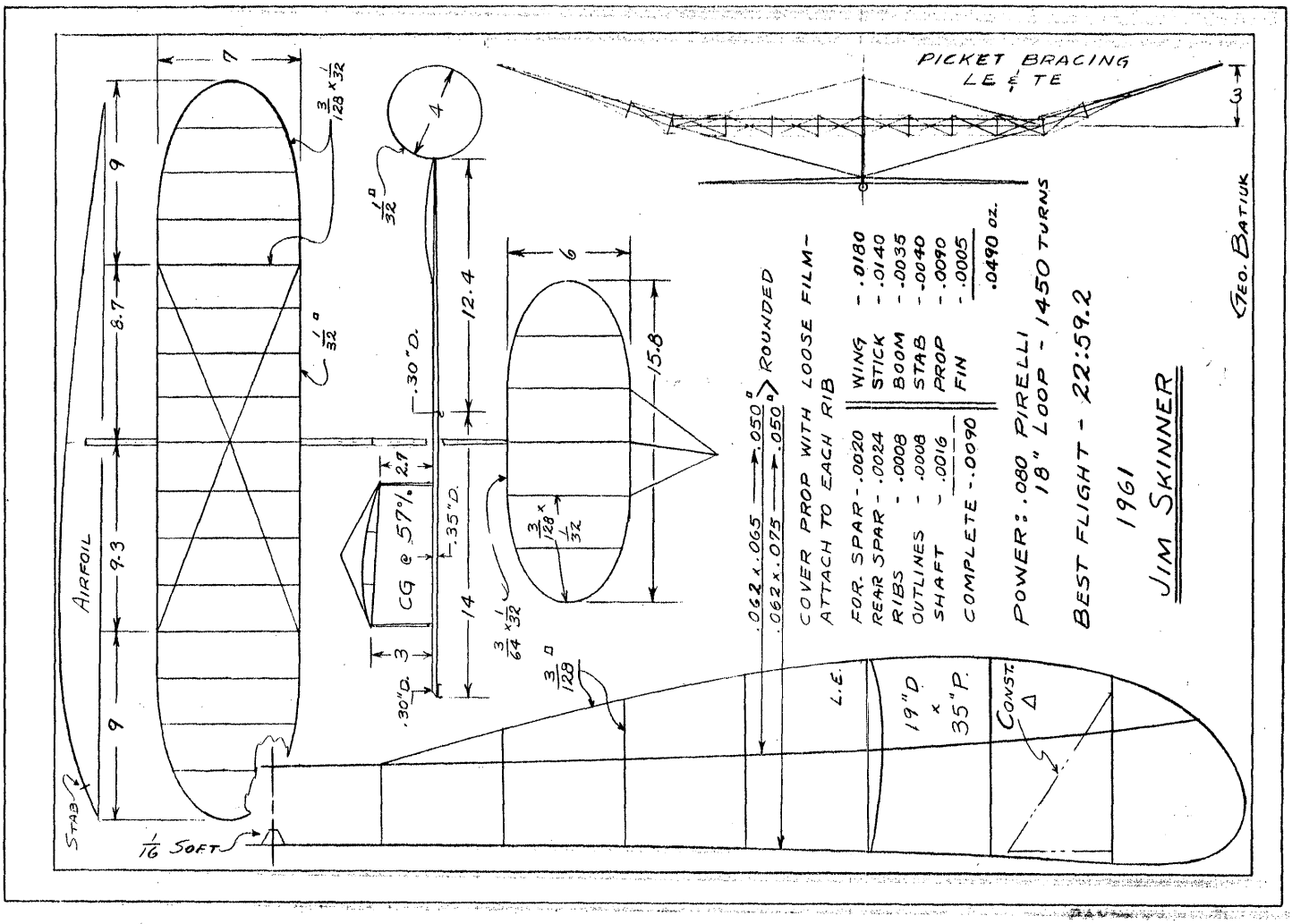
Charlie Sotich showed us this one - it saves lots of time making compression ribs. Instead of cutting the exact length of cross-piece to fit between the members, glue the brace to the side of the rib as shown, then trim it off flush with the rib after the glue is dry.

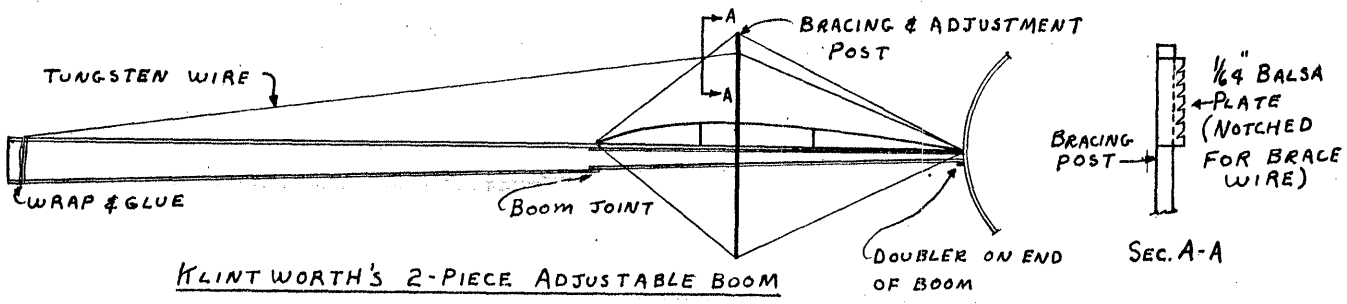
Another Bracing Hint

For some time we had been using small pegs glued to spars and wing posts to hold the wire during the bracing operation. Later, in case of re-rigging or field repairs, the peg may be soaked loose. (More fun!!) If a slightly longer scrap is used with a bevel to hold the wire, thinner can be used to loosen the wire without soaking loose the whole peg. The weight increase is negligible.

And Another!

Eric Greenwell uses Scotch tape to join bracing wire to the bracing tensioner weight - quick and easy!





KLINT WORTH'S 2-PIECE ADJUSTABLE BOOM

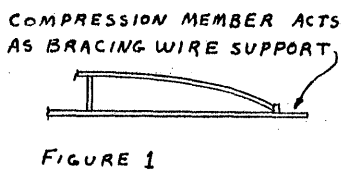


FIGURE 1

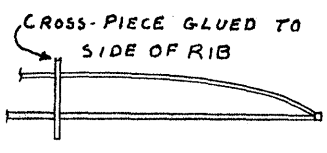


FIGURE 2

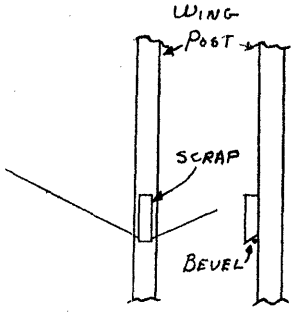


FIGURE 3

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." APRIL 1963

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New members who joined in March:

RONALD GANSER, 2500 Mission Street, Pittsburgh 3, Pa.
HARRY LEHRMAN, 524 Cross Street, Malden 48, Mass.
V. F. PLACHY, 8227 Cedar Avenue, Cleveland 3, Ohio

Contest Board Action

In balloting during March, the Free Flight Contest Board officially rejected the Solid Stick Proposal. The proposal was in a second study period necessitated by a premature vote by an earlier Contest Board. This action finishes the proposal beyond recall.

A second proposal on the same ballot received sufficient votes to send it into the study period as called for in the Rules Revision Guide. The proposal, to add FAI Indoor Models to the AMA list of indoor model categories, was submitted to the Contest Board in its entirety, complete with the FAI Indoor rules currently in use, rather than in the abbreviated form used on the NIMAS Ballot.

NIMAS BALLOTS!

For those who have not yet returned their ballots, we will not accept those mailed after April 15. A full report of the return will be made next month.

SPONSORED JUNIOR MEMBERSHIPS

This fund increased by $2, for a total of $24 or 12 "vacancies" to be filled by nominations. At present we have two "loners" (fliers who are not affiliated with a club) under consideration, and perhaps we will reach a decision by next month.

OOPS!! (AGAIN!)

Last month's article had a few more goofs than we really needed, but the only one that mattered occurred in Richard Miller's exciting tale. Just below the picture of the gliders on page 3 the word "not" appears. It should not - and we have agreed to 30 lashes with a wet noodle, providing someone can hold on to a wet noodle that long.

FAI INDOOR REPORT

Chairman Kowalski Reports

The following items have been acted upon by the FAI Indoor Committee: Due to the large number of indoor fliers on the West Coast, the number of qualifiers for the Western Zone Semi-Final has been changed to the top 80% of the entrants at each Quarter Final held there. Qualifiers for the Nats Semi-Flyoff from the Dallas Semi-Finals will be allowed on the ratio of one qualifier for each six entrants, up to but not exceeding three people.

Nats Semi-Flyoff

The Nats Semi-Flyoff will be flown in the Hangar at Santa Ana NAS on either August 1-2 or August 2-3. Bruce Paton will be organizer and contest director and will make the final decision on contest procedures. However, there is a majority in favor of not using rounds, rather to fly three flights on the first day and three flights on the second day and to allow unlimited test flying. Transportation is available for three East Coast qualifiers and three Central Zone qualifiers with pick-up points at Washington, D. C., New York City, and Chicago Illinois. A plan is being formed to raise funds for at least one South Central zone qualifier's transportation, but no word is available now. Further details will be forwarded to those eligible for transportation as they are selected.

An Appeal For Support

During the program last year it was noticed that some fine indoor fliers did not get around to entering any of the elims held. Since the success of F.A.I. Indoor and especially the future of our team depends so much upon the backing of all modelers, we urge you to plan to enter and support any and all FAI meetings held in your area whether you plan to try to make the team or not. Our team consists of only three fliers and a manager, but the hopes and ambitions they carry with them on the trip abroad coincide with our own. This is something they can not win in competition; but we can give it to them with a minimum of effort by proving that indoor fliers are a "stick together bunch". So let's all get out and FLY FAI.

Local Elims Schedule

WILMINGTON, CALIFORNIA - April 12, 1963
Andy Faykun, 9410 Dayton Way, Beverly Hills, Calif.
SANTA ANA, CALIFORNIA - April 14, 1963
Bruce Paton, 1010 N. Mirasol St., Santa Ana, Calif.
CHICAGO, ILLINOIS - April 20, 1963
Pete Sotich, 3851 West 62nd Pl., Chicago, Illinois
LAKEHURST NAS, NEW JERSEY - April 21, 1963
C. V. Russo, 143 Willow Way, Clark, New Jersey
DETROIT, MICHIGAN - April 21, 1963
Paul Crowley, 16835 Lilac, Detroit 21, Michigan
LANGLEY FIELD, VIRGINIA - April 23, 1963
Bob Champine, 25 Beechwood Dr., Yorktown, Virginia

Quarter-Final Schedule

DALLAS, TEXAS - April 20, 1963
W. A. Burt, 2334 Mockingbird Lane, Garland, Texas
SANTA ANA, CALIFORNIA - May 5, 1963
Bruce Paton, 1010 N. Mirasol St., Santa Ana, Calif.
DETROIT, MICHIGAN - May 12, 1963
Paul Crowley, 16835 Lilac, Detroit 21, Michigan
CHICAGO, ILLINOIS - May 18, 1963
Pete Sotich, 3851 West 62nd Pl., Chicago, Illinois
LAKEHURST NAS, NEW JERSEY - May 19, 1963
C. V. Russo, 143 Willow Way, Clark, New Jersey

Results From Local Elims

DALLAS, TEXAS - March 17, 1963 (Ceiling height 42')
Nine entrants and five qualifiers

				Total
1.	Stan Chilton	7:27.2	12:11.8	19:49.0
2.	Bud Tenny	7:35.2	11:48.5	19:23.7
3.	Jim Clem	7:04.2	8:22.8	15:27.0
4.	Don Chancey	8:08.5	6:56.0	15:04.5
5.	Mike Fedor	7:13.6	6:29.6	13:43.2

MOFFET FIELD, CALIFORNIA - March 24, 1963
Nine entrants and five qualifiers

				Total
1.	Carl Redlin	37:35	37:07	74:42
2.	Carl Rambo	33:35	33:28	67:03
3.	Manny Andrade	34:17	31:59	66:16
4.	Bud Romak	34:17	?	?
5.	Joe Bilgri	?	?	?

INDOOR FLYING SCALE

INDOOR NEWS AND VIEWS has not voluntarily shunned the scale fliers - but rather none of them would help by sending information. However, we now have some information on hand and we're on the trail of more. Here are the rules used by the Wilmington Indoor Model Airplane Club, the first all-indoor club ever formed:

1. Any aircraft may be modeled from kit or plans.
2. Maximum wing span is 24". Wings must be covered on both sides.
3. Prop diameter shall not be greater than 35% of wing span.
4. Builder must supply proof of scale to be awarded scale points.
5. Two Model Groups will be recognized: Monoplanes and Biplanes.
6. Models must R. O. G.
7. Unlimited attempts to obtain four official flights.
8. Time starts when the model is released and is official if the model becomes airborne for five seconds or more.
9. Time stops when the model touches down, or when the flight ends due to a collision with a fixed object. If a model bounces and still continues its flight while above the floor the timing continues until the flight ends.

CALLING ALL PHOTOGRAPHERS!

As many of you may have seen, the February issue of Model Airplane News had a color photo of indoor models as the cover. Here is the story behind that cover:

THE M.A.N. COLOR COVER

by SID BERNSTEIN

As an indoor enthusiast and professional photographer I have always been amazed and awed at the fantastic color patterns refracted by microfilm. I was equally amazed by the fact that I had never seen a good color photo of these elusive colors. So when word was received that Walt Schroder had plans for a gala Indoor issue I felt this was an exceptional opportunity to plan a still-life layout and record some of the beauties of indoor mike ships.

Instinctively, after many years of advertising illustration experience, I started to plan layouts and collect props for a still-life illustration for the M.A.N. cover. I chose to do a still-life because of the controlled lighting needed to capture the colors refracted by microfilm. Trying to shoot a mike job in flight and still get suitable color would be impractical. It would require multiple flash light sources and many sheets or rolls of expensive color film to get both the color refraction as well as the action and composition.

In a still-life set-up you can show the subject clearly and control the lighting to an ultimate degree. I dug up a tissue "B" stick, recovered a baby R.O.G. and "B" stick, and repaired an old glider I had. To add some interest to the photo I put a flashy red ribbon on my stop watch and some yellow clay on the nose of the glider. This boosted the price for props to a total of 29¢!

The real problems came after I had set up a roll of blue seamless paper as my background, set up the models and started to light the photo. In order to pick up the color, six photofloods were placed in various positions. The placement was so critical that movement of a light several inches one direction or another would cause loss of color from the film. Another problem arose when the heat from the photofloods made the models flutter. This was solved by bracing the mike ships in every conceivable manner - such as drops of glue on prop shafts to prevent prop movement and composing the picture so the models touched each other and supported themselves.

The question that might arise now is if I had so much movement problem why not use flash. In order to work at the small lens aperture needed to give proper depth of field, a tremendous output of flash would be needed. Also the danger of popping flash bulbs and the heat they give might damage the delicate mike ships. Cooler strobe lights could have been used, but the cost for a 6 or 8 unit multiple strobe outfit is formidable.

So, the practical solution was photoflood lighting regardless of the problem of battening down all the models to prevent movement.

Finally the moment of truth arrived. All the models were steady and I was ready to make the final exposures. I say "exposures" since I used what is known as bracketting. This is a technique of making an exposure at the meter reading and then making several other exposures both longer and shorter than the "normal time." This is done to cover any possible exposure miscalculations and also to yield a wide variety of transparencies from light overexposure to dark richer underexposure. For the technically minded here is the technical data:

Camera - 5 x 7 Karona view with 4 x 5 reducing back.

Lens - 180 mm Zeiss Tessar lens.

Film - 4 x 5 Eastman EKTacrome, Tungsten balanced film (3200° Kelvin)

Exposure - Basic exposure 3 seconds at F .45

Lighting - Photoflood diffused plus a row of 3200° K. #1 and #2 photofloods.

LOW CEILING FORUM

Have you performed a series of experiments aimed at improving performance in low ceiling sites? Here is the place to report the success or failure of those experiments, for the benefit of low ceiling fliers everywhere. It is important to record the experiments that fail, since what wouldn't work in some situations might work at other times, or with different methods of application. Try to keep track of and relate as many different factors as you can - until we find out more about the business we won't know what isn't important!

The emphasis will be on those low, LOW ceiling sites - since this is the most common site available and since there seems to be a larger number of problems which ' r-mingle in their effect.

This month, Lee Hines, designer of the Sweepette, has the floor. The Sweepette series was developed in two low ceiling sites - the 20' Inglewood Recreation Center and the 29' 11' Wilmington Recreation Center, so Lee's remarks should be quite pertinent to our purpose.

LOW CEILING GLIDER TIPS

by LEE HINES

I feel that picking the wood for Cat. I gliders is the most critical single factor. This is important for weight vs. strength considerations and for control of warps. It seems that warps have more effect in Cat. I, and the flier must constantly watch for changing humidity. A change in humidity will cause warps to appear or old ones to change.

While flying, watch closely what other gliders are doing in different sections of the building. Vents, fans, or just plain holes in the wall may cause "jet streams". Be very careful of small cracks and splits in the glider, since the time will drop even if the glider doesn't fly apart on the next launch!

The desired launch for optimum performance is as follows: 1. Know your launching spot! 2. Generally, a step or two is taken to add kinetic energy to the launch. 3. With the glider held in a left bank (experiment here, it differs from glider to glider), pitch the glider with a straight movement of the arm and a forward snap of the wrist. (A twist will shatter the fuselage or wing if the glider is competitive.)

Here are some observations on low ceiling glider design principles: Slightly more incidence (angular difference) is needed as the ceiling shrinks, slightly larger stabs are needed as the ceiling shrinks, and Sweepette type gliders climb higher for a given weight and glid ratio and will roll out better than straight-wing gli . Also, higher efficiency is indicated by the fact that the stab size is smaller than on normal gliders and it flies that way.

Wings for Cat. I gliders are the toughest to build. I generally make a light cut exactly on the high point after breathing on the top surface and bending to form undercamber. Be careful not to form washin in either wing. Squeeze thin non-shrinking glue into the cut, allow it to dry and sand it smooth. The cut should have imparted more undercamber and also made a slight ridge on the top. I used this to good advantage on the Sweepette 16 Mk. III. (This glider holds the Cat. I Open record of 0:37.0 - Ed.)

Progress in performance seems to have slowed considerably, but I feel some help may come from going to a 17" wing span and carefully calculating new wood sizes and weights. This ought to improve stability and aid the glide somewhat. One further comment - tip washout was a must on all Sweepettes.

RECORDS? MAYBE!

CHICAGO AERONUTS INDOOR RECORD TRIALS, March 30, 1963

CAT. II, Madison St. Armory, Chicago, 75' ceiling
- Senior A R.O.G. - 9:01.2, Dave Erbach
- Senior B Paper - 13:20.8, Dennis Kargol
- Senior B Stick - 12:17.5, Dave Erbach
- Senior Helicopter - 5:15.0, Dave Erbach
- Senior Ornithopter - 1:01.0, Dave Erbach
- Open B Paper - 17:41.8, Walter Mumper

CAT. I, Lecture Room, Madison St. Armory, 22' ceiling
- Senior Helicopter - 5:17.0, Dave Erbach
- Senior Ornithopter - 0:46.3, Dave Erbach

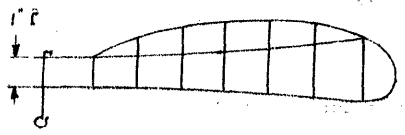
PROP FORUM

Many times when information about a contest winnin model is presented, details about the prop are often glossed over or just plain neglected. As a result, prop information is scarce and poorly defined. We hope to correct this lack by presenting prop designs, tested or speculative, test results, gadgets, and other such information as it is made available. We invite contributions and discussion of this vital subject, seeking to advance the state of the art as far as possible.

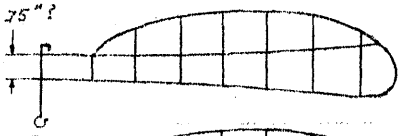
Two-Spar Props

In the past, it has often been the practice to drive two-spar props from the rear spar so that the prop will flare to a greater degree than if it were driven from the front spar. Jim Skinner suggests that three versions of the same basic prop may be advantageous in adapting a given model to different sites. All three props sketched below are the same pitch and diameter and are built on the same form. The only difference in blade area arises from the change in shape near the hub due to a different location of the front spar - all the ribs are identical from prop to prop and the outline pieces are identical in length.

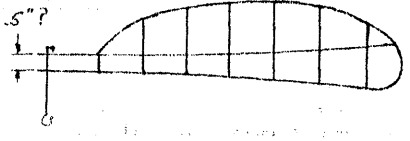
Note in the sketch below that each prop is driven from the front spar and the prop shaft is loose in the rear spar. As the sketch shows, moving the front spar changes the blade area location to control the blade flare in a manner similar to off-setting the spar in mono-spar props.



FAST CLIMB
(more blade area behind front spar)



MEDIUM CLIMB
(same area each side of front spar)



SLOW CLIMB
(More area ahead of front spar - lots of flare)

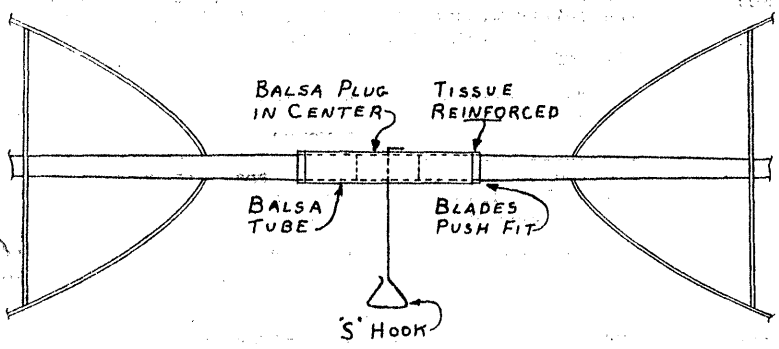
Prop shaft attached to front spar and loose in rear spar so that most of the power is applied to the front spar.

Adjustable Pitch Props

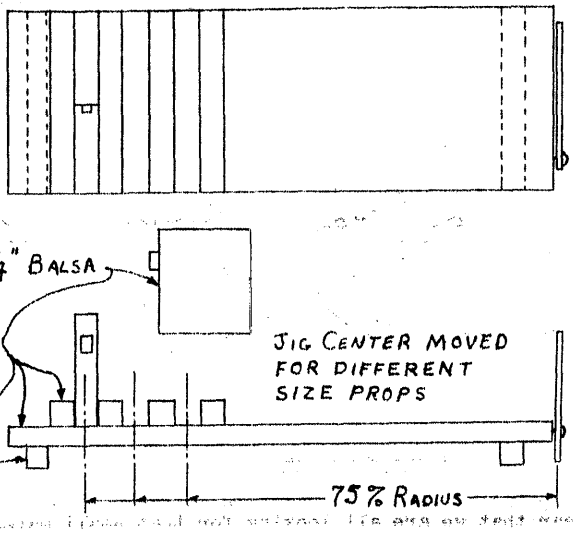
Arthur Barr reported that several British fliers have been experimenting with adjustable pitch props in an effort to get a closer match of prop-and-motor to the model. The basic prop construction is sketched below, and the only major difference in construction is that the hub is now a hollow tube into which the blades are a snug fit. The blades are built on a form corresponding to the highest pitch desired from that particular prop; the prop is assembled and adjusted with the aid of the adjustment jig shown below.

Completely aside from the fact that the props can be adjusted to varying conditions on the field, this arrangement has the advantage of permitting permanent attachment of the hub in situations like nose plugs of cabin models, the individual blades are easier to build, cover, and repair than one-piece props, and such props can be packed and stored more conveniently than other types.

One consideration that may prove to be on the negative side is the fact that adjustable pitch props conform to the so-called "true pitch" only at the design (maximum) pitch. As the pitch is made lower, the blade area nearer the hub is at an angle much lower than a conventional prop would be. Since this is a deliberate design feature of some props now being tried, only time will tell if this feature is a drawback or not.



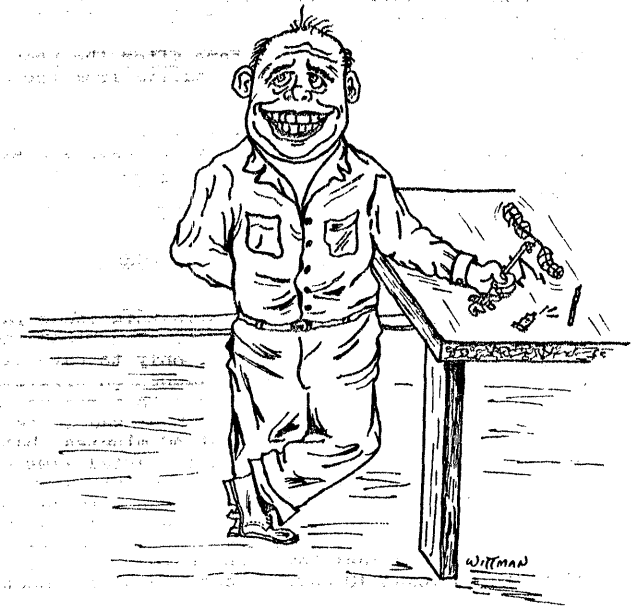
ADJUSTABLE PITCH PROP



PITCH ADJUSTMENT JIG

THE PERILS OF CHARLIE

Ron Wittman is finding out that there can be a few draw-backs to trying to build indoor models while in the armed services. Here is one such hazard:

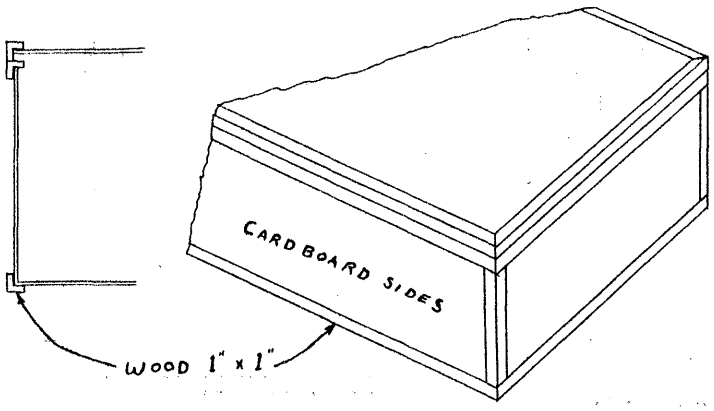


HEY CHARLIE! YOU EVER SEEN AN INDOOR MODEL?

HINTS AND KINKS

Model Boxes

The problem of storing and transporting indoor models is always with us, and here is another solution to that problem. Clarence Mather says: "I have built several cardboard-wood boxes and learned some things the hard way. Large pieces of good quality cardboard can be cut from refrigerator cartons that appliance stores are happy to donate. Wooden edging adds much to the box's performance of shape and dimensions. The sketches show the general construction. The wood angles can be cut from 1" x 1" stock on a bench saw or by the lumber yard for a modest fee. The angles should be left about 3/8" thick. I found that smaller wood sizes were likely to warp. The cardboard is glued along all joints and tacked in place. Such a box 9" x 19" x 37" holds two FAI jobs, weighs 3 or 4 pounds and costs a couple of dollars at the most (having the wood cut at a lumber yard)."



RE-INFORCED MODEL BOX

Hints From Lew Gitlow

"Competition in Indoor has been so keen during the last year that we are all looking for that small margin of something extra. Here are a few tips that will add to consistency and efficiency:

1. A thrust bearing or rear hook that breaks loose in a contest can eliminate a model that has been trimmed out and ready for the all out effort. A few wraps of tungsten wire touched over lightly with cement is insurance that costs little in weight.

2. While covering props I apply saliva to all the ribs as well as the outline to insure true sections throughout the span of the prop. If the film does not stick to a rib the film is made to adhere after the prop is covered by using a fine brush and saliva from the underside of the prop.

3. Torque meter tests show that if a motor is stretched out a few inches the torque will be increased by as much as 15%. I intend to go back to designs with long motor tubes for all competition."

NEWS FROM AROUND THE WORLD

CALIFORNIA - MOFFET ELIMS

The results shown elsewhere in this issue fail to tell the whole story of this meet. Tom Finch made a 37 minute test flight with his FAI, only to have it blow up in his hands as he prepared to launch an official flight.

The magic 40 minute mark was almost reached during the day by Frank Cummings. His model had to be ballooned out of the "jet stream" at about 30 minutes. but the watch was left running out of curiosity. Total time - 40:13.2!

Joe Bilgri has announced that Moffet Hangar #1 will probably be available until September. In addition to the elims already scheduled, Joe is scheduling Record Trials each month until September. If you plan to enter these meets, Joe must have your name, address, and place of birth at least 10 days in advance of the meet.

CALIFORNIA - SANTA ANA

The Sky Hoppers of Orange County are now flying Cat. I from 7 PM to 10:30 PM on the third Monday of each month. The site, the Santa Ana Boy's Club, has a 20' ceiling. Contact Bruce Paton, 1010 N. Mirasol St. in Santa Ana for more info.

COLORADO - DENVER

The Martin Model Masters have just closed out their indoor season, finishing with a contest on March 17. Their top times: Stick - 11:45.5, Hal Blubaugh; Paper - 6:57.2, Shaye Diebolt; IHLG - 0:32.4, Bob Lynch.

ENGLAND - COVENTRY

Very little flying has been done in England, and the long and cold winter has been used to design, plan, and make those little "extra" gadgets we all wish we had.

The English Indoor Committee, elected during the FAI Indoor Championships last year, is working on new rules and looking for various sites all over the country. They are hoping to utilize smaller halls that will be available more often, so that more fliers will have a chance to develop.

ILLINOIS - CHICAGO

Pete Sotich, encouraged by the fine turnout for the December Record Trials, scheduled more record trials in addition to the FAI Elims already set up in the Madison Street Armory. One record trials was held March 30, and another is set for April 27. The Aeronuts and the other Chicago area fliers really "get with it" at record trials and contests, as a look at the record will show.

INDIANA - KOKOMO

Extremely bad weather forced cancellation of the challenge meet between the Kokomo Aero Team (their ne name) and the Chicago Aeronuts. However, a few hardy Aeronuts went anyway and they held an impromptu meet. Perhaps it is just as well - the Bunker Hill site has been closed for remodeling, cancelling the March meet and maybe the April one. Check with Chuck Borneman, 1401 West Taylor, Kokomo, Indiana for latest info.

MICHIGAN - DETROIT

With the three elims coming up soon, FAI practice flying is picking up in Detroit. Phil Klintworth reports the following times: Klintworth - 24 min. and 26 min.; Kowalski - 26 minutes; Paul Crowley - 24 minutes.

MISSOURI - ST. LOUIS

Indoor fliers in St. Louis finally located a school gym and hope to keep using it. A misunderstood heating system created unusual drift problems the first time out, but they know what was wrong now. Next time the times will be longer and more people will be ready.

NEW JERSEY - LAKEHURST

Fine work by C. V. Russo has resulted in eleven dates scheduled with the Navy in Lakehurst, the three elims listed in FAI Indoor News plus eight record trials. The RT dates are: April 7, May 5, June 2, July 14, August 11, August 25, September 8, and October 6. Perhaps if the demand is great enough the Navy will permit a winter schedule also. Russ had long felt that more flying time was needed for faster advancement, and this schedule will make it possible.

NEW ZEALAND - AUCKLAND

Jack Eriksen reports that it was proposed to modify the existing N. Z. indoor rules so that there will be two classes of tissue models and two classes for mike. The proposed classes are to be over 18" span and under 18". Simplified rules such as these will surely help the sport to grow, and these sizes will make good use of existing sites.

OHIO - AKRON

Indoor activity in Akron is a little slow due to lack of sites, but Bill Hulbert has been setting up some dates in the 40' Akron Armory. Contact Bill at 174 Castle Blvd., Akron 13, Ohio for info on flying sessions.

TEXAS - DALLAS

The FAI local elims were held in the very cluttered 42' ceiling Drill Hall at Dallas NAS. Stan Chilton came down from Wichita and Mark Valerius brought some fellows from Shreveport, which made Dallas fliers hopeful for future inter-city contests. Since the former building record was only 9:25, the two top times of 12:11.8 and 11:48.5 represent a fair advance.

VIRGINIA - LANGLEY FIELD

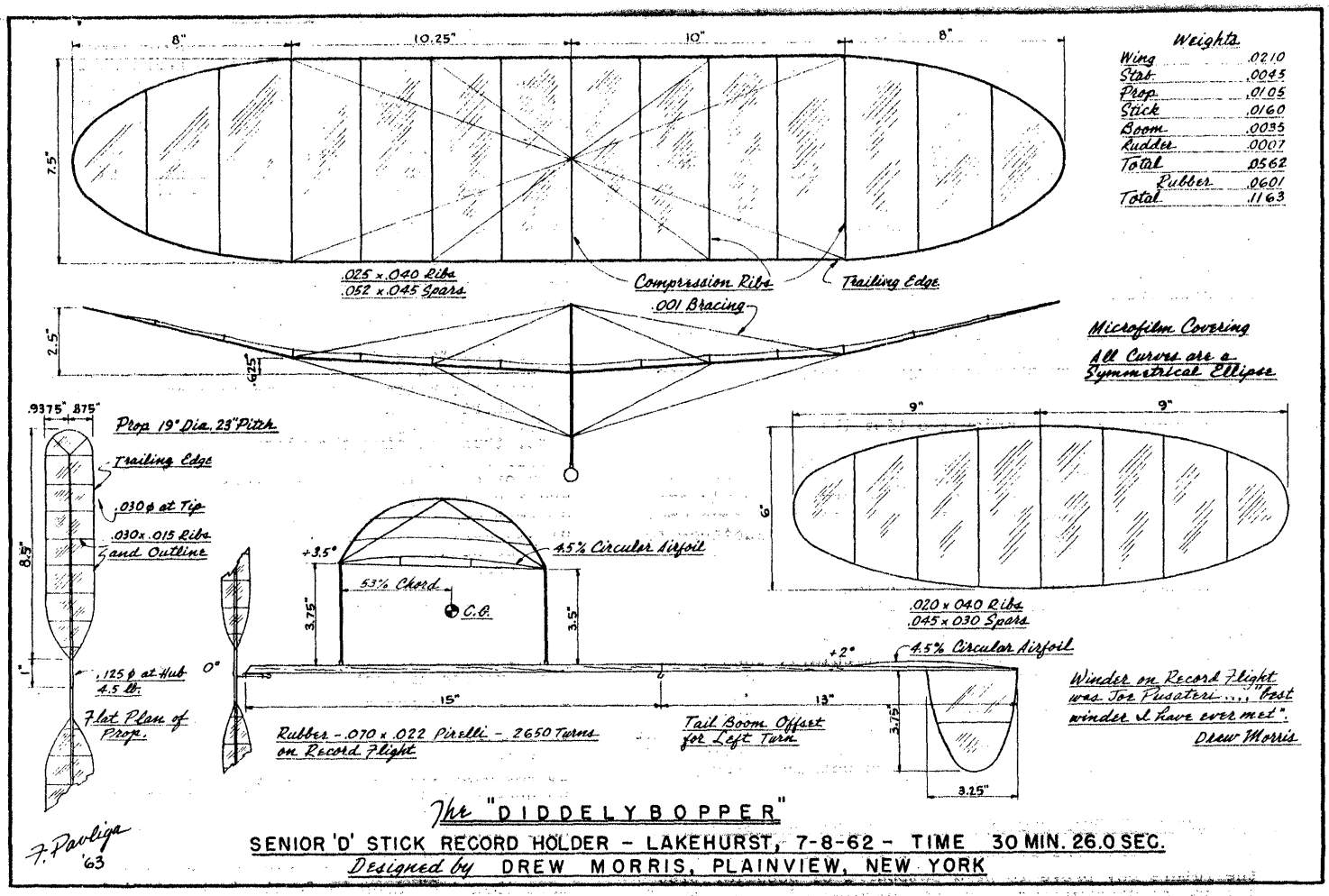
The first record trials for the Langley group showed some pretty fair times, but drift from a big window which was jammed open almost created a microfilm outdoor class! Record attempts were made by Bob Champine and three junior Champines - quite a formidible group! The next record trials will be held on April 12. Contact Bob Champine, 25 Beechwood Drive, Yorktown, Virginia for more details.

STATE OF THE ART

The model featured this month is designed by Drew Morris, and with it he became the first senior to join the Thirty Minute Club. Incidentally, the same flight smashed the long-standing Senior D Stick record formerly held by Ray Harlan.

The series of flights which resulted in this new mark is described by Drew: "The first flight, made on a 19" loop of .075 rubber, was wound to 2000 turns by Joe Putateri. After holding the burst, the model still started to bounce off the rafters. It must have hit 20 times, but didn't hang. After a tense 16 minutes it started down and dead-sticked half-way down for 25:13.

We then used a 21" loop of .070. Succeeding fl were 27:29 on 2200 turns, 28:06 on 2400 turns, 30:26 2650 and 27:15 on 2800 turns. Needless to say that by the time we got 2800 turns into the rubber there wasn't much left of it. When we re-measured the rubber it had stretched 4"! Under the right conditions I can probably get another few minutes from this model."



THE HAND LAUNCHED GLIDER

PART 13 by RICHARD MILLER

REBUTTAL TO THE REBUTTAL

Dear Lee:

Part 13 of the HLG series was prepared and forwarded to Bud some time before your "Word of Rebuttal" arrived. Insomuch as it contains some answers to your questions I will not repeat them here.

Let me begin by saying that I never assumed that a successful two-position stabilizer via flexible boom would be an easy thing to achieve. Despite the fact that my initial experiments (on two gliders) succeeded beyond what I had hoped to achieve in the early stages of trial and error I am still convinced that the problem is not easy.

Let me next add that none of the three gliders I have seen fly with purposely flexible booms (one of Pete Nishanian's and the two of mine) have encountered flutter or the other problems which you mention. Thus it is possible to get what you want in the way of controlled flexibility.

Perhaps you stopped experimenting a little too soon. Some day I hope to prepare a learned paper showing that every development of substance in the History of Civilization from the wheel to the corn plaster was subject to Failure on the First Attempt. I have grown to accept FFA, or FOFA, as a way of life. That's why I was so suspicious when my first flexible-boom HLG worked as well as it did.

Finally I do recall the very fine times you have done with the latest Sweepette. Reading them does not bore me. You are altogether too close. Otherwise why would I be fooling around with anything so illogical, impractical and controversial as a flexible boom?

Richard

DESIGN (concluded)

At the end of last month's installment you were promised an Exhortation. However times are good and Exhortations never were so dear that we couldn't afford to dispatch a whole volley as readily as one. So gird up thy loins. You were also promised a Design Resume and you will, accordingly, find it conveniently spread throughout the Exhortations, most singularly in the first.

Exhortation #1 Don't believe anything you've read about design - in this series or elsewhere. Don't believe it, that is, unless your experience has proven it to be true. In other words, remain a skeptic. Don't take other people's word for what 'Z' will equal if 'A' is added to 'B' and divided by 'C'. Prove it to yourself.

Why did I go to all the trouble to write several thousand words about design then? It was a desire, first of all, to set out in some order the results of my own experience. I much prefer to think, however, that rather than providing the final word on the matter I am submitting a guide against which the reader can compare his own experience, a sort of sounding board from which he can hear the echo of his own conclusions. Therefore, don't make design theory by me or anyone else responsible for how your models fly. You are the responsible one.

Exhortation #2 Experiment! Careful study of all the articles ever written on rudder theory is worth less than one session in the park with an old glider, some spare balsa and a razor blade. An hour spent like this can provide more insight into what happens when a surface is modified (if not why) than all the hours of burning midnight oil combined.

There seems to be a deeply-ingrained idea among model builders, and a very unfortunate one - that once all the components are glued in place and the glider (or whatever) is performing in a more or less satisfactory manner that nothing further in the way of design should be done. They tend to look upon finished machines the way many citizens do on the Constitution - as something not to be

meddled with. By this thinking one process stops at the workbench and another starts on the flying field. Actually this need not, and should not be the case. The processes should overlap. The construction tools should go along to the flying field. Design, construction and adjustment are all interrelated to a very high degree: Adjustment can be designed in as readily as a design can be adjusted; modifications in the structure of the glider during test flying - as we shall shortly see - can be a bigger help than the traditional adjustments.

So use old gliders to design new ones. A model is a much better test bed for new ideas than the drawing board. Cut, add to, hack, change, realign - never stop designing the model until it won't fly any more. Then still continue to design it in its descendent which, hopefully, embodies the design lessons it taught.

In just a moment a partial list of possible experiments which you can subject one of those no-longer-new gliders to when you have the urge. First, another Exhortation.

Exhortation #3 Abandon the idea that a glider must be uniform or symmetrical. The general look of a HLG is of something that should be the same on both sides. Furthermore it flies, flight is graceful, and there is all but irresistible tendency on the part of keenly symmetrical minds to associate gracefulness with structural harmony and uniformity, and a concommitant reluctance to skew, imbalance or otherwise create disproportion.

These pernicious pitfalls in human nature, nevertheless, must be resisted with a stout heart. Full scale airplanes (with pilots to make them go left or right at will) are not symmetrical. Not even birds are. So why should a hand launch glider be, particularly when it's designed to do an unsymmetrical thing, or at least a symmetrical thing in an unsymmetrical manner? We already know, for example, that our asymmetrical hand necessitates a finger grip on one side or another, that stab tilt can be a big help in trimming a model and that weighting one wing tip can mean the difference between so-so performance and an outstanding flight.

These are only some of the functional irregularities that have been discovered to date. Others may be lurking where you least expect them. The top scoring machine of the future may prove to be a potpourri of peculiarities devised of dissimiliarities and composed of a complex of curious quirks. Of course it may not be too, but you never know until you try.

Suggestions For Experimentation

Wing

Make 4 panels from 2, 6 from 4 or 8 from 6. Clip one tip and see what happens; then find what must be done to offset the results - like adding weight, tilting the stab or changing dihedral angles. Add weight to the other tip. Change existing -hedral angles. Skew the wing. Add turbulators.

Stabilizer

Shorten one side of the stab. Cut off one side and reglue it so as to get dihedral, anhedral or tilt. Try reverse tilt. Trim stab size down until the model will no longer fly, watching what happens to the C.G. and stall recovery. Add a turbulator to the stab.

Rudder

By all means one of the most fertile areas for experimentation - and one of the easiest to work in. Rudders are almost invariably larger than they need be - not to mention too large. Trim down the rudder size bit by bit until the model becomes unflyable. Glue a top rudder on the bottom, a bottom rudder on top. Move the rudder forward, rearward. Offset it to one side. Don't just stand there. Do something!

Fuselage

In the case of the fuselage I would like to relate a specific example partly because it bears on last month's discussion about a two-position stab, partly because it illustrates what a little creative experimentation can produce, and partly because the results were so dramatic.

One evening recently, finally determined to find out more than I knew about fuselage flexibility, I went out to the local flying field with a beat up, second string 'Omega', a razor plane and a block of coarse sandpaper. At the outset the glider launched in a more or less normal manner except that a shade too much negative incidence in the stabilizer (a long time fault of the glider which became a virtue for this experiment) made it loop slightly over the top. My intention was to slim down the boom until this characteristic disappeared.

I took three good shaves off the bottom of the boom before I began to get any action and continued after that to sand the bottom with heavy sandpaper between flights. Very shortly things began to happen. For one thing, as the boom got lighter it was possible to take clay off the nose, thus reducing the weight of the glider. But the payoff was in the launch. When I got into the critical area of boom size the trajectory began to straighten out and the glider, naturally, spent more of its time going up vertically and got higher. At the same time launch circle kept getting smaller until it was down to about 225° or about 5/8 of a circle. Finally the still air time crept slowly up till I was getting a good ten seconds over what I had come to expect of this particular glider even at its best trim!

I was very impressed when I had finished. I had been pretty well aware for some time that there was a more or less precise dimension for the other components of the glider, and I had been building what I had considered to be decent fuselages. But it had never occurred to me that there might be a precise dimension for the boom as well as for, let's say, the thickness of the stabilizer. It was also obvious that to get that dimension it would be necessary to trim the fuselage under actual flight conditions - whether you want 'lay down' in the stab or not. Finally I was struck by the fact that,although I had begun with what I considered a thin fuselage, the boom I finished with was ridiculously thin, being a l[illegible]e more than 1/8" deep in front of the stabilizer. Yet all of that it was probably stronger in its lightened state than it had been before.

The feel of the fuselage boom indicated that the downward deflection might be easy to measure, and it was. With the fuselage securely clamped and supported as far back as the wing t.e. a weight of one ounce, suspended from the boom immediately in front of the stabilizer, caused a total droop (measured at the t.e. of the stab) of 5/16"! Needless to say this figure can only be interpreted in light of the tail gap, which in this case was 10", the stabilizer area (about 13 sq. in.) and the fact that the fuselage was made of hard (20 lb./cu.ft.) and resilient balsa. In any event it gives a figure for comparison and a rough guide to work from.

Exhortation #4 Enjoy yourself! From some of the foregoing it might sound a little too much like Deep Endsville. It was really just fun.

INDOOR NEWS AND VIEW

BUD TENNY "Voice of N.I.M.A.S."

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

NIMAS members who joined in April:

PAUL CROWLEY, 16835 Lilac, Detroit 21, Michigan
BRUCE FOXWORTHY, 11 Marion Road, Montvale, New Jersey
JUSTIN MURRAY, 4287 Lakeville Road, Petaluma, California
ED STOLL, 7319 Marjorie, Detroit, Michigan

P. D. CURTIS, 15 Titania Way, Meadowridge, Heathfield, Cape, South Africa

Sponsored Junior Memberships

Since the last report, the SJM fund has grown by two full memberships, bringing the total to $28 which covers 14 sponsored memberships.

So far we have received four nominations (two since the last report) and one nominee has accepted. Bruce Foxworthy (listed above) is the first sponsored member, and was nominated by Sid Bernstein and Richard Miller.

Bruce is 14 years old and has been building models since he was six, but, to quote Bruce, "Until I was 9, they all failed to fly." His first indoor model was an original, covered with Jap tissue, which flew for 30 seconds in his living room and for 1:15 in the Rockland gym in Orangeburg. The model was inspired by the experience of attending one of the sessions held by Sid Bernstein a few weeks before.

In spite of this experience, Bruce had never seen any microfilm - and had only heard about it. When he was doping a glider one day, he accidentally dropped some dope in a nearby pan of water. After examining the colorful result for a while, he decided this must be microfilm, and confirmed it with a call to Richard Miller. He then managed to lift a 24" hoop of film and cover an indoor model, all without instruction!

Contest Board Action

Early last month Chairman Phil Klintworth sent a memo to the Free Flight Contest Board which detailed four IHLG proposals (the same four as on the NIMAS Ballot, including Question VI, Hatschek's Alternate Proposal). He asked that the members be ready to rate the proposals in order of preference on a ballot to be called about May 1, 1963. The results of this poll will determine which one of the proposals will go into the study period.

On the same memo (and to be voted on at the same time) was Question II (on NIMAS Ballot), the Detroit-Wilmington-Chicago proposal to change HLG scoring to be the total of the best three of nine flights. Acceptance of this proposal will place it in the required study period before it will be finally accepted or rejected.

PFFT!!

A middle aged modeler all thumbs
Taking microfilm just as it comes
Decided one night
To shrink it up tight
Had a swoosh and a pile of charred crumbs.

HB

N.I.M.A.S. BALLOT REPORT

A total of 56 ballots were returned, just slightly less than 50% of those eligible to vote at the time the ballot was issued. That seems to be about par for an American non-presidential election! The results stack up as follows:

	For	Against	No Vote
I. Detroit-Wilmington-Chicago HLG proposal	32	11	12
II. Detroit-Wilmington-Chicago HLG Scoring proposal	36	16	3
III. Detroit-Wilmington-Chicago "Add FAI" proposal	44	5	6
IV. Cliff Model Club HLG proposal	2	28	25
V. Skyscrapers HLG proposal			
VI. Hatschek's alternate proposal			1
VII. Solid Stick proposal			
VIII. Survey - unlimited "D"			1

The Free Flight contest board h
the Paper Stick proposal and passed
period - at least we know that thes
the approval of NIMAS members. Als
that it would be fruitless to initi
the wing area limit on Class D. On
several members failed to read the
and voted for more than one of the
posals, and in one case a vote was
proposals. These cases account for
counts registered above.

FAI INDOOR REPORT

Quarter-Final Schedu

SANTA ANA, CALIFORNIA - May 5, 1963
Bruce Paton, 1010 N. Mirasol St
DETROIT, MICHIGAN - May 12, 1963
Paul Crowley, 16835 Lilac, Detr
CHICAGO, ILLINOIS - May 18, 1963
Pete Sotich, 3851 West 62nd Pl.
LAKEHURST NAS, NEW JERSEY - May 19,
C. V. Russo, 143 Willow Way, Cl

Semi-Final Schedule

EAST COAST SEMI-FINALS - June 2, 196
Lakehurst NAS, New Jersey
C. V. Russo, 143 Willow Way, Cla

CENTRAL ZONE NORTHERN SEMI-FINALS -
Paul Crowley, 16835 Lilac, Detro

CENTRAL ZONE SOUTHERN SEMI-FINALS -
SMU Coliseum, Southern Methodist
Jim Clem, Box 75, Addison, Texas

WEST COAST SEMI-FINALS - June 2, 196
Santa Ana M.C.A.F. Hangar, Santa
Bruce Paton, 1010 N. Mirasol St.

*Note change of date and change of C

Results From Local El

WILMINGTON, CALIFORNIA - April 12, 1
Seven entries and four qualifier

Tom Finch	13:03	12:0
Bruce Paton	11:03	8:0
Warren Williams	9:19	9:3
Sheridan Asklund	9:15	8:4

SANTA ANA, CALIFORNIA - April 14, 19
Six entries and three qualifiers

Bill Atwood	37:17	31:1
Frank Cummings	37:00	28:2
Lew Gitlow	31:27	28:0

CHICAGO, ILLINOIS - April 20, 1963 (
Nine entries and five qualifiers

Bob Kintzele	25:28	23:5
Bob DeBatty	24:05	24:2
Charles Sotich	23:20	23:0
Curtis Janke	24:53	19:3
Dennis Kargol	17:41	21:1

LAKEHURST NAS, NEW JERSEY - April 21
Fourteen entries and seven quali

Bill Bigge	27:43	29:1
John Triolo	26:26	28:1
Ernie Kopecky	28:06	26:2
Edgar Franklin	26:59	24:0
Ray Harlan	27:26	23:1
Merrick Andrews	25:50	23:4
Ted Gonzoph	23:38	22:5

DETROIT, MICHIGAN - April 21, 1963 (65' ceiling?)
Eleven entries and six qualifiers

Paul Crowley	23:44	23:43	47:27
Dick Kowalski	25:09	20:12	45:21
Ed Stoll	23:20	18:39	41:59
Phil Klintworth	18:04	23:05	41:09
Clarence Mather	19:07	21:58	41:05
Hardy Brodersen	18:48	18:21	37:09

LANGLEY FIELD, VIRGINIA - April 23, 1963 (22' ceiling)
Three entries and two qualifiers

Bob Champine	7:58	9:23	17:21
R. Batterson	5:02	7:34	13:36

CLEVELAND, OHIO, April 27, 1963 (32'+ ceiling)
Fifteen entries and eight qualifiers

Lou Willis	31:14
Ronald Ganser	28:26
Larry Mzik	26:04
Joseph Hindes	25:27
Norman Getzlaff	25:00
William Hulbert	23:39
Frank Pavliga	21:57
Dave Nicol	20:16

Quarter-Finals Results

DALLAS, TEXAS - April 20, 1963 (56' ceiling)
Five entries and four qualifiers

Stan Chilton	14:59	16:09	31:08
Don Chancey	14:58	13:44	28:42
Bud Tenny	10:48	12:48	23:36
Mike Fedor	10:18	10:07	20:25

MOFFET FIELD, CALIFORNIA - April 21, 1963 (180' ceiling?)
Five entries and four qualifiers

Bud Romak	34:14	35:51	70:05
Lew Gitlow	32:37	34:07	66:44
Joe Bilgri	?	?	
Carl Rambo	?	?	

SANTA ANA, CALIFORNIA - May 5, 1963 (180' ceiling)
Six entries and five qualifiers

Carl Redlin	36:04	38:37	74:41
Bill Atwood	33:47	38:34	72:21
Frank Cummings	32:49	37:57	70:46
Tom Finch	30:28	36:21	66:49
Bruce Paton	30:04	31:07	61:11

****MODEL STEERING VIA BALLOON****

by BRUCE PATON

One phase of FAI indoor modeling that has been neglected is using a balloon to divert the path of a model as allowed under FAI rules. I am surprised at the number of good indoor modelers who fail to practice the diverting technique sufficiently to become adept at it.

More often than a few times the modeler waits too long while his model drifts toward girders or other obstructions; he then rushes madly around looking for a balloon to borrow. Often he finds that the foresighted guy who brought a balloon is using it himself. By the time he locates an unused balloon the model is already in the girders.

If he successfully locates a balloon he rushes madly to the spot immediately below the impending disaster, sends the balloon aloft and either:(1) disintegrates the model with a direct hit by the ascending balloon or (2) gets the balloon up in time for the line to hit the prop, and with one revolution securely attaches the line to the prop hub.

This avoids the girder collision but how does he get the model down unscathed? It's impossible to shake it loose, so he very slowly starts winding the line back on the fishing reel; slowly but surely the model descends to within reach. He usually has forgotten to set the drag on the reel; as he releases his hand from the reel handle to grab the model, the balloon starts up at about 30 MPH. If you have yet to see this occur, I think you can imagine what happens.

With considerable practice it is possible to start at the "impending disaster" side of the model's circle, miss hitting the prop, engage the line with the leading edge of the wing at the center, and carefully walk the model away from the girders. However, if the model is disengaged within ten seconds after original line contact as required under FAI rules, the resulting circle is not much better than it was initially. This procedure was learned in testing models to be flown under FAI rules and was used only to rescue up, the flight time ending with t the line.

The diverting technique is a than the above mentioned procedu easily become proficient at it. eral wings and wreck a few good is absolutely necessary for any

It is really quite simple and equipment: (1) A fishing pole wi enough to stay on the floor when foot diameter helium filled ball or other line (preferably white enough to reach the ceiling, and balloon large enough to take you

The actual technique is quite of contacting the outboard wing line so the model turns to the ri line, into a circle perfectly ce then releasing contact. The con degrees from "impending disaster" icult than threading a needle wi while standing ten paces from the

A few items noted here will balloon is at least 10' higher t the better). If you have bum de friend at some distance direct y the balloon up early. If in dou the balloon so the line just mis on the first circle and hold the (4)When the model circles around ance between the line and the mod (5)Immediately after the model p twice the distance judged toward circle. You now have the line w (it says here) of contacting the around.

It would be well to mention fishing pole. With a simple mat will be discovered that if a mod and your balloon is at 150', mov the model's altitude requires 15 floor. And, if you misjudge by itude, this requires 12½ feet of Hold the pole horizontal so you one direction or another. It's sounds, since corrections can be ways as the model approaches for

An instant after the prop pa pole tip so the line hits the le polyhedral break. As contact is stepping back. Retain contact l to rotate the desired number of either in a circle exactly cente circle slightly upwind of the dr want the model to travel should steps 3 and 5 above. Contact wi allowed ten seconds, since a 180 three seconds of contact.

Release contact by moving the angle from the leading edge outb this motion a fast but deliberate bunch of garbage (commonly refer bracing) attached to the leading might be embarrassed by being una easily. If your model flies with never mind, I won't get involved

The old adage "practice makes here. It's best to practice at l ice often. Bring your own gear a word of caution: avoid hitting y clear of the prop. After a few f it's better to put a little beef Also, keep an eye out to make sur doesn't foul someone else's plane

MORE ABOUT BILL E

The January issue of INDOOR protest letters aimed at Bill Ef turbing comments about the sport wrote us after receiving a copy we followed up with a letter to

In one of the recent copies made a rather clever comment whic thought that indoor fliers suffer

ness since we opposed his suggestions. (From the number of letters of praise and agreement we have received, it is safe to assume that all indoor fliers oppose him.)

Bill's latest reasoning is that the new indoor(?) events he is promoting will be necessary to get enough people interested to open up new sites, primarily the big domes such as are under construction in Houston. In our answering letter we said in part:

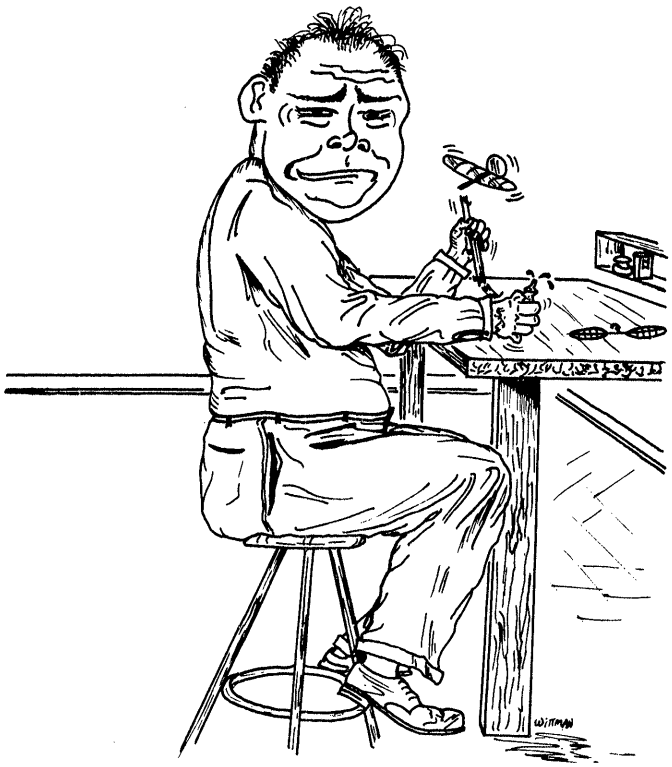
"There is some doubt as to what we can do about it, but I feel the indoor fliers are far more wide awake than you think. Maybe you do realize it and are just trying to cover up. I must stress one more time that your continual reference to the proposed "new indoor events" can only bring harm to one of the few pure forms of model flying left.

You say "I hope they (meaning indoor fliers, I presume) wake up to the fact that we will shortly have enclosed baseball and football fields in many of the big cities. We will need new events if we want to get enough people interested to use them for flying."

What you fail to realize (or blatantly refuse to recognize) is that our plight of no sites or inadequate sites will certainly not be alleviated, and probably will be aggravated by your program. First, if these sites are opened for powered events, indoor models can not co-exist with them in the same flying space. Second, it is highly likely that your program will develop into a paid attendance type of activity (Fine, sez your boss as he rubs his hands in glee and watches sales boom) - sort of a no-risk Go-Kart deal. With this precedent firmly established, indoor fliers (with no revenue-producing potential) will have to pay high fees or not use the site.

Finally, in those smaller cities where the spectator participation would not support one of those wonderful domes (by the way, just how many such domes are now planned? I have only heard of one!) the kiddies will clamor for permission to use the same sites indoor fliers (the real ones) have worked to get to fly their 'indoor models.' A few sessions and mishaps with these wonderful creations of yours, and the sites will be closed forever. What is gained?

"BARRACKS, TEN-HUT!!"



THE LAB

In the February issue this column was initiated and we pointed out the desirability of a series of standard tests for our materials and procedures. Then we set up a series of proposed tests for microfilm. We have had a few comments on these tests and have some suggestions for further tests.

We proposed a viscosity test as one factor that could be recorded and controlled. The immediate reaction was that viscosity is worthless for rating film - and this is so, if you mean to compare different types and formulae of film. The intended purpose of the viscosity test was to check different batches of the same formula for uniformity between batches, and to check on solvent evaporation between the time you poured a few sheets last month and when you are ready to use it next time.

Lew Gitlow has the following to say with regard to the rupture test: "One must work with a single color, that is, each sheet must be uniform. (Gold to blue means that the sheet is twice as thick in the blue area.) Then, the same color should be used throughout all tests. If you are measuring tensile strength it is important to have the weight distributed uniformly on each segment of area. Each test must be made on equal areas of film."

On weighing film, Lew says, "Use 10 in. square hoops to give 100 sq.in. This saves work in the long run. Tear off the film, weigh it directly and you will have the weight/100 sq.in. A balance that takes the weight of a hoop can't be sensitive enough to weigh the film."

Lew continues, "The stickiness test could be of some use in my opinion, but the consistency of results after at least four trials, and the % of deviation from the mean are as important as the technique, and paramount over the data."

Ron Draper of England suggests the following tests to add to the list:

1. Initial setting time. To be recorded as the time it takes for the film to set after being poured or until colors and/or wrinkles appear. He also suggests that these times be noted as a function of water temperature.

2. Evenness of film. Count the number of colors you can see in one sheet of film. This would give a good clue to the spreading qualities of a given formula.

3. Pouring thickness. This test would record how thin a sheet could be poured from a given batch and still be useful. From the little information we have on tightening film as the Germans do (for uniformity of wing sections) it appears that most surfaces will not withstand a thicker film than gold if it is to be tightened, or else the structure will be deformed.

We posed a question on how the stability of film could be measured. Ron Draper suggests that two thin wires be supported with a balsa frame and freshly-poured film that has dried off be attached. The wires would bow together in proportion to the tension in the film as it cures, thus giving a measure of the dimensional stability. The rate that the bowing develops would also give a clue to the rate of cure, or how long the film needs to age before it is safe to use.

Next month: A quality test for rubber that is non-destructive and can be applied on the field.

NEWS FROM AROUND THE WORLD

CALIFORNIA - MOFFET ELIMS

Cool weather was the prevailing condition for the FAI Quarter Finals, but drift was quite low and a lot of test flying was done. Although the hangar is soon to be out of service as a flying site when the Lockheed RIFT project moves in, record trials are planned for May 19, and for some time in June, July and August. In each case Joe Bilgri must be notified ten days in advance if you plan to attend. Joe can be reached at 1255 Blackfield Drive, Santa Clara, California.

CALIFORNIA - SANTA ANA

Besides the FAI elims, the April 14 session in Santa Ana hangar also served as a general check on the hangar condition and the night lighting system. Some drift is still present at times, but the flying is very much improved over previous years. The lights in the hangar

were given a thorough check-out by running the session until 9 PM. The effect of the extra heat on the models was negligible, but the bright lights make it rough on timers and those using balloons.

CALIFORNIA - VISALIA

The Sky Kings of Visalia have scheduled a series of indoor contests in the Mt. Whitney High School gym. The contests will alternate between Easy B contests and indoor scale. Contact Don Farnsworth, 2040 Cecil Circle, Visalia, for schedules and dates.

ILLINOIS - CHICAGO

The Chicago Aeronuts have been blessed with very good conditions in the Madison Street Armory for their contests and Record Trials. This is reflected in the high times posted at each event.

Pete Sotich has concluded that the series of Record Trials held in the Armory this year has greatly increased the attendance average. When there is no sanctioned event on tap, the attendance is low - which doesn't hurt the feelings of those who do come. Plenty of room to test!

LAKEHURST ELIMS AND RECORD TRIALS

The first two sessions in Lakehurst #5 were beset by disappointingly cool weather, and the FAI elims were also bothered by smoke from off-base fires that filtered into the building. One of the highlights of the first session was the fine scale flying with several models by Ted Pfeiffer.

Timers were at a premium at the FAI elims, and a lot of valuable help was given by Lt. Thibodeau, Dave Call, Walt Dickensen, Mrs. Greenberg, Pete Triolo, Alice Rudy, and Patricia and Lorraine Russo. CD "Russ" Russo gives these people full credit for the meet's real success.

LOUISIANA - SHREVEPORT

Mark Valerius reports that local times have jumped quite a bit after visits to the Dallas FAI elims - and proves all over again that newcomers can benefit a lot by visiting with fliers in other areas.

MICHIGAN - DETROIT

Gusty conditions prevailed in the Coliseum during the FAI elims, so everyone took it easy. Paul Crowley notes that the ballooning techniques are improving - only one flight was called because contact exceeded the ten second limit.

NETHERLANDS - ROTTERDAM

Cornelis Wolthoorn reports that he has upped the Dutch indoor record to 3:47 in the 20' site he has been using. A heavy school schedule has considerably slowed his building, but he hopes to get more flying in soon. So far, only a few have flown indoor, but he feels that more will soon start.

OHIO - LAKEWOOD

The All-Scholastic Aircraft Show and Record Trials, sponsored by the Cleveland Press, the St. Edward Aeronautical Society, Cleveland Recreation Division, and a host of aircraft sales agencies and aviation book publishers, was a no-entry-fee affair. Age classes for Freshman, Sophomores, Juniors, Seniors, and Open in both flying and non-flying events made it a big show, and prizes were awarded through fourth place. The record trials drew top fliers, as the list of new Cat. I records shows. (See Record3? Maybe!)

SOUTH AFRICA - CAPE

Pat Curtis and five other members of the Western Province Model Aircraft Club (membership about 40) have been trying some indoor flying recently. In spite of a great lack of suitable supplies, the interest level is high and they are "hot to trot" on some more sessions. They are making quite good headway in spite of their lack of good materials, and they feel that progress will be a matter of more practice.

TEXAS - DALLAS

The rather bleak test-flying prospects in Dallas were relieved somewhat by the opening of Walnut Hill for the summer season of indoor flying. The schedule calls for a session on every other Wednesday from 7 PM to 10 PM, and the first session was May 8. This session was devoted almost entirely to testing of models to be flown in the South Central Semi-Final on June 8.

Walnut Hill Recreation Center, with a 20' smooth ceiling, is a prime flying site whenever the drift is low. The evening schedule we now have almost assures good air since the main cause of drift has been uneven heating due to the sunlight in the daytime.

VIRGINIA - LANGLEY FIELD

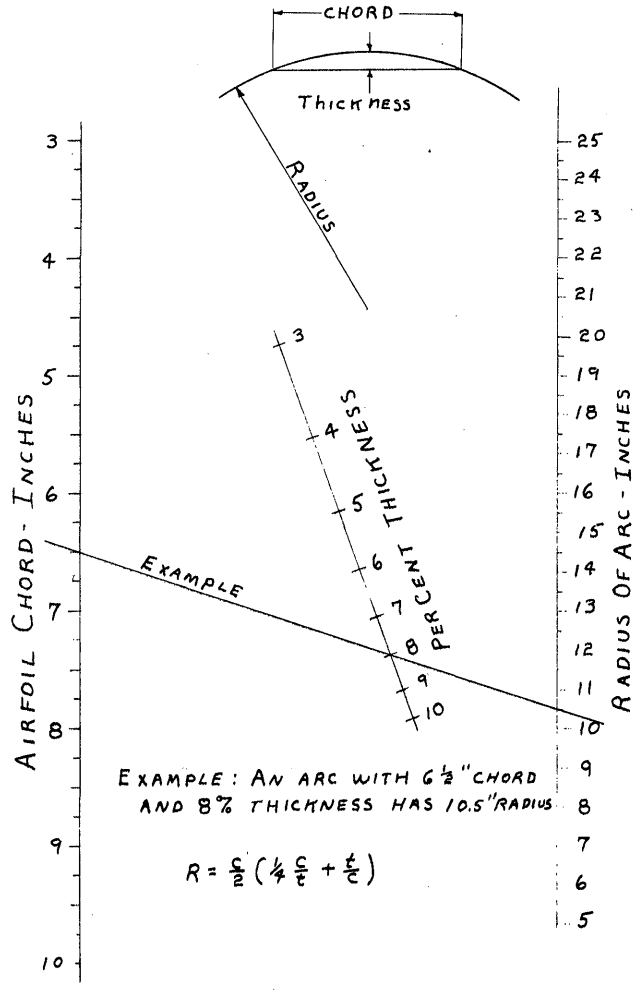
Once again drift conditions were poor in the 22' smooth-ceiling hangar site, this time due to high winds outside. Rubber times were low as a result, with the best time of the day set with a "D" stick belonging to Phillips - 9:27.7. The best non-FAI rubber time was by Woody Blanchard's paper stick - 8:45.5 Libby won the HL event with 0:17.0.

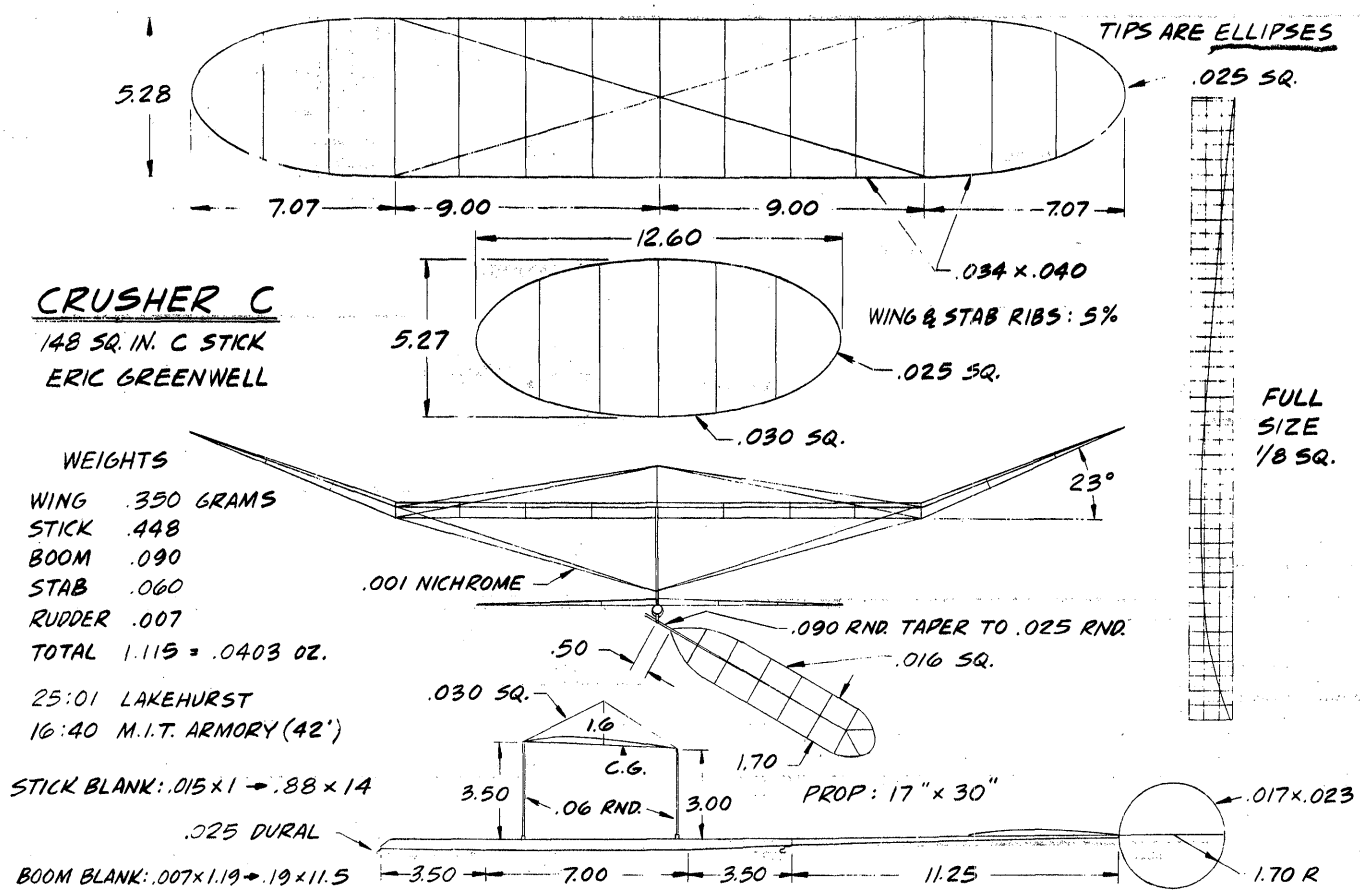
AIRFOILS

For some time reports have been filtering in from all over the world about experiments involving arc airfoils, so we saw the possible need for this nomogram to aid in design of airfoils of the arc type.

Normal airfoils (perhaps we should say conventional airfoils) can be plotted to that chord which will fit the longest station in a tapered wing, and the shorter ribs which are required can be made by cutting excess length from the trailing edge of a longer rib with little change in the airfoil characteristics. Not so with arc airfoils; if they are trimmed in length the new rib is quite a bit thinner (% thickness) than the root rib. Thus the ribs for a tapered wing must be individually plotted if an arc type airfoil is used. This nomogram will greatly speed up the process of making any wing with an arc, and we hope that enough people will try this type of wing design so we can find out if it is superior to the conventional method of doing things.

Charlie Sotich designed this nomogram, and its use is practically self-explanatory. Go to it, and let us know how the new one flies!



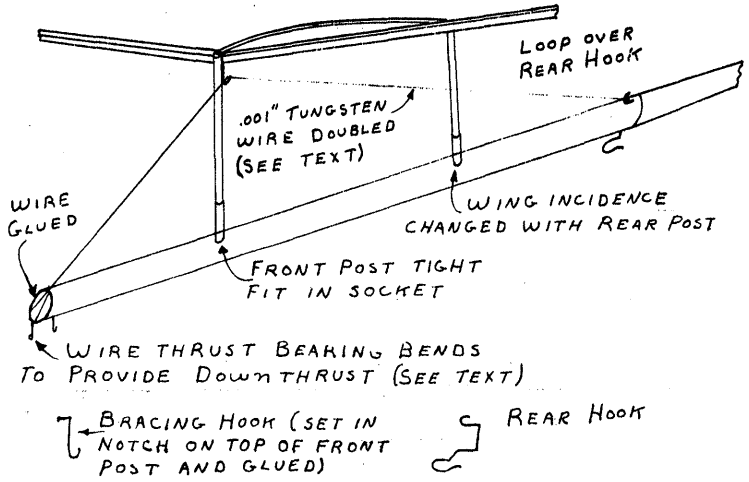


HINTS AND KINKS

Lightweight Fuselage Bracing

Another variation on the monowire fuselage bracing is shown below, as used by Jim Skinner. The bracing wire is a loop with the free ends glued to the front of the motorstick and the doubled end looped over the special rear hook. After the wing is assembled to the fuselage, the wire is strung across the hook on the front post and the motorstick is bent up enough for the wire to hook in place. Adjustment of the brace wire length can be made by trimming the length of the front post; wing incidence is adjusted by moving the rear post.

Two hints for the price of one: Jim's front thrust bearing is a music wire double bearing (INAV, July '62) that is made from .012" wire. This size of wire bends enough (on fully wound .055" Pirelli) to give enough down thrust to avoid a power stall and to give a more consistent climb.



"Quickie" Microfilm Hoop

With an unusually good run of pouring film one night, Ron Ganser ran out of balsa hoops. He then discovered that the wire frames used for holding the crease in work pants while drying would work as a hoop. One drawback: since the wire frames don't float, it requires someone to help. The frames are adjustable, and ideal in size for "C" wings. A plus factor: since the frames are adjustable in width, the film can probably be slackened for covering by making the frame narrower.

STATE OF THE ART

The Tech Model Aircrafters of M. I. T., under the expert guidance of Ray Harlan, have been making the most of their 42' Armory. The ceiling is cluttered down to about 35', which fairly well spoils any advantage the extra ceiling might have.

One of the seven records the club holds was set in the Armory, and represents a really fine flight. Eric Greenwell designed the model of the month, the "Crusher," and flew it to a Cat. II Senior C Stick record of 16:40.

RECORDS? MAYBE!

DALLAS AREA FAI INDOOR QUARTER-FINALS, April 20, 1963
Cat. II, SMU Coliseum, Dallas, Texas, 56' ceiling.
Senior B Stick - 13:53.1, Nickey Jones
ALL-SCHOLASTIC AIRCRAFT SHOW, April 21, 1963
Cat. I, St. Edward High School, Lakewood, Ohio (33')
Junior B Paper - 7:00.1, Bernie Wisniewski
Senior C Stick - 9:48.4, James Gaffney
Senior B Paper - 8:50.0, Jim Skinner
Senior B Cabin - 6:54.0, Larry Loucka
Senior C Cabin - 5:57.0, Larry Loucka
CHICAGO AERONUTS INDOOR RECORD TRIALS, April 27, 1963
Cat. II, Madison Street Armory, Chicago (75' ceiling)
Senior Paper Stick - 13:22.8, Dave Erbach
Senior B Cabin - 6:24.2, Dave Erbach
Senior Autogyro - 1:21.4, Dave Erbach
Senior Ornithopter - 1:15.0, Dave Erbach

THE HAND LAUNCH GLIDER

PART 14 by RICHARD MILLER

DESIGN
(concluded again!)

Wing Loading and K-factor Compatability

When all other aspects of hand launch glider design have been combined to the satisfaction of the designer, there remain two vital factors of paramount importance to be considered. The first and most obvious of these is the rate of sink of the glider and the other is its altitude potential - the height to which we can hope to throw it. It can readily be seen that our total duration is going to be a product of these two elements.

(Therefore how this got included out of the main body of the 'Design' part of this series is a little difficult to say. But insomuch as 'Construction' bears so heavily on wing loading, which is what we're getting to, perhaps this is the best spot for it.)

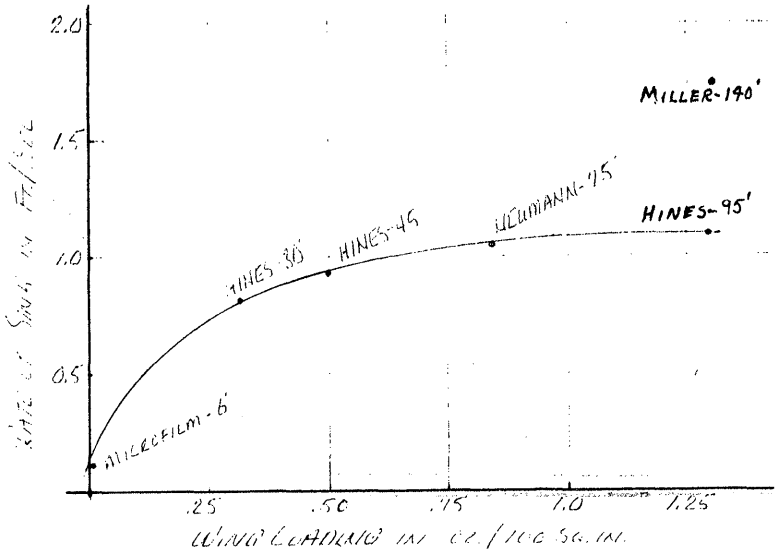
Rate of Sink

While duration is directly dependent on rate of sink, the rate of sink seems to be dependent in turn on wing loading. The design of the glider, particularly airfoil thickness and undercamber, will have a lot to do with the sink rate but all else equal it is wing loading which is the dominating factor.

To demonstrate the relationship between wing loading and rate of sink, and to give the reader an indication of how light (or heavy) he must build in order to be competitive, I have prepared the accompanying graph. This is risky business at best, however, in the case of Indoor HLG. There is a scarcity of accurate information about gliders, for one thing. For another there are variables such as estimation of height gained, time it takes the glider to get to the top of its trajectory, thermal assistance, corrections for projected areas and many more that are bound to make even the best figures somewhat haphazard.

Nonetheless we are fortunate in having one design which has made optimum flights under a variety of ceiling heights and one on which rather careful records have been kept - Lee Hines' Sweepette. Two of these are the standard Sweepette, one is Lee's 16" span version and one is the modification used by Tommy Neumann. At the low (rate of sink) end I have thrown in a (ugh!) microfilm glider to round out things. Data on the Sweepette have come from the published specifications of the designers and that on the microfilm glider from p. 142 of Zaic's Model Glider Design.

Glider	Area	Weight	Loading	Sink	Ceiling
Microfilm HLG	66.5	.0058	.009	.1-.15	6'
Hines - 30'	44.0	.145	.32	.79	30'
Hines - 45'	57.0	.285	.50	.87	45'
Neumann - 75'	57.0	.46	.84	1.09	75'
Hines - 95'	57.0	.75	1.3	1.19	95'



Even with a wide allowance for error I think that these figures show the strong relationship which exists between wing loading and rate of sink. There is undoubtedly a lot more flexibility under high ceilings than under low as the position of my Omega on the chart shows. This model had the same wing loading as Hines' 95' Sweepette (1.3 oz./100 sq.in.), went a lot higher, but came down a lot faster. Nonetheless I'm convinced that nothing like this range of altitude and sinking speed is possible under limited ceilings.

A couple of other things are worth pointing out concerning the graph and the curve. The first is that approximately 60 feet seems to be the highest one can throw today's HLG and achieve a 1 ft./sec. sinking speed. This is quite remarkable as anyone who has tried it will quickly agree. I have the feeling that heavy competition in low ceiling flying will cause the figure to inch up slowly in the years ahead. The other curiosity is how closely the wing loading in oz./100 sq.in. of the low and medium ceiling balsa gliders matches the ceiling height in feet. (Column #3 and #5) This can provide the person building for a limited ceiling height with a general index to guide him when it comes to determining the weight of the glider. He'll soon find out that knowing what weight to shoot for and building within those specifications are two different matters, however. And as he struggles with the area between them his respect for the low ceiling champs will rise accordingly.

K-factor Compatability

As we move from limited to unlimited ceiling conditions the second of our two factors, altitude potential, comes into play. Consequently there is a shift of emphasis. Building down to weight, which was the all-important thing under the limited ceiling, now becomes a secondary concern. Throwing the glider as high as we can, which is a product of our strength and general physical capabilities, replaces it as the primary consideration.

How far or how high we can throw an object depends to a much greater extent on the physical properties of the object than it does on our strength, however. Just about anyone of moderate strength can throw a BB (down boys!!) a hundred feet or so but I doubt that the strongest person in the world can throw an equal weight of Kleenex, loosely wadded, more than a few feet.

What we are concerned with in the case of the HLG is the amount of inertia we can impart to a glider - a Quotient of Inertial Input - on the one hand; and what th glider does with it on the other - a Quotient of Inertial Expenditure. I would guess that the Quotient of Inertial Input would depend directly on the distance, velocity and inertia with which one's hand moves during the launch and be related ultimately to the thrower's general physique, musculature, agility and motor responses. The Quotient of Inertial Expenditure would be largely dependent on the size and weight of the glider in question.

The problem, it seems to me, is to match these two quotients in order to get an optimum performance potential. Furthermore it seems to me the best way of matching them is to bring in the K-factor, expressed by Area/Weight$^{2/3}$. I am unable to go any further with this mathematical-mechanical formulation because I haven't the slightest idea in the world how to do so. Nonetheless I'm convinced that each individual is best served by one, and only one specific type of glider, large or small, heavy or light; that this type can best be expressed by the K-factor; and that it is possible to express mathematically the degree of K-factor Compatability between the physical properties of the glider and the morphological constitution of the launcher.

Perhaps some young mathematical Lochinvar will gallop out of the West one day with a reasonable formula by which to express K-factor compatability. Perhaps the whole problem is nowhere so complex as ignorance makes it seem. At best such a formula could only serve as a rough guide to anyone searching for just the right glider however, and he would have to rely ultimately on his own feelings and experience to direct him in his quest.

If and when he achieves this happy combination he becomes a candidate for a fleetingly magic moment which comes every so often to the lucky HLG thrower - one which, if you study this series of articles religiously, eat your Wheaties and live a blameless moral life, you too may stumble fortuitously on one day. It occurs during the launch, just in that fraction of a second before the glider and the hand finally part company. Your entire body is free of the ground and all your weight and energy can be felt in the end of the index finger, pressing into the finger rest of the glider. It is an electrifying experience and a certain sign that, whatever the limits of your strength or of the glider's design, you are getting the most out of the materials at hand. Watch for it, and make the most of it when it comes.

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." JUNE 1963

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

NIMAS members who joined in May:

ED BOJANOWSKI, 2250 South 24th St., Broadview, Illinois
FRANK CUMMINGS, 1112 West 254th St., Harbor City, Calif.
WILLIAM DOWNEY, 7486 Button Road, Mentor, Ohio
BILL GOUGH, 1536 W. Victoria St., Chicago 26, Illinois
E. C. HANFORD, 1417 Clemens Place, Reynoldsburg, Ohio

Thoughts For The Month

As we looked over the FAI Indoor results for 1963, a disturbing trend in local elims participation became apparent. Consider the following chart:

Location	'62 entry totals		'63 entry totals	
EAST COAST				
Lakehurst	9		14	
New York	7		0	
Virginia	0	16	3	17
CENTRAL ZONE				
Detroit	10		11	
Chicago	14		9	
Cleveland	18	42	15	35
Dallas	8		9	
Kansas City	1		0	
Wichita	1	10	0	9
WEST COAST				
Los Angeles	10		9	
Moffet	13		9	
Santa Ana	0	23	6	24
		91		85

Note that the overall total of starting contestants is less in 1963 than in 1962 even though total indoor activity was higher.

Many of the fliers who didn't enter (even experienced fliers) excused their failure to enter with one of two reasons: 1. I can't get off work to go overseas even if I should win, so why bother? 2. The other fellows have too much experience - I don't have a chance!

As a result, indoor modeling in general and FAI in particular lost two ways: First, some serious contenders were eliminated in the first round; second, the total income from the program is then lower, resulting in less money to finance travel expenses of the team members to the point of departure for the Finals.

The loss of serious contenders can be explained when we remember that half the local elims entrants were eliminated. To take Detroit as an example of less experienced fliers entering, there were eleven entrants and six of them qualified. If those five had not entered, Phil Klintworth, Clarence Mather and Hardy Brodersen would have been eliminated. Each of these is an experienced flier and deserved to go on.

All active indoor fliers should participate in the local elims, thus helping themselves and the program. The hobby loses by not having the experienced fliers in contention since these fliers help to advance the state of the art; those who don't enter lose the experience they would have gained, besides not having the valuable opportunity of finding out how their own efforts stack up against those with more experience.

The most important aspect of the revenue loss is related to the FAI program as a whole. Since this program must be self-supporting, the only way it can be kept alive is through voluntary participation of the fliers, or through donations - and donations are mighty few!

The chart above fails to point out another factor which acts as a deterrant to the development of the most effective FAI Indoor Team - the lack of leaders for the program. To date, no one except active and serious contenders has volunteered to handle the administration of the program. Thus each year we have had at least four top fliers shackled with a mountain of administrative work, when they should be free to devote their time to research that will advance our team's chances in the Finals. It is a crying shame that many of our fliers who for one reason or another cannot participate at the Finals level still do not volunteer for the top level administrative posts and free the serious contenders for full time work on their models.

FAI INDOOR REPORT

We had hoped to have the complete list of qualifiers for the Semi-Flyoff in this issue, but two things stand in the way. First, we erroneously published the date of the East Coast Semi as June 2, when in reality it is June 16. Second, teen dances, complete with a false ceiling, have caused the Coliseum in Detroit to become unavailable. After frantic searches for another site (including the Madison Street Armory in Chicago) it was decided to move the Central Zone Semi to Lakehurst on June 16. It is very unfortunate that this was the only possible solution due to the very short time remaining before various deadlines. Late word from Pete Sotich indicates that none of the Chicago qualifiers will be able to arrange time off from work to make the trip, and there has been no word from Detroit and Cleveland on how many will be able to make the trip.

Quarter-Final Results

DETROIT, MICHIGAN - May 12, 1963 (65' ceiling)

Twelve qualifiers			Total
Dick Kowalski	25:26	27:44	53:10
Paul Crowley	26:02	26:23	52:25
Clarence Mather	22:45	26:43	49:28
Ed Stoll	22:10	21:44	43:54
Phil Klintworth	22:26	20:25	42:51
Joseph Hindes	20:12	21:07	41:19
Pat Green	17:38	17:20	34:58
Lou Willis	16:26	18:24	34:50
Ron Ganser	17:32	16:25	33:57
Bill Hulbert	15:42	17:51	33:33
Ed Cenkner	14:52	18:25	33:17
Norm Getzlaff	15:26	16:31	31:57

CHICAGO, ILLINOIS - May 25, 1963 (75' ceiling)

Charlie Sotich	24:20	24:17	48:37
Bob DeBatty	22:15	23:37	45:52
Don Kintzele	22:36	23:03	45:39
Curtis Janke	17:59	21:52	39:51

LAKEHURST NAS, NEW JERSEY - May 19, 1963 (170' ceiling)

John Triolo	34:29	32:26	66:55
Ernie Kopecky	29:05	32:52	61:57
Ted Gonzoph	27:10	33:09	60:19
Bob Champine	30:18	29:40	59:58
Ray Harlan	26:59	25:49	52:48
Pete Andrews	23:00	23:19	46:19
Julius Rudy	21:19	19:09	40:28
Reggie Batterson	14:36	15:17	29:53

Semi-Final Results

SANTA ANA, CALIFORNIA - June 2, 1963 (180' ceiling)

Tom Finch	41:27	35:15	76:42
Bill Atwood	37:10	37:56	75:06
Frank Cummings	36:40	37:46	74:26

DALLAS, TEXAS - June 8, 1963 (56' ceiling)

Stan Chilton	20:03	14:48	34:51

PLANS FOR THE SEMI-FLYOFF

When we contacted Bruce Paton (CD) for info on the Semi-Flyoff, he said that he had no word of final arrangments as of June 8, 1963. Some time ago he notified both

AMA Hq. and the FAI Indoor Committee that it would take an AMA request through the Navy to secure the desirable two consecutive days for this event.

Therefore, as it now stands, the Semi-Flyoff will be held on August 3. There will be two rounds of 3 flights each, the first round starting at 10 AM and the last flight of the round to start no later than 3 PM. The second round will start at 3 PM with the last flight to start no later than 7 PM.

If the arrangements are completed for a two day schedule, the first round will be on the first day with official flights to start at 12 noon and the last to be no later than 6 PM; the second day will have a similar schedule.

THE LAB

Last month we promised an article on rubber testing; due to the press of FAI competition and administrative details Dick Kowalski was unable to complete the article. We hope to have it soon; please bear with us.

Prop Testing

The following in-flight test for propellors is passed on by Dick Kowalski. As presented, it does not permit measurement of absolute efficiency of propellors, but it indicates which prop of several is more efficient in the cruise portion of flight.

Propellor Efficiency - Schwebbeliestungs Method

Install a rubber motor of similar weight to that used in flight. The size is not important!! Put in enough turns to allow a mild climb. Just as the model ceases climbing and goes into level flight, measure the RPM (I count time for 10 revolutions) and measure the torque required. The lowest value of level flight RPM x level flight torque moment gives the highest efficiency. This test should be done in a draft free area since the downwind values are higher and the upwind values lower.

In the absence of a torque meter a fairly close approximation can be made by making several flights with the same number of turns in the same weight of rubber and averaging the results. (Editorial comments)

QUESTIONS AND ANSWERS

26. How do you repair holes in microfilm, particularly on wings which have been braced?

The ease of repair on microfilm depends primarily on the size of hole, but some holes seem to appear in the most inaccessible places! For holes much larger than one rib spacing wide (especially deep inside a braced area) it is usually better to strip the bracing back and recover the area.

For small holes no matter where the location, it is easy (after much practice) to repair the damage. Two basic methods can be used, depending upon the circumstances. The idea is to transfer a piece of film from the hoop to the wing without wadding it up or dropping it, which requires a support for the film.

Method #1: Cut a piece of newspaper or similar (not slick or hard finish paper) about half an inch larger than the required patch. Wet the paper with saliva all around the outside edge, place it on the film, and trim around the patch and paper. With sharp scissors trim off all the wet edge (this requires very careful handling) and lay the film side over the area to be patched. If your film is the dry type, the edges of the hole will need to be wetted with saliva before applying the patch. Lift off the paper and the patch will be (usually) in place and stuck.

Method #2: This time the film support is a very light balsa frame. Several can be prepared ahead of time and stored; in an emergency use a wing or stab tip or fin from a wrecked or spare model. Wet the edges of the patch area and lay the covered frame film side down over the hole. Wait a bit for the film to stick better, then thoroughly wet the frame and lift it off carefully. If the patch area is a compound curve such as the top of a wing, the frame may have to be wet to help it mold to the curvature.

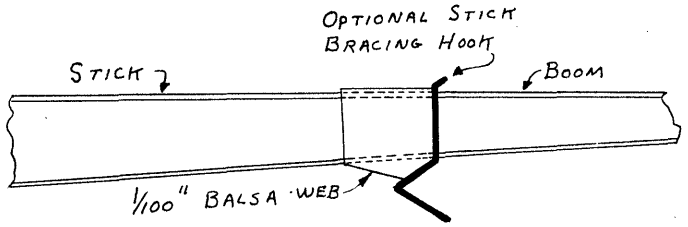
Fancy tricks!: Don Chancey uses pinking shears with method #1 - it gives an unusual effect, and the pinked edge seems to help support the film better. With method #2, the prepared frames can be round, elliptical, or s other fancy shape; careful trimming and careful patchi will yield fancy patches of the desired shape.

Since film patching is a vital part of contest work, we welcome any further suggestions which might be of interest.

HINTS AND KINKS

Improved Rear Hook

Rear hooks have remained much the same over the years and most of them have been hard to hook a "loaded" motor up to, and even harder to get the motor off in an emergency. Shown below is an improvement which is easy to hook up, and even a tightly wound motor will slip off easily by pulling the motor straight back. Use the usual balsa web re-inforcement to strengthen the mounting.

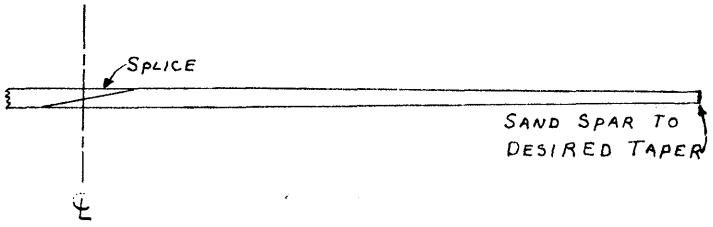


New Glue Stick

One night, when some friends across the table had "borrowed" the only glue stick we could find, we grabbed a piece of music wire as a substitute. We find that it is better than most glue sticks since the glue runs to the tip and forms a tiny drop, just right for those small glue joints. To a certain extent, the wire diameter wil determine how much glue is applied. Of course, how dee you dip it and how thick the glue is also varies the amount of glue applied.

"Quickie" Prop Spars

Rather than taper a prop spar during the process of rounding it off, carefully taper the spar with a sanding block to the desired degree of taper, then sand it round in the usual manner.



NEWS FROM AROUND THE WORLD

CALIFORNIA - LANCASTER

Jim Kelly, who works for NASA on the X-15, has set up a record trials (Cat II) in an Air Force hangar at Edwards Air Force Base. Ceiling is 97½', floor area is 300' x 400', and the date is July 6-7, 8 AM to 6 PM. For more info and entry blanks, contact Jim at 44246 North Cedar, Lancaster, California.

CALIFORNIA - MOFFET FIELD

No record trials will be held at Moffet in June, and it is possible that the trials scheduled for July 14 may be the last one. If you plan to participate, Joe Bilgri will have to have your name, address, and place of birth at least ten days in advance. Joe Bilgri, 1255 Blackfield Drive, Santa Clara, California.

CALIFORNIA - SANTA ANA

Besides the 41:27 flight that Tom Finch put up, there are two items which stand out: First, the humidity never got below 86% all day. Second, the drift was negligible all day and Finch didn't have to balloon the model at any time.

The Sky Hoppers of Orange County have their Quarterly indoor contest coming up June 30. The following events will be held: Open Stick, Open Cabin, Paper Stick, Easy B, HLG, Monoplane Scale, and Biplane Scale. All age classes are combined in all events except for Easy B, which is split Jr. & Sr.-Op.. Entry fee $1 per event, trophies to third place in all events.

FINLAND - HELSINKI

Esko Hamalainen reports a difficulty in common with several U. S. towns - someone is using their site! In April they had a contest, but since then and until June the site is taken up by an ice show from Moscow. After the show leaves, however, they will have access almost every day.

MICHIGAN - DETROIT

In the days of intensive test flying just before the Cloiseum was closed to model flying, Dick Kowalski made two unofficial flights over 30 minutes below the 60' mark. Category II fliers take heart - it can be done!

OHIO - REYNOLDSBURG

E. C. (Scotty) Hanford reports that the Reynoldsburg high school gym is close to 35' with a smooth ceiling. The principal has said that the site could be available most school days until 11 PM provided he has an organization to deal with.

If there are any indoor fliers in Reynoldsburg or eastern Columbus, this may be your chance! Scotty may be reached at 1417 Clemens Place, Reynoldsburg, Ohio.

SOUTH AFRICA - CAPE

Members of the Western Province Model Aircraft Club held their second indoor session in a different hall with 25' ceiling, but the drift was high. This group has a lot of enthusiasm and their flight times go up quite a bit each session. This time they almost made 4 minutes with microfilm models in spite of the drift.

STATE OF THE ART

Some time ago Charlie Sotich held the Paper Stick Cat. II record; Mike Karlack upped it at the Great Lakes meet only to lose it to Phil Klintworth's winning Nats flight. Last December Charlie took possession of the mark once again with a model of the same basic design as before. Charlie tells the story of the model and flight:

"Two models of this design were built early in 1961. Since then a couple of new wings have been built to replace ones damaged in the light fixtures and girders at the Madison Street Armory. The original rudders were the conventional round type, but they were replaced since they were more susceptible to damage and took up more space in the box than this shape that I copied from Tommy Neumann.

On the flight that the model did 16:19.6 it went up to about 65 or 70 feet and cruised there below the girders, and came down without hitting any obstructions."

RECORDS? MAYBE!

WEST COAST FAI INDOOR SEMI-FINAL - Santa Ana, California
June 2, 1963 Cat. III, 180' ceiling
Open D Stick - 41:27, Tom Finch

SOUTH CENTRAL FAI INDOOR SEMI-FINAL, Dallas, Texas
June 8, 1963 Cat. II, SMU Coliseum, 56' ceiling
Senior Helicopter - 6:30, Nickey Jones

June 8, 1963 Cat. I, SMU Coliseum corridor 26' ceiling
Senior Helicopter - 6:31, Nickey Jones

Last month we listed five records from the April 27 Aeronuts session at the Chicago Armory. On the listing we received, one record was omitted and another was listed erroneously. The correct listing follows:

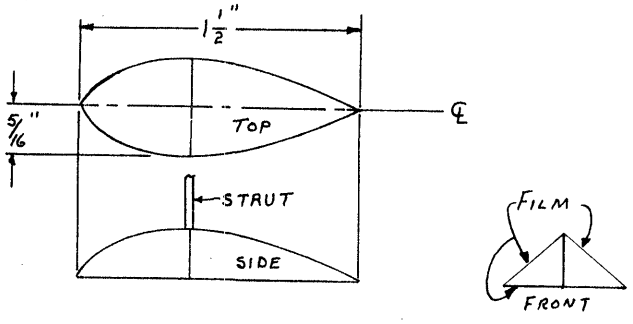
Cat. I, Madison St. Armory Lecture Room 22' ceiling
Senior Autogyro - 1:21.4, Dave Erbach

Cat. II, Madison St. Armory Drill Hall 75' ceiling
Senior Autogyro - 2:21.4, Dave Erbach

****CHANGE OF PACE****

In recent years there has been very little activity in Cabin ROW events, and perhaps this is due to lack of information on the basic techniques. With the able aid of Dave Call we present the following on floats in case anyone is interested in trying something off the beaten track.

In the first sketch below, we show approximate dimensions for class B floats. Since the basic configuration is for two floats in front and one in the rear, the dimensions shown are suitable for the front floats. The rear float can be slightly smaller since it has no torque load and very little weight to support.



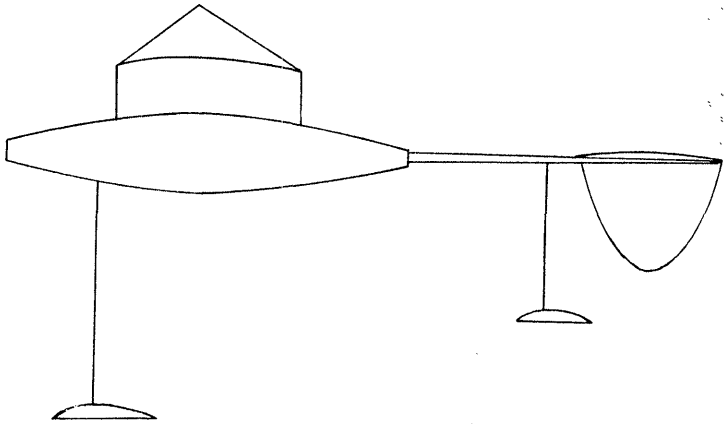
The floats are constructed from .025" - .031" stock. Build a jig - male and female to accept the stock thickness. Soak the outline strips in water, bend them over the form and bake in the oven until the wood is slightly brown. Assemble the framework and use a thinned solution of rubber cement to attach microfilm in the pale red and green range. Cover the three sides of each float separately and then seal the edges with rubber cement, allowing 48 hours to dry.

Apply zinc stearate to each section of film with a balsa spatula and rub it on with your finger. Repeat the process several times until the film appears "mother-of-pearl" in color. Blow lightly to remove the excess zinc stearate. Attach the struts and complete the assembly.

To check for leakage, immerse the entire float for ten seconds, then examine all the seams with an eye loupe or magnifying glass for leaks. If the waterproofing was successful, the float will emerge completely dry.

The strut must be made of firm, flexible wood. An unbraced "B" strut should be oval, .078" x .062" and taper to .062" diameter at the float end. The left strut should be stiffer to prevent the float from "digging in" on a full torque take-off. A typical weight for the float assembly (B Cabin) is .006 - .0065 oz.

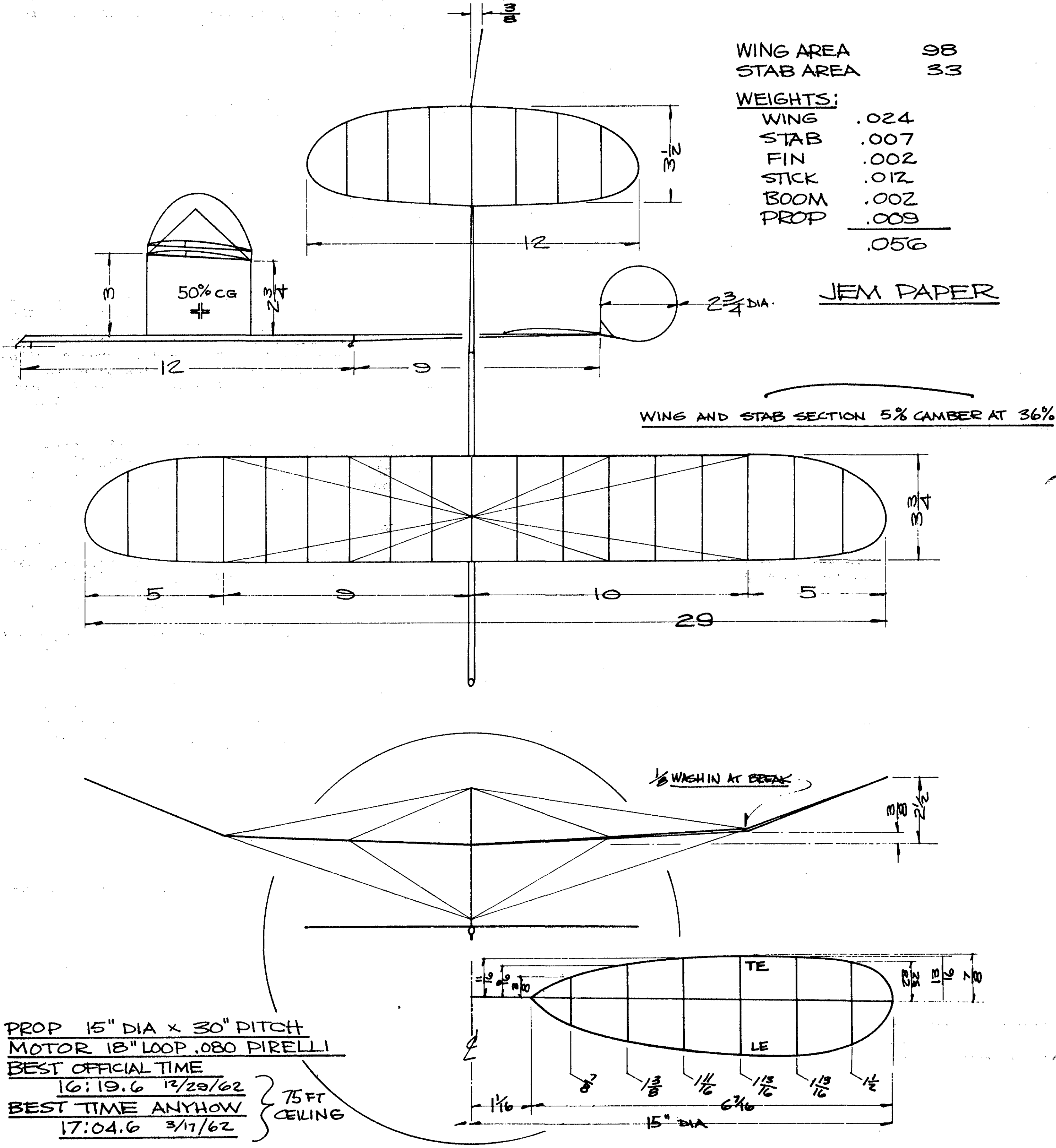
Refer to the second sketch for mounting. The front floats replace the wheels, with the rear float added as shown. Take-offs are a matter of practice, and the art has to be developed. It looks like fun - bring your own tank and let's fly!



DEUCE DIP III INDOOR PAPER STICK

CHARLES SOTICH

ILLINOIS MODEL AERO CLUB



INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." JULY 1963

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

The month of June brought only one new member to the fold - Sponsored Junior Member James Mayes, 413 Sharr Ave., Elmira, New York. Jim started in indoor all on his own, after quite a bit of experience in outdoor free flight. His top IHLG time in a 20' ceiling is 23 seconds, and an average of 20 seconds - all with an original glider. In addition to this activity, Jim has formed the 7 member Elmira Indoor Model Airplane Club. The club membership consists of boys ranging in age from 11 to 14, who meet once a week at the local YMCA. A required club project is the club HLG, and most of the members have moved on to Easy B's.

Contest Board Action

Recent action by the Free Flight Contest Board approved the proposal to add FAI Indoor to the AMA roster of events, under the assumption that this was a final vote. It has since been discovered that the matter had never been submitted to the Board, and that it had never been published in Model Aviation. Since the proposal is to add an event, it will also have to be approved by the A.M.A. Executive Council. If it is approved, the three month study period will begin with publication in M. A.

At present the FFCB has a ballot covering the much delayed action to eliminate microfilm covered "soaring" indoor gliders. Some time ago the Board was asked to rate the four proposals which have been pending for over two years (the same four proposals that appeared on the NIMAS Ballot) and the results were about the same as the NIMAS Ballot results. Consequently, the Board has been asked to vote on the Detroit-Chicago-Wilmington IHLG proposal. The reporting date for the ballot is July 15. second ballot, due at the same time, will accept or ject for preliminary study the Detroit-Chicago-Wilmington IHLG scoring proposal (for best three of nine times). Hopefully, we will have a report on these two ballots next month.

NIMAS ANNUAL MEETING??

So far no plans have been made for a second annual NIMAS meeting, but if one is to be held, it will surely be held sometime during the week of the Nats. If you make it to the Nats, watch the AMA bulletin board in the building hangar and also look for a poster near the timer's table on Indoor day.

FAI INDOOR REPORT

Semi-Final Results

EASTERN ZONE SEMI-FINAL - Lakehurst, New Jersey
June 16, 1963 (170' ceiling - west end of hangar)

Bob Champine	33:21	36:01	69:22
Ernie Kopecky	32:33	33:56	66:29
John Triolo	32:12	29:29	61:41

CENTRAL ZONE SEMI-FINAL - Lakehurst, New Jersey
June 16, 1963 (170' ceiling - east end of hangar)

Dick Kowalski	36:54	39:13	76:07
Joseph Hindes	38:14	36:28	74:42
Ed Stoll	36:48	35:09	71:57

PLANS FOR SEMI-FLYOFF

Just before publication deadline, we received word from Bruce Paton confirming plans for a two-day Semi-Flyoff. At present it is planned to schedule two rounds of three flights each on Friday, Aug. 2 and Saturday, Aug. 3 from 8 AM to 5:30 PM. Bruce is going to try to get the hours extended to about 8 PM, and plans to send details of the final arrangements to each qualifier as soon as possible.

INDOOR SCALE

Ed Stoll of the Detroit Balsa Bugs has probably had more rubber powered scale models published than any other flier that we know of. In addition, he has been active in the scale program of the Balsa Bugs. We feel, therefore, that these remarks will be of benefit to indoor scale builders.

INDOOR SCALE TIPS

by ED STOLL

Construction

1. Pick a model that is inherently stable.
2. Scale the model to suit the size of the building. For example, in a 27' ceiling a 16" wing span would be about right. In the 65' Michigan State Fair Coliseum the size could be increased to about 22".
3. Construct the model with the following items in mind:
   (a) The landing gear takes quite a beating and must be properly reinforced.
   (b) Keep the tail assembly and wings as light as possible.
   (c) Scale rubber models are almost always tail heavy, therefore, the nose should be quite strong and the wood should be chosen with this in mind.
   (d) Make sure that the front and rear motor hooks are strong enough.
   (e) Be sure the fuselage is strong enough to take the stress of a fully wound motor.
   (f) Plasticize the dope so as to avoid warps and use as little dope as you can get away with.
   (g) Be sure the incidence angle is correct; biplanes in particular are difficult to adjust if there is a large variation in incidence angles between the two wings.
   (h) Plastic props have improved to the point where they are quite efficient and the imported wood props from Japan are also very good. For maximum performance the carved wood prop is best.

Adjustment

1. Balance the model so the Center of Gravity is about 50% back of the wing leading edge; in order to do this you will probably have to add weight to the nose.
2. The model will probably circle to the left with torque most easily; however, warps may make it necessary to circle to the right.
3. For the first flight, wind the model to about 40% of maximum and launch it close to the ground. Observe the flight pattern and make any necessary adjustments. On subsequent flights increase the number of turns and make further adjustments as necessary.
4. Remember that a model flying under full power will react more severely, so be sure of your adjustments before going "all the way."

PROP FORUM

In the past few months your editor's building time has largely been spent on props - sometimes it seems as if there have been hundreds of them! We started with the assumption that blade elements of the so-called "true pitch" prop near the hub seemed to be at too high an angle to contribute useful thrust. This line of reasoning was prompted by observing that (apparently) the prop stalled partially during the power burst. This then caused the model to hover and hesitate at launch and to wander in the climb. The experimental props presented here were designed by "seat of the pants" reasoning and are not supported by theory in the normal sense. We are not opposed to theory - especially when it is clearly defined and applicable. However, it takes time to properly apply theory with any degree of success, and prop theory is now rather incomplete as applied to indoor models.

Two different approaches have been taken. Since the blade area near the hub is the offender (by hypothesis), why not eliminate it? Our first prop of this type (and the most successful to date) is shown in figure 1, and was built for a class B Paper Stick. Props with this much spar offset depend upon careful wood selection and careful repairs (if needed) to maintain even flare between blades. Careful observation shows that this prop flares some during the entire flight, and unmatched blade components will cause uneven running and wobble during the whole flight.

The second design approach is to retain the blade area near the hub, but to reduce the blade angle of this segment. This is accomplished by modifying the prop block

PROP OUTLINES
FULL SIZE
14" x 24"

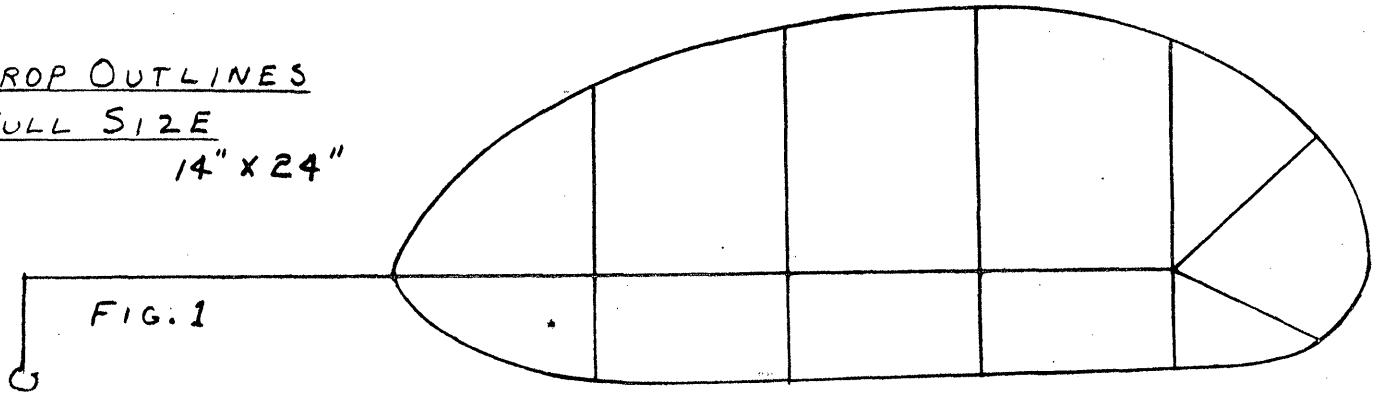


FIG. 1

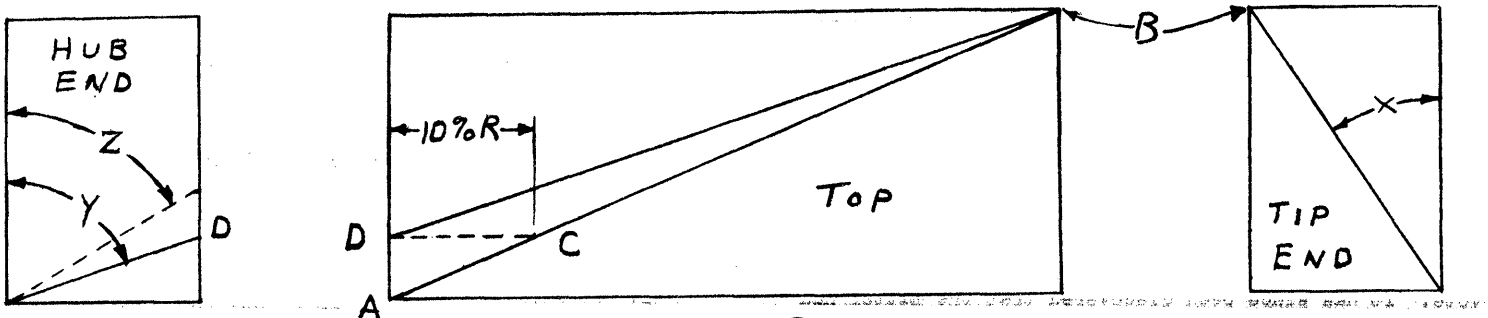


FIGURE 2

15" x 31"
(MODIFIED)

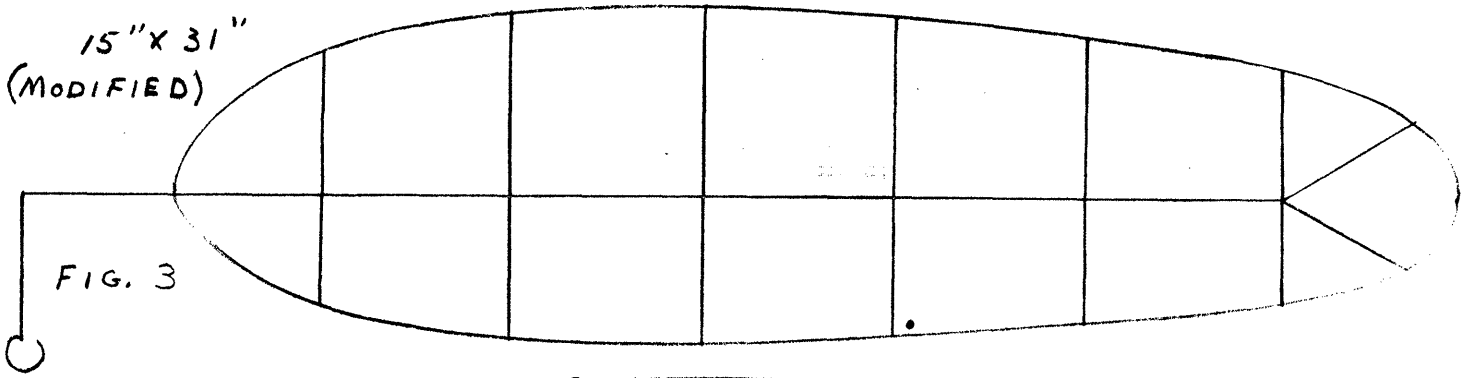


FIG. 3

15" x 28"

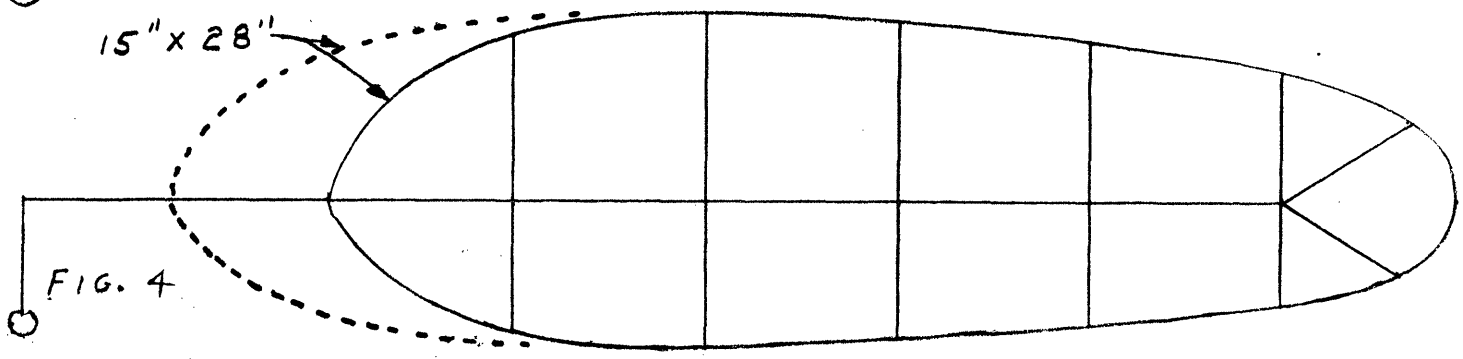


FIG. 4

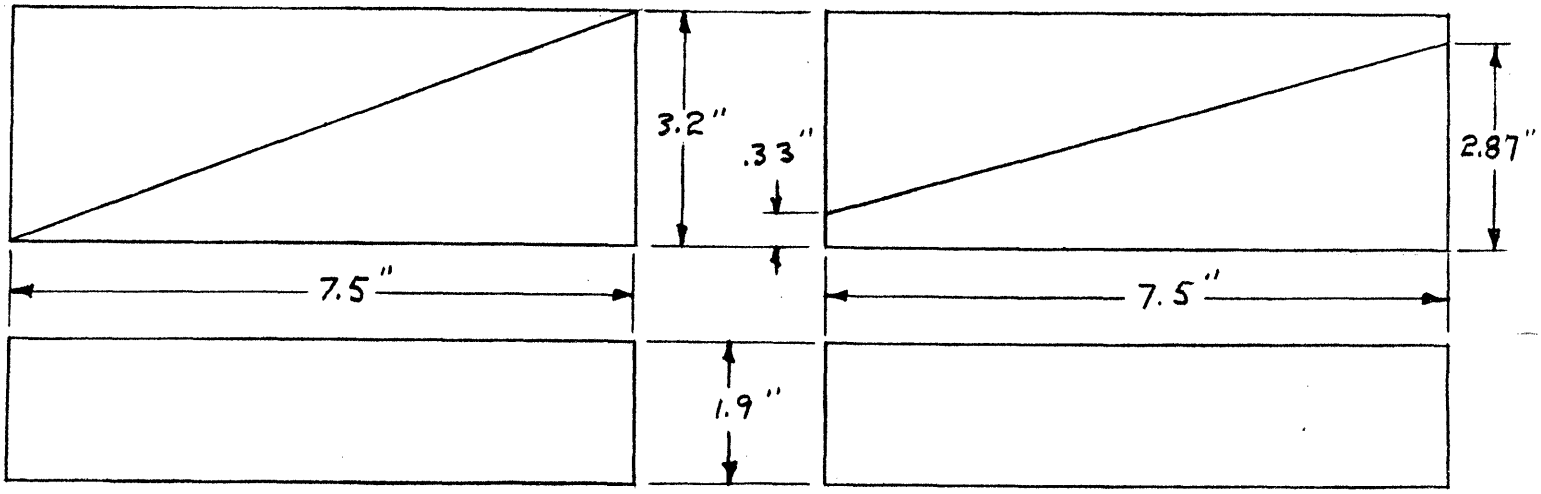


FIG. 5

FIG. 6

as shown in figure 2. For the purposes of this series of tests, it was decided to limit the maximum blade angle to that angle which occurs at 10% of the radius on the conventional prop. This is done as follows: Compute the dimensions of the standard block and lay out the top carving line (line AB) as shown. Measure off 10% of the prop radius to establish point "C" (exaggerated for clarity in the sketch) and project in to the end of the block to establish point "D". The new top carving line is line DB, and a line is also needed from point "D" to the side carving line (bottom of the block). Note that the blade angle at the tip (angle "X" in fig. 2) is unchanged on the new block, but that the angle at 10% of the radius has been reduced from angle "Y" to angle "Z". Note also that the prop shaft will be placed perpendicular to the bottom of the block during construction just as for a normal prop.

A series of props were built to "get the range" and test the characteristics of the new props. As would be expected, the new props behave as if they were of much lower pitch than the standard prop. It will take extensive testing and a whole new approach to rubber sizes to determine the relative efficiency of this new prop design, but some general comments can be made by making certain assumptions as a frame of reference. These assumptions are: All test props equal in weight to avoid CG shifts in the test model, all test flights made with the same number of turns in the same loop of rubber, and preliminary test flights made on each set-up to check model trim.

Under those conditions the prop with reduced hub angle will climb at a higher RPM and for a longer time than the standard prop, while cruise RPM will range from the same to slightly higher on the same torque. Level flight will require less torque than the standard prop, and the ship will deadstick on the same rubber size that is correct for the standard prop. In other words, it seems that the peak torque required to reach a given altitude is less, and it requires less torque to maintain level flight. This leads to the conclusion that the same weight of rubber should be made up from a longer loop of smaller cross-section rubber in order to more nearly match the torque curve required for this prop design.

The prop with reduced hub area seems to exhibit properties quite similar to the standard prop except that climb and cruise RPM's are lower and it seems to use up more of the turns before landing.

The above comments were based on several props built for "B", "C", and "FAI" ships over the past few months, plus three props built especially for this testing program. The basic size chosen was 15" x 28", to be used with a 25" Paper Stick of conventional design weighing .044 oz. less prop. The test weight for all the props was .0086 oz., to match the prop of figure 1. Figure 3 shows the blade outline and rib spacing for the standard prop and for the prop with reduced hub angle, and figure 4 shows the amount of blade area reduction and the outline of the prop with reduced hub area. The standard prop and the one with reduced hub area were built on the same block (figure 5), and a special block was made for the other prop.

Since the modified props behave like low pitch props, an effort was made to more nearly match the props for the test. We elected to make the blade angle at 50% radius equal on the modified and standard props. This raised the tip angle of the modified prop to an angle equal to that of a standard 15" x 31" prop. Figure 6 shows the modified block. We welcome questions, discussion and criticism of this design approach, but our fondest hope is that someone else will independently test this design and check our conclusions. A further report on these props will follow after more testing is completed.

STATE OF THE ART

This month a double-barrelled presentation by George Batuik brings us the current record holding models of two classes - Tom Finch's FAI and Walter Mumper's Paper Stick.

Tom Finch's FAI ship made the first United States flight over 40 minutes which had not been steered with a balloon. (Frank Cummings, holder of several Cat. III records, made a flight of 40:13.2 a few months ago, but failed to steer his model out of the Moffet "jet stream" during the flight.)

Tom says of the flight (41:27): "It was done with a brand new ship with one of the props I made a couple of months ago. The prop was a 20" x 40" with an elliptical outline (see 3-view for dimensions). I ran a 19" loop of .072 rubber that weighed .066 oz. Joe Bilgri wound for the flight and got in 1900 turns. He remarked that it felt pretty tight although he could have gotten in a few more. The flight peaked out at about 25 feet below the girders at about 12 minutes and landed with about 100 turns, never getting close to either the sides or the top of the hangar."

To follow up last month's presentation, we have the next Cat. II paper stick record holder. On March 30 this year Walter Mumper and Charlie Sotich engaged in a see-saw battle for the record. Charlie's best flight was a new mark of 17:25; Walter's last flight of the day went for 17:41.8. At the next Chicago Aeronuts Record Trials on April 27 Walter put the model up again for 18:54.2. Here are the stories of those flights: "With about half an hour left to fly and Charlie Sotich on the winder, 2000 turns were put in the .075 x 18" motor and a total of 160 turns backed off to release some of the initial torque. The motor still felt too powerful, so I held it for 6 or 7 minutes in hope of killing the climb a little. After about 3½ minutes the model climbed to just under the center girders, circling in and out of them and bouncing off various obstructions for several minutes. The model finally dropped out of danger (below the lights) at 12-13 minutes and touched down at 17:41.8."

"The model and prop with which I set the paper stick record on April 27 is exactly the same as the one I used to set the record on March 30. The only difference was the motor which was changed to .070 x 18" Pirelli. With Charlie Sotich on the winder again, 2160 turns were put in and a few turns backed off to reduce the initial torque. The model was launched, and it started to climb slowly for approximately 6½ minutes to an altitude of 60 feet where it leveled out and started to cruise. Then it slowly descended to the floor for 18:54.2."

RECORDS? MAYBE!

RECORD TRIALS - EDWARDS AFB, CALIFORNIA, July 6-7, 1963
Cat. II, 97½' ceiling
Senior B Cabin - 8:26.0, Steve Houlihan
Open B Cabin - 13:01.0, Warren Williams

NEWS FROM AROUND THE WORLD

CALIFORNIA - LANCASTER

The record trials at Edwards AFB, sponsored by the Antelope Valley Tailwinds, netted only two records. The air conditions were pretty turbulent "on top" and there was a fair amount of drift. Most of the fliers went away planning new power combos for the "next" time, however. The 97½' ceiling is near-maximum for Category II, and it is reasonable to expect that many of the Cat. II records now held in the Midwest will move west.

CALIFORNIA - SANTA ANA

The open contest held by the Sky Hoppers of Orange County in Santa Ana resulted in some pretty high times, and an O.O.S. paper stick flight. The times: Stick - 38:47, Bill Atwood; Cabin - 16:18, Warren Williams; Paper Stick - 19:55, Bill Atwood; Easy B - 13:16, Warren Williams; HLG - 1:06, Nat Antonioli.

The O.O.S. paper stick model belonged to Hal Cover, and it "escaped" into the blue when the hangar doors were opened without warning. Normally there is a 45 minute warning, but someone missed this time!

ENGLAND - COVENTRY

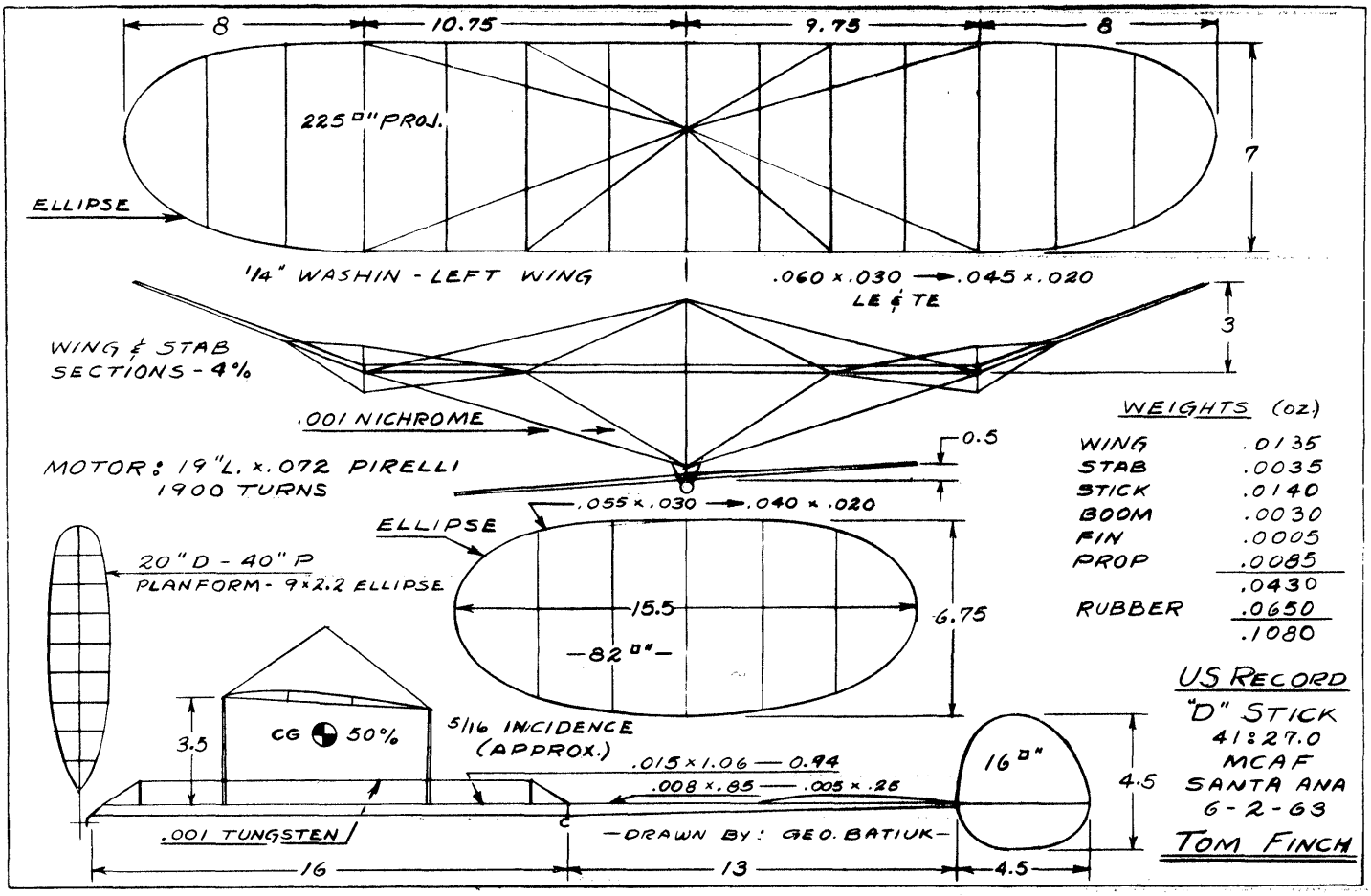
The first indoor session of the year was held on June 15-16 at Cardington. The meeting was blessed with very good attendance, including some newcomers to the sport. Ron Draper turned in the top time of 27:30, followed by Reg Parham with 26:09 and Arthur Barr with 25:04.

NEW YORK - YONKERS

Fred Weitzel, designer of the "Mr. G" autogyro, has turned to indoor scale models. He builds and flies them in his living room; lacking any contests that he can fly in, the models are proxy-flown by Hal Osborne at Santa Ana and Wilmington. His latest, a 1915 Wright model L, won Biplane scale at a recent Santa Ana meet - and that's a long way from workbench to contest!

NEW ZEALAND - UPPER HUTT

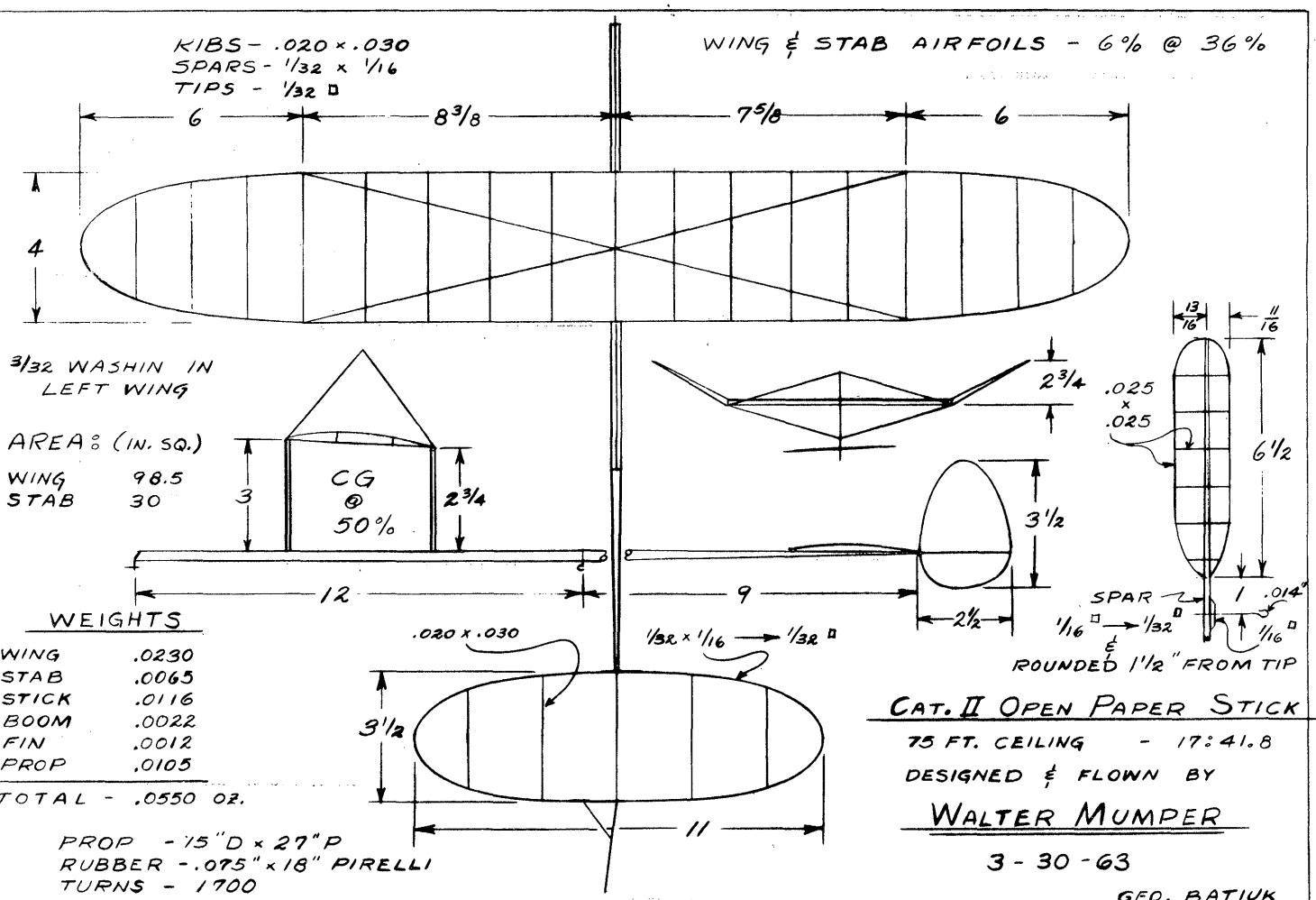
Most of the indoor sessions have been plagued by drift lately - but competition is still rugged. The Wellington MAC Memorial Award, normally won on the basis of outdoor performance, was decided this year by indoor competition after a real close outdoor season. John Malkin won it over Brian Roots, making flights with both an Easy B and his .028 oz. Finch B.



WEIGHTS (oz.)

WING	.0135
STAB	.0035
STICK	.0140
BOOM	.0030
FIN	.0005
PROP	.0085
	.0430
RUBBER	.0650
	.1080

US RECORD
"D" STICK
41:27.0
MCAF
SANTA ANA
6-2-63
TOM FINCH



WEIGHTS

WING	.0230
STAB	.0065
STICK	.0116
BOOM	.0022
FIN	.0012
PROP	.0105

TOTAL - .0550 oz.

PROP - 15"D x 27"P
RUBBER - .075" x 18" PIRELLI
TURNS - 1700

CAT. II OPEN PAPER STICK

75 FT. CEILING - 17:41.8

DESIGNED & FLOWN BY

WALTER MUMPER

3-30-63

GEO. BATIUK

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." AUGUST 1963

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****THE INDOOR NATIONALS****

July 28, 1963

Indoor Stick

Junior

1.	Bob Deshields	17:58.4
2.	David Bristol	11:29.8
3.	Chris Bristol	10:36.3
4.	B. Wisniewski	8:25.9
5.	Tom Smyly	7:13.0

Senior

1.	Steve Houlihan	25:03.0
2.	S. Asklund	20:46.8
3.	Ronnie Young	20:13.6
4.	Chris Peterson	19:24.8
5.	Shaye Diebolt	17:42.0

Open

1.	Dick Kowalski	40:10.6
2.	Bud Romak	39:40.0
3.	Lew Gitlow	37:28.2
4.	Carl Redlin	35:02.9
5.	Charlie Sotich	33:00.0
6.	Manny Andrade	31:39.1
7.	Don Kintzele	31:32.0
8.	Bob Champine	30:44.0
9.	Jim Kagawa	29:27.0
10.	Bill Atwood	29:14.8

Paper Stick

Junior

1.	James Hassad	12:14.0
2.	B. Wisniewski	11:22.2
3.	Bob Deshields	11:15.1
4.	Chris Bristol	10:15.4
5.	Tom Smyly	10:14.8

Senior

1.	Shaye Diebolt	12:39.2
2.	David Erbach	11:38.6
3.	Larry Loucka	9:42.4
4.	Steve Houlihan	8:57.2
5.	Blaine Miller	7:39.8

Open

1.	Bill Atwood	23:22.0
2.	Ed Stoll	23:16.0
3.	Charlie Sotich	19:12.2
4.	Hal Cover	18:40.8
5.	Bob Champine	17:12.0
6.	Bud Tenny	16:27.4
7.	Lou Young	16:19.7
8.	Jody Tenny	15:53.8
9.	Bill Bigge	14:38.0
10.	Jim Kagawa	14:03.2

Indoor Cabin

Junior

1.	Bob Deshields	12:30.8
2.	Tom Smyly	8:55.2
3.	David Bristol	8:35.6

Senior

1.	David Erbach	13:45.0
2.	Steve Houlihan	12:40.4
3.	Shaye Diebolt	10:23.0

Open

1.	Frank Cummings	27:43.5
2.	Joe Bilgri	25:26.2
3.	Lew Gitlow	25:16.0
4.	Bill Atwood	23:22.0
5.	Warren Williams	17:44.1
6.	Charlie Sotich	16:25.0
7.	Bob Champine	15:47.0
8.	Hal Cover	15:12.5
9.	John Diebolt	15:05.0
10.	Bill Bigge	12:36.0

Indoor HLG

Junior

1.	Bob Deshields	1:10.0
2.	W. Vanderbeek	1:02.2
3.	Joe Salatany	:59.0
4.	Tom Smyly	:56.2
5.	Larry Simpson	:53.8

Senior

1.	Robert Deecroft	1:11.5
2.	Bill Blanchard	1:07.0
3.	Ronnie Young	1:05.5
4.	S. Asklund	1:05.2
5.	Larry Loucka	1:02.0

Open

1.	Lee Hines	1:17.6
2.	Curt Stevens	1:13.0
3.	Reid Simpson	1:08.9
4.	Charlie Primbs	1:08.3
5.	A. Zimmerman	1:08.1
6.	Vic Cunningham	1:06.0
7.	Nat Antonioli	1:05.2
8.	Sherwin Moslowe	1:02.6
9.	Gary Phillips	1:02.6
10.	Wilbur Perkins	1:02.1

****FAI INDOOR SEMI-FLYOFF****

		Aug. 2, 1963			Aug. 3, 1963			
		1	2	3	4	5	6	Total
1.	Bill Atwood	35:40	41:26	43:17	00:06	34:24	42:36	85:23*
2.	Bob Champine	9:53	31:02	34:40	41:23	37:37	21:11	79:00
3.	Stan Chilton	0:15	30:50	0:04				31:05
4.	Frank Cummings	35:27	36:25	37:56	33:50	43:28	35:51	81:24*
5.	Tom Finch	17:12	38:08	37:51	11:04	10:13	7:21	75:59
6.	Joe Hindes	31:55	15:45	29:29	14:33	9:01		61:24
7.	Ernie Kopecky	43:42	31:13	9:19	34:08	32:05	32:57	77:50
8.	Dick Kowalski	36:24	15:32	17:17	16:48	21:19	8:01	53:41
9.	Ed Stoll	35:59	38:54	41:11	38:24	41:21		82:32*
10.	John Triolo	23:57	14:49	32:24	34:44	35:01	31:05	69:45

NATS COMMENTARY

To those indoor fliers who are limited to low ceiling sites, and the attendant problems of bouncing off the top and hanging up, a blimp hangar is a tremendous place. When they first walk in, the top is a long way away. By the time they have spent all day trying to get the models somewhere near the top, they know it is a long way up.

When we entered the Nats this year, our hope was to do as well as possible in Stick, and to place in the top ten in Paper Stick. Both Jody and I got the second part, and with the help of Larry Renger we turned in decent times with our mike ships. Larry took us under his wing and proved all over again how important it is to have an interested and dependable helper. Thanks again, Larry!

We didn't really see much of the Indoor Nats (too many East Coast and West Coast fliers take the hangars for granted, but most other fliers get a crack at the big places only every other year) because we took full advantage of the flying opportunity. However, several things

FAI COMMENTARY

Beyond any doubt, the FAI Semi-Flyoff was the most outstanding indoor event ever held in this country - and maybe it was the all-time greatest. In fact, an eighty minute total would have only been fourth place! None of the fliers or timers paid the slightest attention to the 30 minute mark when it came up - the former "standard of performance" has become passe!

Bill Atwood broke the ice with the first official flight around noon on Friday. A free and easy air of "wait and see" had prevailed all morning - but by 4 PM it looked as if it would take more than two 40 minute flights to place. Ernie Kopecky had set a new national record of 43:42 and Bill Atwood was through with his flights, clearly in first place with 84:43. The good air held until after 7 PM, causing Frank Cummings to say, "This is the best I've ever seen it in here." At the end of round one, Bill Atwood still led, followed by Ed Stoll with 80:05 and Tom Finch with 75:59.

"NATS" (cont.)

we did see: Bill Atwood won Paper Stick using a 15 year old carved prop - - -Dave Erbach's 'copter was the first indoor model we saw in the air - - -All the FAI qualifiers took it easy when flying their FAI's in the Nats - - - "Willie" Williams had a real wild Cabin ship - two props, two fuselages and one tail on the left fuselage, with it all held together by the wing and special bracing - - - Bruce Paton's geared Cabin - two motors in an oval stick; the motors wound separately outside the fuselage and then installed in the fuselage with the aid of two long wires, three people and a quiet but urgent prayer.

Speaking of Cabin, this event developed into a real see-saw event between the top contenders. Finally, Frank Cummings put a stop to all the nonsense with an all-out flight - a new record for a beautiful model.

All in all, the Indoor Nats were a very well run contest, thanks to the efforts of Andy Faykun, John Werts, and Herb Shields. There were very few collisions, spectators were well under control, and the gliders and paper stick models were separated into definite flying areas. Thanks also to the Navy for their help with timing and mounds of paperwork - in addition to their regular work. The long day ended quite suitably with a party - movies courtesy of Dick Everett and refreshments courtesy of Irwin and Joan Rodemsky. A real fine way to unwind!

"FAI FLYOFF" (cont.)

Everyone waited until 2:30 on Saturday before making any official flights - the drift in the top was variable and each flight had to count. Bob Champine, bleary eyed and groggy after an all-night repairing session, saw his efforts start to pay off when his fourth flight of 41:23 put him in the running for a team slot. By 4:30, only 8 flights were in and the tension built higher.

Just before 5 PM, Frank Cummings and Ed Stoll were on top - and in trouble. Each had bounced off the beams several times and were drifting into the side. Suddenly the two models drifted together and hung for an agonizing 4 or 5 seconds. At the last possible instant they broke free and settled into safe, well centered patterns! This was Frank's 43:28 flight that put him in second for a while; Ed launched again soon and got 41:21 to move back into second and an almost sure team slot.

At 5:30, Bill Atwood had finished his flights and was in first with 85:23, well out of the reach of anyone but Frank Cummings. Things were getting tight - only 1½ hours to go and there were seventeen flights yet to be made. Six fliers had two attempts left, and Kowalski had three. Dick and Tom Finch found themselves needing well over 40 minutes in order to place - their all-out efforts placed them in the rafters on each attempt. Tom's models hung on 4 out of 6 attempts; Dick scored 5 out of 6.

In the closing hour of the contest, it was still not sure who the team would be. Bill Atwood was in the clear, but neither Frank nor Ed had such a big lead that a last minute effort by Kowalski or Finch could be ruled out. Meanwhile, Bob Champine's fifth flight had put him in fourth and his sixth flight was high and clear, looking like a repeat of his 41:23 flight earlier in the day.

Tom Finch's last two hung, as did Kowalski's fourth. Now Dick's model picked up a side drift just above the catwalk and he had to balloon it. It had 21 minutes, and a successful steering job could put him in the running - but he missed. Then Bob Champine's model hit the drift and headed for the catwalk. One balloon touch, one torn wing tip, and the contest was decided. Kowalski's last flight had to be 45 minutes or better, and once again it hung. The United States FAI Indoor Team was chosen, and the big contest was over.

Even during the tensest moments of the meet, humor cropped up. Someone was teasing Frank Cummings right after the collision, and he retorted, "I was up there first!". Off to the side, Walt Erbach was selling some supplies and Larry Renger paid for his purchase with some coins and a 5¢ stamp. David Erbach, kidding about the stamp, suggested that Larry also owed some green stamps. So Larry promptly laid out 5 green stamps and carried off his merchandise! And, in the relieved moments after the contest, Carl Redlin rushed over to Joe Bilgri, "Joe! Joe! Here's the rubber we needed!" He was waving the remains of a broken retrieving balloon!

After the contest, it was a big relief to sit down to a steak dinner in Tustin - arranged for all the FAI folk by Bruce Paton. The meal and fellowship was a fitting end to a fine contest, and a wonderfully relaxed way to get better acquainted with everyone. One small footnote - If you attended the dinner, did you pay your tab? Bruce is out the price of four dinners and can't be sure who forgot to pay.

A big vote of thanks is due to the Marines at M.C.A.F. Santa Ana for their excellent cooperation in loaning the hangar and helping with spectator control. To all the local fliers and interested people who helped with timing and dozens of other details, thanks again. Finally, if it had not been for Bruce Paton's untiring efforts, the entire West Coast FAI program could have bogged down. Bruce CD'd the Santa Ana elims and the Semi-Flyoff, set up transportation for the Eastern and Central Zone fliers, and even had stand-by lodging for them in case it was needed. Bruce, your efforts in the last six months leave us all in your debt - we thank you.

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

Four new members joined NIMAS in July:

JOE HINDES, R.D. #2, Lowellville, Ohio
GEORGE HONDA, 2905 Wellington Rd., Los Angeles 16, Calif.
GLENN JACKSON, 8294 Wyatt Rd., Brecksville, Ohio
CARL REDLIN, 3726 Canfield Ave., Los Angeles 34, Calif.

NIMAS Meeting?

This year at the Nats there were an unusual number of meetings, in addition to the Nats Executive Council meeting which carried over several days. It was decided that there just wasn't a night to hold a NIMAS meeting, since there were so many conflicts with other meetings, but some unofficial discussions went on.

A NIMAS project for early consideration, suggested by at least two members and approved by the charter members, is an award system for excellence of performance. This would take the form of certificates to be awarded to our membership for flights over 20, 30, and 40 minutes. For example, 20 minutes hasn't been done in Cat. I, and no official flights over 30 have been done in Cat. II. We would welcome comments and suggestions for suggested mi stones worthy of award for each ceiling Category. Mayb glider awards, too??? Tell us how you feel!

NIMAS Indoor Rules Committee

Free Flight Contest Board Chairman Phil Klintworth, with the blessings of John Worth and the AMA Executive Committee, has appointed a committee to review and update the entire indoor rules structure. The committee members are Ray Harlan, Bruce Paton, Ed Stoll and Charlie Sotich, with Bud Tenny as Chairman.

The committee objective is "To review all Indoor AMA Rules and to propose any changes which may be necessary to modernize them to meet present day competitive standards and requirements." (Quotes from Phil's proposal sheet) The committee's scope of action includes a review of existing events to eliminate any which have little or no participation, and to eliminate or combine those where needless overlap or duplication is present. Also under consideration is the development of rules for Easy B and possible adoption of a maximum wing span rule rather than the present area limitations for all classes. At present, it is in order for NIMAS members to make suggestions for the enlightenment of the committee - later each of you will have a chance for further comment via NIMAS Ballot.

Contest Board Action

Since only three members of the Contest Board were at the Nats, there was no meeting held during the Nats. As of August 1, not enough Board members had reported on either of the outstanding rules proposals to have any decision at this time.

A DIFFERENT VIEWPOINT!

Jim Kelly's July Record Trials was a real eye-opener to the people at Edwards AFB, as shown by the following article from the DESERT WINGS, a base newspaper:

The Knothole Kid has stumbled across the sport to top off his "Anthology of Unbelieveable Sports." It's a non-table top activity that makes croquet and bird watching seem strenuous by comparison. It's the only sport in the world in which an enthusiast could have a

mild heart attack at high noon and win the championship before suppertime on the same day. As a matter of fact, this particular sport is like watching grass grow through melting ice cubes.

It's the grand old sport of flying the gossamer, nearly invisible model aircraft lovingly called "mikes" --- short for microfilm --- by the followers.

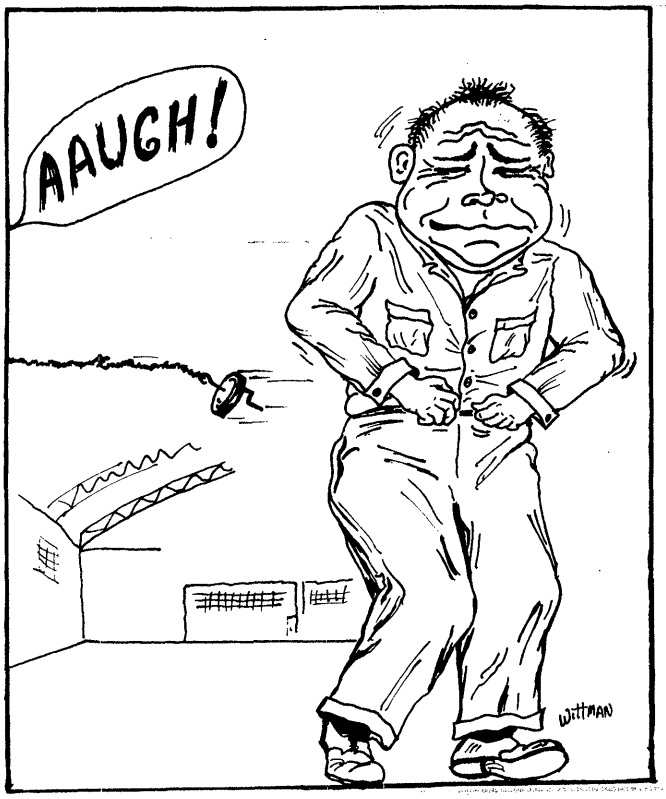
But, boy, do they fly. Ten or twenty minutes is normal. Their owners launch them and then unconcernedly wander outside for a cup of coffee while the Transparent Wonders swim through solid silence up among the rafters.

Last Saturday, the Kid paid a visit to the huge Weight and Balance Hangar down on Contractor's Row where a handful of dedicated hobbyists were setting new records in slow motion.

Squinting around in the gloom upon entering, the Kid finally gave up and whispered "Where's the action." I'm not sure, but I think it ruined a couple of record flights. Somebody pointed up, and there they were, large and wispy, floating around with their props reluctantly beating the air at 50-60 rpm.

The Kid discovered one thing about the sport, though. You need another hobby to fill in the slack periods while the "mike" is airborne.

"THE PERILS OF CHARLIE"



THE PICTURE STORY

Besides all her other titles, Jody has assumed that of Staff Photographer - at least for a while. On page 4 and 5 we have pictures from the FAI Flyoff and the Indoor Nats. Here is the story:

Page 4

1. Upper left - Ernie Kopecky and the new Class D Cat. III record holder. An outstanding flight - 43:42.

2. Upper right - "Mr. Indoor" Bill Atwood and his winning geared FAI ship right after his 43:17 flight. Bill's model was easily the most consistent model at the Flyoff, and was never fully wound.

3. Center left - Bruce Paton (rear) and the United States FAI Indoor Team - (left to right) Bill Atwood, Frank Cummings and Ed Stoll.

4. Center right - Ed Stoll and the second place model.

5. Lower left - Frank Cummings prepares to launch his third place model.

6. Lower right - Bill Bigge winds for Bob Champine. Bob placed fourth, and will serve as alternate if one of the other team members is unable to go.

Page 5

1. Upper left - John Triolo hooks up for an official.

2. Upper right - Dick Everett watches Bob Champine and John Triolo during a tense moment at the Nats.

3. Center left - Ed Stoll winds Dick Kowalski's taut film model.

4. Center right - Joe Hindes assembles a model for test flying. Note the wing mounting jigs in the box - each wing is supported in sockets for maximum protection.

5. Lower left - Frank Cummings winds Tom Finch.

6. Lower right - Stan Chilton hooks up after a wind from Pete Asjes.

Many thanks also to our good friend, Bill Wheat, for helping assemble this picture story - he hand-tailored the printing on about half these pictures.

RECORDS? MAYBE!

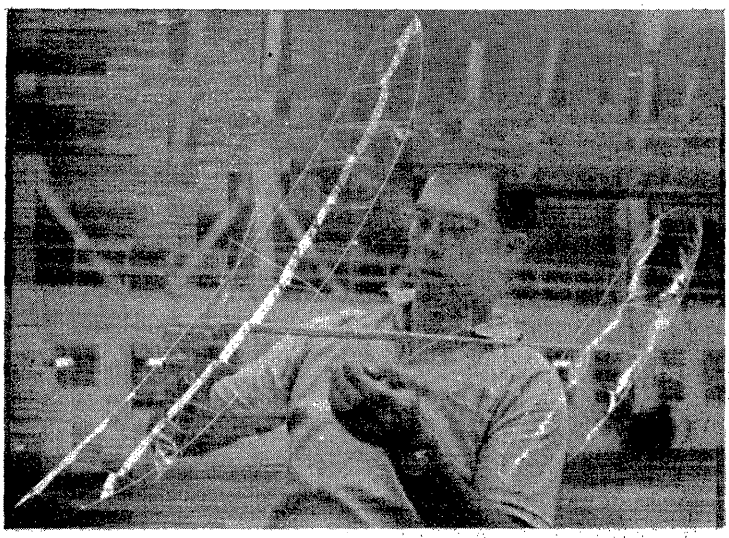
NATIONAL MODEL AIRPLANE CHAMPIONSHIPS - July 28, 1963
Santa Ana, Cat. III, 180' ceiling.
Junior Cabin - 12:30.8, Bob Deshields
Open Cabin - 27:43.5

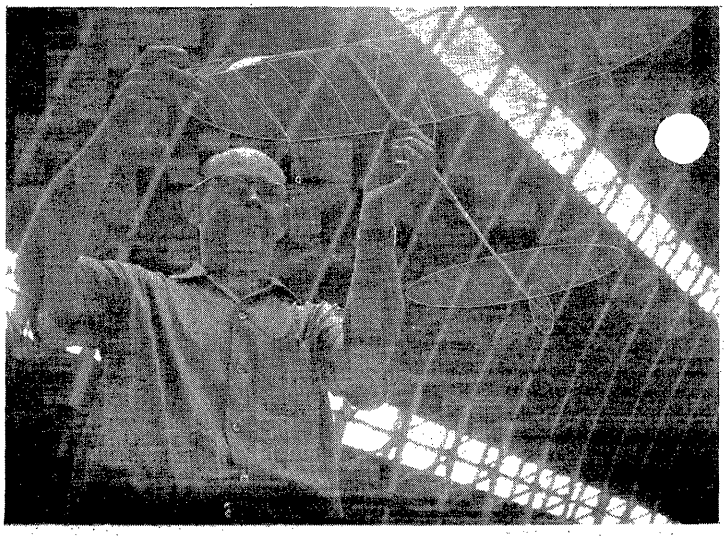
FAI SEMI-FLYOFF - August 2, 1963
Santa Ana, Cat. III, 180' ceiling
Open D Stick - 43:42, Ernie Kopecky

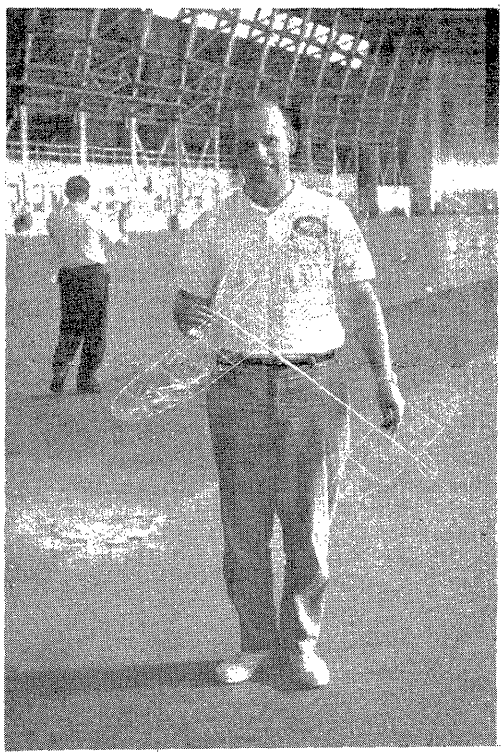
NEWS BRIEFS!

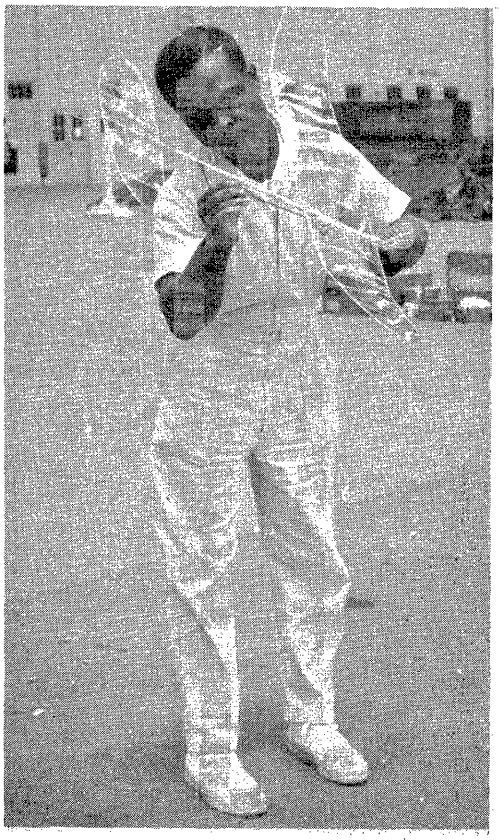
NEW JERSEY - LAKEHURST
Record Trials are scheduled for the following dates in Lakehurst: Aug. 11. Aug. 25, Sept. 8, Oct. 6. Contact C. V. Russo, 143 Willow Way, Clark, New Jersey for info.

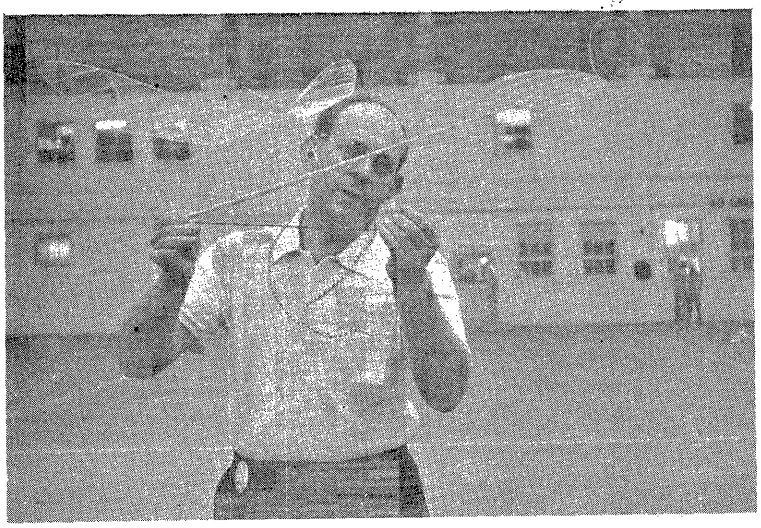
CALIFORNIA - LANCASTER
Jim Kelly is planning another Cat. II record trials in the 98' Weight and Balance Hangar at Edwards AFB sometime in September. Contact Jim at 44246 North Cedar, Lancaster, California for info.

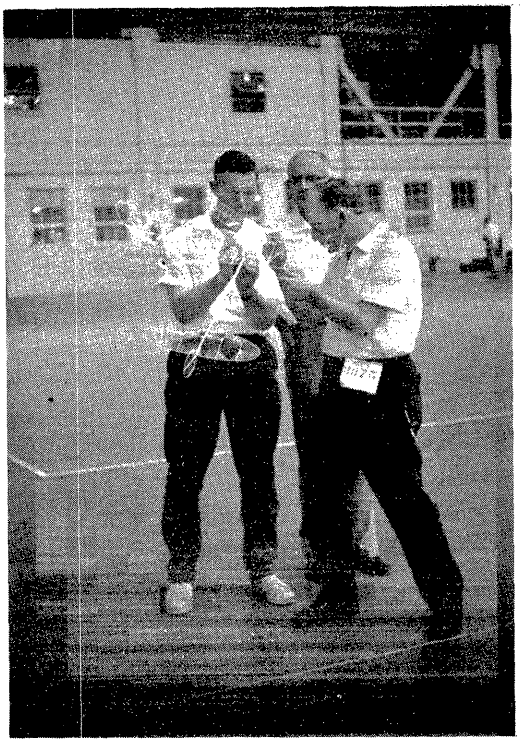


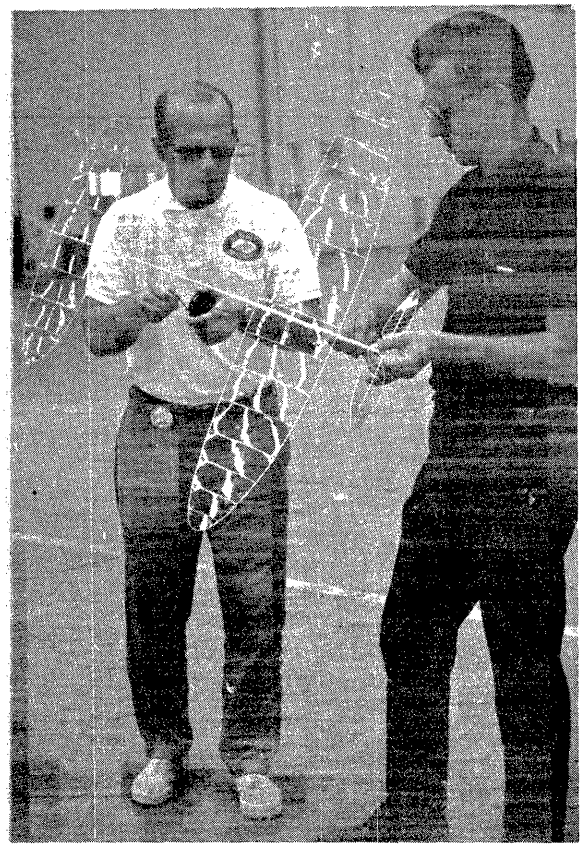


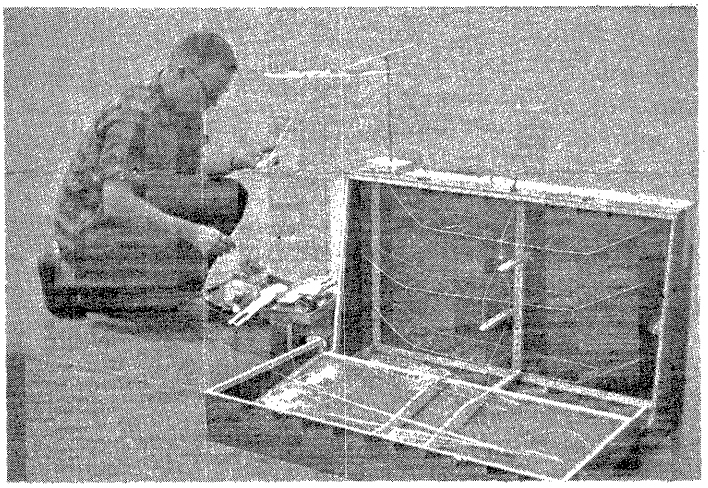


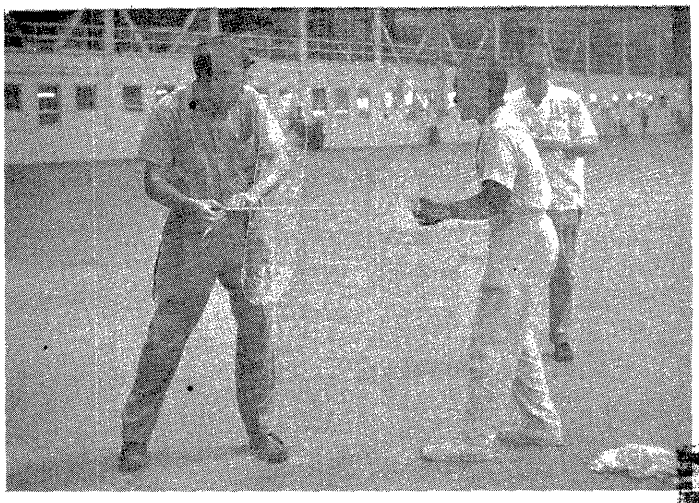












INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." SEPTEMBER 1963

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

The latest NIMAS members are as follows:

STEVE HOULIHAN, 2226 Date Avenue, Alhambra, California
JIM KELLY, 44246 North Cedar, Lancaster, California
NEIL SHIPLEY, 189 Benedict Avenue, Norwalk, Ohio
MARK VALERIUS, 461 Choctaw Trail, Shreveport, Louisiana

NIMAS Rules Committee

There have been a few comments on the proposed indoor rules review, some of which indicate that we should add Easy B and FAI Indoor (FAI Indoor is in the process of being added at this time) to the list of indoor record categories, and not drop any events. Late in 1960 we added, by the creation of Cat. I and Cat. II, 24 new record events for each of three age classes. This was an increase of 200%, and was greatly responsible for the increase of indoor activity we have enjoyed.

Now, pick up your July, 1963 issue of Model Aviation and turn to page five. A simple count of record events shows 36 indoor events and only 28 events for all the other types of models combined! Certainly, indoor flying accounts for less than half of all the total AMA model activity, yet we are asking for a total of 42 events (add FAI and Easy B), which is 50% more events than all other model types combined. Also, none of the outdoor records are more ancient than 1958 and 20% of the outdoor marks were set in 1963. Since all of the Cat. I and Cat. II events didn't exist before 1960, a check of the Cat. III marks shows that 47% of the records were set before 1958 and some have not been bettered in 23 years in spite of better materials and techniques.

It is still very much in order for all NIMAS members to express themselves on this matter - It is apparent to your editor that we need to eliminate or combine some of these events but we of the committee need suggestions and comments on the matter - regardless of where you stand.

NIMAS Awards

One of the two members who suggested awards for 20, 30, and 40 minute flights amplifies his idea with these comments:

1. If the idea has any merit it should be taken simply as milestones of 20 minutes, 30 minutes and 40 minutes without regard to ceiling heights.

2. The young modeler breaking 20 minutes has made a significant plateau in indoor flying. It is the same deal for an older modeler just starting indoor - the same good feeling of accomplishment with 30 minutes as the next goal.

3. The award should be implimented with a fancy certificate and decals and be listed in MODEL AVIATION along with listings of current records, but NIMAS should co-sponsor the award.

4. The system can be expanded to glider flying, perhaps with awards for one minute and one and one-half minutes.

In editorial defense of using ceiling heights as part of the award program, we can say that (for example) a 20 minute flight in any ceiling less than 45' is a tremendous accomplishment, as is 30 minutes in any currently active Cat. II site. Let us hear your comments, please!

Back Issues?

Have you recently joined NIMAS? Do you wish you had back issues of INDOOR NEWS? We have on hand some copies of each issue dating from September 1962 thru the present issue. NIMAS members can receive one each of the back issues for the nominal exhorbitant fee of 25¢ in stamps - for non-members the price is 10¢ per copy. We make this offer on a first come - first served basis, so get your order in early.

Sites!

Thanks to the efforts of several people we have a list of hangars that were built during the time of the dirigibles. How many of these buildings are still in use, and can any of them be used for indoor? Also, the three other sites listed are new buildings that were recently completed or are still under construction. Is anyone looking into the possibility of using these sites for indoor? Admittedly the Canaveral Apollo hangar will probably be out of reach from now on, but we can dream, can't we? How many other stadiums, domes, coliseums and fieldhouses have we overlooked - especially in the Central Zone where we have no active Cat. III sites and no active Cat. II sites with more than 65' of clear flying space.

Site	Length	Width	Height
Akron, Ohio - Goodyear "Zeppelin"	1175	200	325
Lakehurst #5	980	170	258
Lakehurst #1	807	200	262
Scott Field, Belleville, Ill.	800	123	150
Langley Field, Virginia	450	125	125
Cape May, New Jersey - U. S. Navy	708	109	106
Akron, Ohio - Wingfoot Lake	400	95	100
Chatham, Mass. - U. S. Navy	250	66	100
Pensacola, Florida - U. S. Navy	250	66	82
Aberdeen, Maryland - U. S. Army	220	70	70
England - Cardington	812	156	181
Karachi, India (British)	850	170	200
Germany (Friedrichaffen)	775	158	181
Germany (Berlin/Staachen)	587	115	138
France (Orly)	984	178	298
France (Toulon)	770	150	197

University of Chicago - Urbania campus, indoor stadium seating 18,000 with no interior posts or supports.

Houston, Texas - Outdoor sports dome with 202' ceiling, now under construction.

Cape Canaveral - Project Apollo hangar, 524' tall with 674' x 513' floor area. (To be built in 1965)

Some time ago it was decided that NIMAS should act as a clearing house for information on active sites with the idea of compiling a Site Directory. The information to be compiled might include ceiling height, site records and general flying conditions in the site. If the name and address of the club officers and other "contacts" are included, visiting NIMAS members can more easily find the sites and get acquainted with other fliers.

HEY! Looky Here!

Earlier in the year we mentioned that Lew Gitlow was working on a new SKETCHBOCK - and it is about ready. Those of you who saw the first issue will agree that it was well worth the price. Sez Lew:

"The book, Fundamentals of Indoor Models, will be ready by the end of September. It will do a lot to help the Indoor Modeler introduce his hobby to other people without giving up hours of his scarce free time. The emphasis is on sketches, photos, and how to BUILD indoor. Full size plans are included, and it has about 52 pages. The price is $1.50 P.P. anywhere in the world."

FAI INDOOR REPORT

FAI Indoor Rules Change Proposal

On August 30, FAI Indoor Committee Chairman Dick Kowalski learned of the possibility that Great Britain, through the S.M.A.E., may propose that the maximum wing span for FAI Indoor models be reduced to 25.6", or 65 centimeters. It is assumed that this proposal will be on the agenda for the next C.I.A.M. meeting which will be held in October or November.

According to established A.M.A. procedure, the Committee must submit all recommendations to HQ by September 1 of each year. Since he did not have time to consult with the Committee, Kowalski made the recommendation that the proposal be shelved until after the 1964 World Indoor Championships so that there would be time to have study and discussion of the matter prior to establishing the U. S. voting position. This recommendation was made with the provision that any Committee member could veto this stand by direct contact with A.M.A. HQ.

Although there has not been time for further word on this matter, it can be a great help to Frank Ehling to have a consensus of opinions from as many fliers as possible at the time he attends the C.I.A.M. meeting. If all readers of this newsletter will forward comments on the proposal to Dick Kowalski, 20203 Moenart, Detroit 34, Michigan, no later than September 28, it will be a help in establishing a U.S. stand on this issue in case the proposal is acted upon at this meeting.

To the best of our knowledge, Boyd Felstead of Australia first suggested such a change, and it was first published in the December 1962 issue of INDOOR NEWS. That item is reproduced verbatim here:

Change FAI Models?

Boyd Felstead, our member from Australia, injects these comments for our consideration:

"What I feel now, as regards FAI specifications, that the wing span should be reduced to 2/3 the present limit. I am suggesting that the 35.4" projected span be reduced to approximately 24" for several reasons:

1. The smaller size ship would circle tighter with less chance of drift or hangups.

2. The smaller ship is easier to transport, which is important when travel to other countries is involved.

3. With 40 to 45 minute flights, it takes a long time to complete a contest - the Class B (approximately) size should reduce duration to about 30 to 35 minutes.

4. The smaller wing area would present a bigger challenge than we now have.

What do the other NIMAS members think?"

****HAPPY BIRTHDAY!****

The month of September marks the fourth anniversary of the Wilmington Indoor Model Airplane Club. WIMAC is the first and only club devoted exclusively to Indoor - and WIMAC furnished the example which proved that Cat. I and Cat. II flying was a necessary and desirable part of the national model picture. WIMAC has held monthly flying sessions continuously for the four years since it was organized, and each session was a sanctioned Record Trials. Finally, the club supports WIMAC NEWS, the first club newsletter devoted to indoor flying. Dave Copple has served as editor of this fine newsletter since the first, and has worked untiringly to advance the cause of Indoor, not only at Wilmington, but all over the world.

Dave did not stop with the effort of cheering others on, but went on to write the proposal which created Cat. I and Cat. II and hand carried the proposal to Washington to speed its adoption. From this beginning, present day indoor has grown to the presently large and active thing it is today.

It is safe to say that without Dave Copple's encouragement and example INDOOR NEWS would never have been started. It was a proud moment in your editor's life when he recieved Honorary Membership in WIMAC, and an equally proud moment when he was invited to be a Charter Member of NIMAS when Dave was setting up the organization. Many congratulations and best wishes to Dave and WIMAC - where it all started!

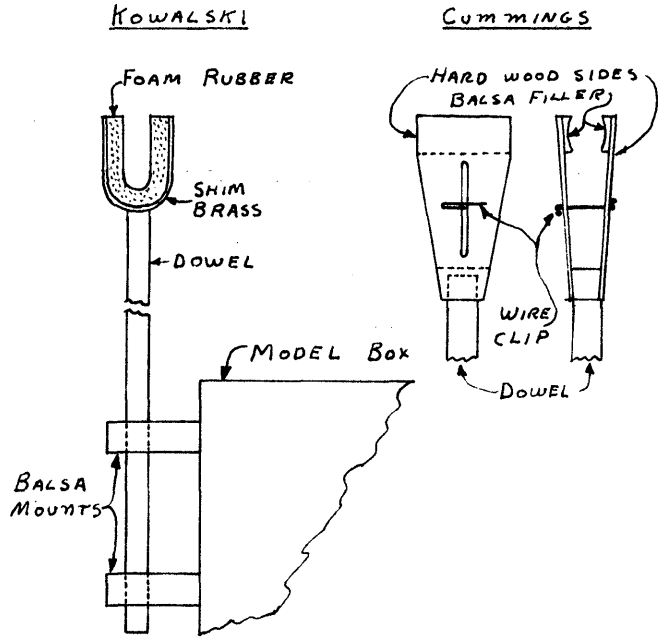
HINTS AND KINKS

Run-Down Stands

A run-down stand is one of those nice little "extras" that most of us never get around to building. However, when you have one, it is a big relief to be able to "hang up" your model while the last few turns run down. Also, the stand is handy to hold the model between flights and while you make minor repairs.

During the recent FAI Flyoff we had opportunity to observe two different run-down stands. Each is adjustable to fit different size motor sticks and neither takes long to make. In the sketch below, Dick Kowalski's stand is shown on the left. The model "gripper" consists of a "U" shaped bracket fastened on top of a dowel and lined with foam rubber. The bracket can be squeezed together until it fits the motor stick snugly enough to hold the model in place. At the other end, any convenient method of mounting to the box or a heavy base is fine.

On the right, Frank Cummings' stand is constructed so that it opens wider than necessary and is closed by means of a wire clip which is slid up to tighten the clamp "just right" on the fuselage.



RECORDS? MAYBE!

CHICAGO AERONUTS RECORD TRIALS - MADISON STREET ARMORY
August 24, 1963, Category II - 75' ceiling
Senior B Cabin - 11:31.8, Dave Erbach
Senior C Cabin - 12:15.6, Dave Erbach

LAKEHURST RECORD TRIALS, Lakehurst, N. J. - 170' ceiling
August 11, 1963
Cat. III Senior Helicopter - 6:14.0, Edmund Smith
August 25, 1963
Cat. III Senior Autogyro - 5:22.9, Edmund Smith

PROP FORUM

The July prop discussion raised a few questions and comments - and it also reminded us that the things many of us take for granted aren't always common knowledge or fully understood. The major question which arose was on prop blocks - their design and use. The standard block, used for construction of mono-spar props, is designed with the following formula:

$$1.\ PITCH = \frac{3.14 \times DIAMETER \times THICKNESS}{WIDTH}$$

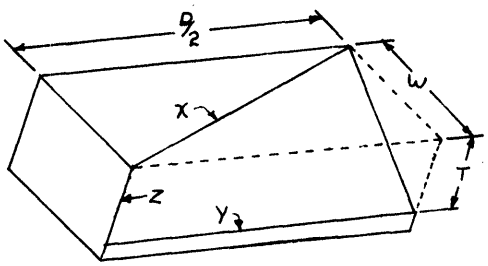
Refer to the sketch of the block below. The dimensions as marked on the block are fairly self-explanatory, but we shall make a sample calculation "for example." A typical Class B prop would be 14" diameter and 26" pitch. Careful planning at this stage can eliminate some extra work in the future. Is there a possibility that you will want a 16" x 26" some time in the future? The same block can be used for all sizes of props from 12" x 26" through 17" x 26", but the 12" and the 17" props are not likely to be needed in a 26" pitch.

The next consideration (also planning ahead) will be the basic block size. A block 2" x 2" x 8" will make a fairly good size, except that it will be crowded if you plan a blade width much more than 1.1". A better choice would be a 3" x 2" x 8" - this will allow plenty of room for blade shape experimenting.

With this choice in mind, let's design the 26" block. For practical reasons let's use the full width of wood available. Formula 1 can be re-arranged thus:

2. THICKNESS = $\frac{\text{DESIRED PITCH} \times \text{WIDTH}}{3.14 \times \text{DIAMETER}}$

Put in 3" for width and 16" for diameter and solve for thickness. This comes out to 1.55" - so mark these dimensions on the block and draw lines "x" and "y" to use as guide lines while carving the block. Take your time make the building surface as smooth and flat as you - use a straight edge between lines "x" and "y" to check on your progress. Be careful to preserve the edge of the block (edge "z") so you can line up the prop shaft with it during construction. Draw a blade outline on the block, and you're in business.



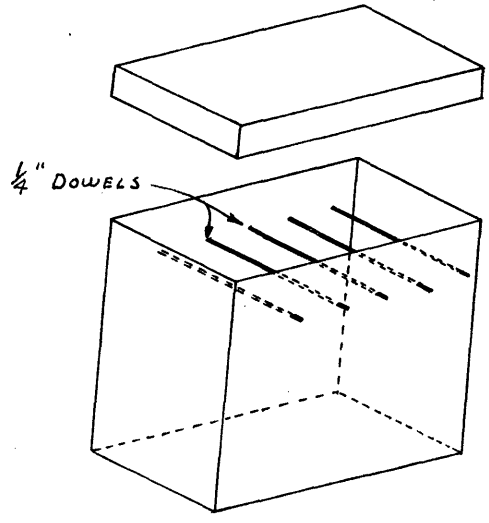
QUESTIONS AND ANSWERS

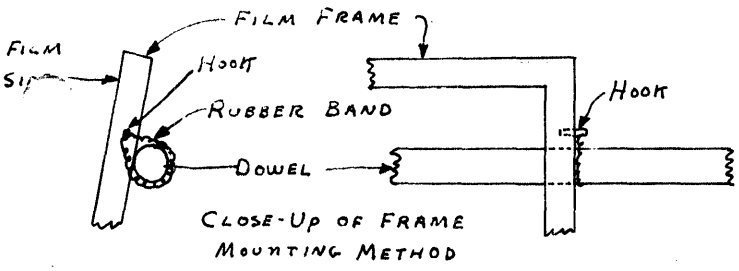
27. How can microfilm be stored and transported?

Those fortunate enough to have a spare closet to hang their spare hoops of film are rather scarce, and another way to store film is needed. We solved our problem with a large box such as is sketched below. The first thing needed is a tight-fitting lid which serves two purposes. Of course, the lid keeps dust and bugs out (provided the rest of the box is also air-tight), but it also makes the box more rigid - an important factor in moving the box without damaging the film.

After creating a strong and air-tight box, install a row of dowels across the box and glue them in with Elmer's Glue or a similar glue. Each film frame will need two hooks near the top, located so that a rubber band around the dowel and through the hook will pull the hoop against the dowel and also exert a downward pressure on the hoop. s pressure holds the bottom of the hoop in place on bottom of the box and prevents the hoop from flop- ng around when the box is moved.

Since it requires at least one hand in the box and between hoops to manipulate the rubber bands, the dowels must be spaced about 6" apart to leave room. If the box is wide enough to leave handling room on both sides of each hoop, the dowels can be spaced a little closer together.





NEWS FROM AROUND THE WORLD

CALIFORNIA - MOFFET

Record trials have been scheduled for Hangar #1 at Moffet on September 15. Once again, this one may be the last, since Lockheed is expected to take over the hangar in the near future.

CALIFORNIA - WILMINGTON

September 13 marks the date for the Easy B Annual and the regular bi-monthly indoor scale meet, all to be held by the Wilmington Indoor Model Airplane Club. A unique feature of the Easy B contest is that you can enter as many models as you like in both the Tissue event and the regular Easy B event, and make as many flights as you can find timers for! Trophies through third place and a special high time Tissue trophy are at stake.

ILLINOIS - CHICAGO

The Chicago Aeronuts held indoor Record Trials on August 24, and a miminum of 10 fliers showed up - four from out of town! It appears that the out-of-towners appreciate the Armory more than the Aeronuts. Too bad some of the people down South don't have a site to neglect! Maybe the attendance will be better at the RT's scheduled for October, November and December. Contact Pete Sotich, 3851 W. 62nd. St., Chicago for details.

INDIANA - KOKOMO

Chuck Borneman reports that they hope to start their indoor season in October this year and run through April, pending arrangements with Bunker Hill AFB. This is their fourth consecutive year, and the activity is about as good as anyplace in the Central Zone. Contact Chuck at 1401 West Taylor, Kokomo, Indiana.

NEW JERSEY - LAKEHURST

In addition to making all the arrangements for use of the hangars at Lakehurst, C. V. Russo has been keeping everyone informed with a one-page news sheet. Manny Radoff is emerging as one of the most consistent fliers of those nearby. However, high time for recent sessions has been made by Bob Champine, who faces a 600 mile round trip each time. Bob is working on those important small details to improve the models - and a new prop gave him 36:12 with less than full winds the last time out.

NEW YORK - ELMIRA

The Elmira Indoor Model Airplane Club is one of the most active indoor clubs we've heard of. During the summer months they often managed three flying sessions a week, with activity concentrating on Easy B and HLG. To get in on a good deal, contact Jim Mayes, 413 Sharr Avenue, Elmira, New York.

NEW ZEALAND

Jack Eriksen reported on one of the wildest indoor sessions we've heard of to date. The session was staged in Hamilton, New Zealand as a part of an agriculture show. The flying site was the display hall, during the main part of the display. Jack managed high time of 3:50 with 16" tissue model, in spite of the turbulence caused by about 2000 people milling around the floor! The Hamilton Club has ulterior motives in staging this display - they get the hall free and all to themselves one other time during the year.

OHIO - CLEVELAND

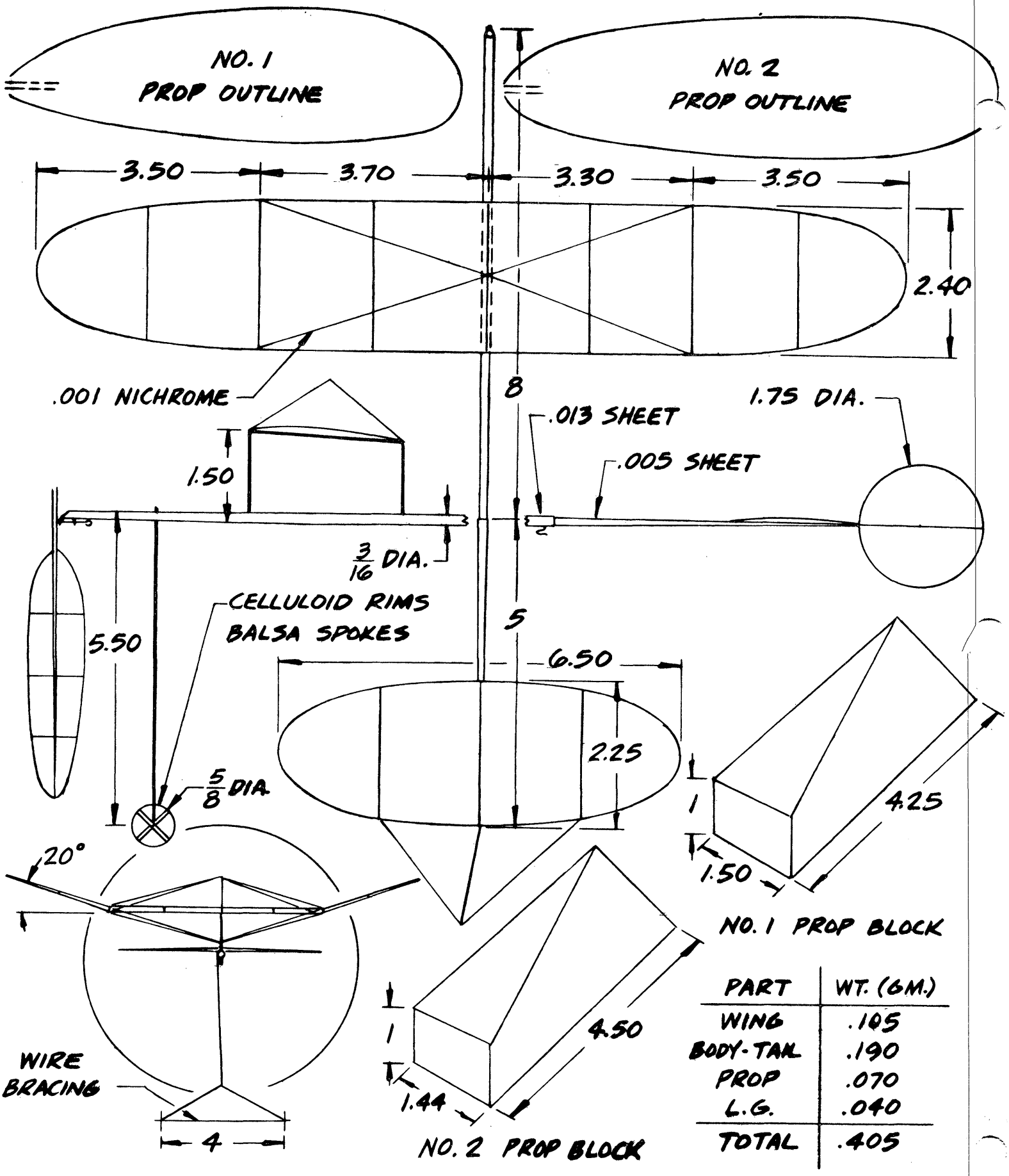
Chuck Tracy reports that the Baldwin-Wallace College field house will be the site which replaces the Armory they lost in the summer of 1962. The ceiling is not as high, but it is still a pretty good site according to Chuck. Advance planning for the Great Lakes Indoor Air meet indicates the date will probably be Dec. 29 or Jan. 5, and the site will be the Public Auditorium as usual.

STATE OF THE ART

A little over a year ago Larry Renger built "Bazz Fazz II" and set the Cat. I Sr. ROG record at the August 1962 WIMAC Record Trials. When Larry went back for his senior year at M. I. T., Bazz Fazz went along. When the Tech Model Aircrafters held their November Record Trials, Bazz Fazz did it again - this time in Cat. II. For some time, both records stood thus:

Cat. I Sr. A ROG - 8:16.9, Aug. 14, 1962
Cat. II Sr. A ROG - 8:46.8, Nov. 17, 1962

At this time the Cat. I record still stands, but Dave Erbach upped the Cat. II A ROG record to 9:01.2 on March 30, 1963.



PART	WT. (GM.)
WING	.105
BODY-TAIL	.190
PROP	.070
L.G.	.040
TOTAL	.405

"BAZZ FAZZ II"

DESIGNED BY LARRY RENGER

Printed by
The Cleveland Press

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." OCTOBER 1963

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

Contest Board Action

In a memo dated September 10, 1963, Free Flight CB Chairman Phil Klintworth reported on the recent ballot covering the Detroit-Chicago-Wilmington IHLG proposal. The vote was seven "for," one "against," and three members failed to vote. This vote qualifies the proposal to be printed in Model Aviation, which will start the three-month study period. A final vote will be taken early in 1964.

NIMAS Rules Committee

At this time the Committee has not completed their initial study of the rules, so there are no recommendations from the Committee. However, we have received several letters suggesting that events be combined or eliminated. The most drastic suggestion went like this: "One stick microfilm event and it should be FAI rules, one cabin event limited by wingspan, one simpler event such as "Easy B" with tissue covering, Baby ROG, and one HL glider (all balsa) event. Helicopter and autogyro should be retained for the real experimenter."

Several people have suggested that classes be designated in terms of maximum span rather than maximum area, and at least one person suggested that flight scoring be changed to the best two of six attempts (same as FAI scoring). Two people have suggested that indoor scale be added as an event, but no one who regularly flies this event has seconded the request. Just for the record, the proper method to request an event is to make the request through the Contest Board member for your AMA district. However, since the Rules Committee exists, it is OK to send a copy of the request to the Committee Chairman.

We thank those who have taken the time to make these suggestions, but it is very easy to assume that most of you care very little about what happens! If you do care, drop us a line at Box 545, Richardson, Texas and make yourself heard. One area in particular where the committee can use some help is with rules for an Easy B event. Each area where these models are flown uses a different set of rules - and the final result is the same each place. Everyone flies Easy B and has fun regardless of the rules. The simplest rules specify an all-balsa prop, maximum span 18" and maximum chord 3"; the most elaborate rules specify that all outlines must be straight lines, all components solid, no bracing of any kind anywhere, prop blades to be sheet balsa (no carved props), covering optional, 18" maximum span, 3" maximum chord, 54 square inches maximum wing area, maximum stab area 27 square inches or 50% of the wing area. To date, we simply haven't heard any good reasons for more than the simplest of rules for Easy B. The floor is open to anyone who would be good enough to defend the Wilmington Easy B rules - if you really think them necessary!

DRAFTSMEN WANTED!!

Several times in the past we have made this plea - and everyone has enjoyed the plans turned out by our several volunteers. However, it is time that we add a few more draftsmen to our staff - it is hardly fair to have the same people do all the work! In some cases all that will be required is to make a tracing from an existing plan; in some cases a whole plate will have to be organized from a sketch. So, step right up, folks! The line forms to the right!

OOPS!!

Last month we announced that Lew Gitlow's fine new book "Fundamentals of Indoor Models" would be ready by the last of September. We failed to give Lew's address, never dreaming the books would be ordered from us! Order your copy from: Lew Gitlow, P. O. Box 65774, Los Angeles 65, California. The price is $1.50 postage paid anywhere in the world.

FAI INDOOR REPORT

Since we just finished selecting the 1964 FAI team, it would seem out of place to open a discussion of future team selection programs. Not so! We have probably selected the strongest possible team, considering the number of fliers we started with. Unless time (and the World Championship) proves us wrong, we had an excellent plan for team selection this year. The main thing that was lacking was that we failed to develop many new fliers. A recent letter outlined an interesting program that we can think about. We continue to improve the performance of the models - but let's not forget the team selection.

The program proposal is this:

1. A series of four sessions starting in March and ending in June. (Why not a longer time spread? Anyone who has just gone through the recent series of three elims will know why! Ed.)

2. Any qualified entrant can enter any or all sessions, in any zone.

3. The top three two-flight totals from any session are the target for the next elim, and the top three winners from the fourth session are zone reps at a Nats flyoff.

The letter went on to outline some thoughts for and against this proposal. For:

1. Losers can continue to develop their models and skill at successive sessions rather than be shut out early in the game.

2. The top times will be boosted at each session as the experience of individual fliers grows. Previous winners will have to keep improving to stay on top, but a team slot will still be available until the fourth session.

3. Less experienced fliers have the opportunity to try their increasing skill against the winners over several sessions, and the top fliers can practice sportsmanship by helping the neophytes improve their skill. The two groups will mix more and get better acquainted.

4. Increased activity will increase revenue and interest in the event.

Points against the proposal:

1. More sessions with increased participation will make administration and site availability difficult.

2. Some fliers may wait for the last session at their own risk. Since consistent performance is needed for a strong team, it might be well to require entry in at least one elim before the zone final.

3. Fliers who live far from a site will have an extra burden of cost and time. However, sites could alternate or rotate within the zone.

Comments, anyone???

65 Cm. FAI Span?

Dick Kowalski reports that the FAI Indoor Committee is split on the issue, with two in favor of the 65 cm. and three favoring no change. Dick's mail has been 3-1 in favor of 90 cm., while the mail at INAV has been 3-1 in favor of 65 cm. and local comments have been 6-0 in favor of 65 cm. Meanwhile, in England their Indoor Committee is split over the issue, as are the less experienced fliers. In a more official vein, Frank Ehling has asked the pertinent sub-committee to shelve the issue until next year, and present indications are that this will be done. Time will tell what the outcome will be, but it appears that no change will be made until after the World Championships next summer.

Cardington Closed?

In the past few months it has been rumored that the R.A.F. was giving up the base at Cardington, which left the future status of the hangar in doubt. Although the R.A.F. is leaving, it appears that the hangar will still be available for use. It is also considered likely that Great Britain will host the Championships again, so the site will most likely be Cardington.

Team Manager Nominations

At the present time three people have been nominated for the post of Team Manager to our FAI Indoor Team: Joe Bilgri, Bruce Paton and Dick Kowalski. So far, it seems that a lot of serious thought and consideration is going into the selection of a manager, which is as it should be. This post is far too important to be filled with the winner of a popularity contest (it hasn't happened, but it could) and the man chosen should be the best we can find.

Off-Season Elims

INDOOR NEWS has been asked to try to find out how much interest there is in having a round of FAI Elims in the years when the elims aren't "for real". If you are interested in having a round of elims in 1964, please let Dick Kowalski know how you feel. One advantage to such a scheme would be to try out new team selection methods; another would be the additional development in models and technique which would result from extra competition. Dick's address: 20203 Moenart, Detroit 34, Michigan.

GLIDE TESTING

In recent months there has been additional emphasis on achieving the minimum rate of sink for indoor rubber models. A thorough glide testing program performed both "before" and "after" is one of the most accurate methods of evaluating changes in trim and changes in aerodynamic configuration of your model. Dick Kowalski recommends this method:

1. Carefully balance your model, substituting a weight for the prop and the motor.
2. Carefully check and record incidence settings, C. G. location and any other data which may be helpful.
3. Establish an altitude marker at least 2' high of such a nature that you can easily determine if the model has passed the marker at the right altitude.
4. Glide the model from at least 6' behind the altitude marker so the model will have time to achieve normal glide speed.
5. The model should pass within a couple of inches of the altitude marker. Do not count any glides that exceed this distance from the marker.
6. Time the duration of the glide from the instant the model passes the marker until you can see and hear the model strike the floor.
7. Divide the average duration into the marker height to get sinking speed in ft./sec. Use a minimum of 10 glides for each setting for best accuracy.

LOW CEILING FORUM

Some time ago this column was initiated at the request of a low ceiling flier who asked for suggestions on how to improve model performance in the sites with the lower ceilings. To date, only Lee Hines has passed on any tips for low ceiling fliers - and that was glider information.

The major problem faced by low ceiling fliers is a combination of drift and of hanging up. Quite often, if the site has a smooth ceiling, the drift pushes the model across the ceiling until it strikes a wall or some other obstruction and the timing ends with a hung model. On the other hand, quite a few sites have a lattice-work of rafters and "junk" in the top which effectively prevents ceiling scrubbing and often just plain snags the model. In this type of ceiling one must avoid the beams for two reasons: 1. The model will almost always hang up, and this is more likely if the model is still climbing fast when it reaches the beams. 2. "Ricochet drift" (drift caused by collisions with obstacles) can soon force the model against the wall or into a corner.

The conventional way to fly models under these conditions is to use rubber at least equal in weight to that of the model, with a moderately large diameter prop which flares a considerable amount in order to absorb the power burst and slow the climb. To further slow the rate of climb, the motor is wound to some number of turns less than maximum (as determined by experiment), then all or most of the peak power is "backed off" (again the number of turns backed off is determined by experiment) so that the model operates on the flat portion of the torque curve.

Recently, it occurred to me that a more efficient use of the rubber could be made. Why carry enough rubber to reach the top of a blimp hangar (with prop to match), and then wind it up part way and back off a few? Might it be possible to find a combination of rubber and prop that would permit the entire torque curve to be used? After two months of experimenting, it seems likely that such a combination can be worked out. Until it has been worked out, with special models designed to increase the possible advantages of this approach, we can only guess at the final results.

One early approximation used an 11" all-balsa prop and a 14" loop of .045" pirelli on a paper stick model. With 90% of maximum turns the model had a very rapid climb to the ceiling (28 seconds to reach 20' from a launch 6" off the floor). When it reached the ceiling both wing tips started dragging heavily on the ceiling, which nullified the turn - and the model headed for the wall. It was relaunched without adding more turns and it climbed to 18' in 2½ minutes, landing deadstick at 7:05. The same prop and rubber combination on a FAI model gave similar results, which lead to the conclusion that the prop could be larger.

Later, with a 14" prop and a 13" loop of .045 pirelli (no slack) wound to 1050 turns, the same FAI ship turned 7:40 and landed with 50 turns. The flight took just over 2½ minutes to peak out just under the ceiling and it landed without touching either the ceiling or the walls. Now, 7:40 isn't exactly startling time, even for a 20' site, but neither the model nor the prop were as efficient as they might be. There was fairly strong drift near the ceiling, which had less effect on the model than normal, since it spent very little time next to the top.

This mode of operation is simpler to understand if the prop and motor are considered to be a specific energy input, such as for outdoor FF when the engine develops a certain horsepower for a given period of time. The FF model is adjusted to handle this power input and its performance is evaluated in terms of this input. In a similar fashion, the rubber motor wound to a given number of turns represents a given energy input. The height of the peak torque will govern how high the model can climb and the remaining energy will determine how long the cruise will last, if the model will land deadstick or nearly so.

If this approach will work, it will result in the development of models keyed specifically to a given ceiling height, just as hand launch gliders have been developed for the ceiling under which they are flown. For example, Lee Hines' Sweepette 16 Mk. III, which flew for 37 seconds in Cat. I, would not benefit greatly from an additional 10' of ceiling height - it just isn't strong enough to be thrown higher!

My best guess about the design of these Cat. I models, based on the experiments described above, is as follows: Since the models will not be called upon to bang around on the ceiling, the wings can be about as light as you can handle. The models will have to be designed for minimum rate of sink during the cruise, which will probably include a long tail moment arm and center of gravity as far back as possible and still retain adequate stability.

The motor stick will probably come in for the biggest change. The motor will still be fairly large in cross-section to maintain cruise power, which means a shorter than normal loop. In order to have some slack, the stick will need to be somewhat shorter. The shorter stick can be smaller in diameter, so the weight saving in the stick will be substantial. Such a model, if it proves to be practical, will be capable of pushing Cat. I times up to 20 minutes or more, while 30 minutes in Cat. II could become fairly commonplace. However, the "ultimate" Cat. I model just won't turn some fabulous time in Cat. II because the motor stick wouldn't hold the higher energy motor required to take full advantage of the higher ceiling.

The foregoing prediction is really extrapolation from performance that is largely speculative. If this article causes anyone to speculate about a different way of doing things, to make some effort to turn the peculiar limitations of Cat. I into some sort of asset, or in any way to increase the efficiency and performance of our models, then it will have been worth while. On the other hand, if you disagree with what has been said, the floor is yours! Have your say, and we all may learn something!

CLIMB CONTROL VIA TORQUE TRIM TAB

by Richard Miller

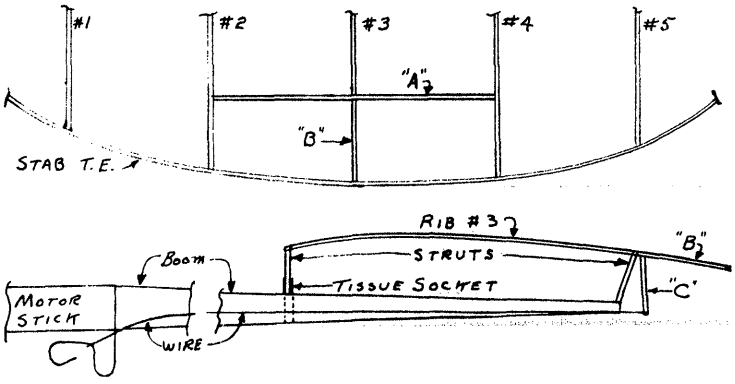
There is scarcely an indoor model that will not outclimb the ceiling under which it's flown - no matter how high the roof; and the lower the ceiling the more onerous the problem. Even with flare props under the highest ceiling it is usually necessary to sacrifice valuable winds in order not to get hung up. This is illustrated by the way in which Carl Redlin let winds run off before his official flights at Cardington in 1962.

Perhaps, in time, gears will put a stop to this. In the meantime not everybody has gears (as a matter of fact only a very few people have gears) and the rest of the people are going to have to shift as best they can. Now whilethey're shifting they might try changing from one incidence setting to another - as a means of getting around the too early meeting of the model and the ceiling. If you have this problem why not try a method of climb control (in addition to a flare prop) designed to keep the model at lower altitudes for a longer period of time and thus increase total duration?

As I watched the low-ceiling set struggling with the too rapid climb my mind went back to the old method of controlling rubber speed models (there was an event!) by bringing the tension of the tightly wound rubber motor, via a small lever, against the rudder post to achieve rudder offset when torque was at its highest. Why not, I thought, adapt the same idea to the fast climbing indoor model? Why not use the tension of the tightly wound motor to control incidence and thus the rate of climb?

Now the first thing everybody's going to say is that it's a gimmick and the second thing everybody's going to say is that the bowed motor stick already does what I have in mind. Well, it may be a gimmick, but gears are a gimmick too - and you may have to beg, borrow, or steal a set to stay in the running in a year or so. As for the bowed motor stick, this is a sometimes phenomenon and very difficult to control because of the very small bits of deflection necessary to make it effective. A much greater degree of control can be had by using a smaller area and a wider range of movement. Like a trim tab.

The device (untested as yet) should be fairly obvious from the drawings, but for those who want to experiment, a word or two might help. If I were doing it I would make a bench set-up and test various hooks with a loop of rubber the size I expected to use on the ship in question. I would vary the drop and diameter of the bends of the rear hook until I had a fair degree of forward and rearward motion - perhaps 1/8" or even more. I would then determine at what percentage of winds the hook returned to a more or less normal position. This action I would transmit to the stabilizer via a length of nichrome or something similar.



To build the stab, put in all the ribs except #3, then add crosspiece "A" and possibly a couple of diagonals. "A" is going to support the rear end of the stab, and the trailing edge between ribs #2 and #4 should be thin enough to have a proper degree of springiness. Rib #3, when added, might profitably be a compression rib.

With the stab finished and covered, add the little V-shaped piece comprised of "B" and "C". "B" is glued to the trailing edge and to the covering but not to the end of rib #3 against which it butts. Now glue the line from the rear hook to the end of "C".

When a fully wound motor is put on the hook it should be quite powerful enough to depress the stab trailing edge (if it's thin enough) and when the hook returns to a normal position the trailing edge should have enough resiliency to resume its original shape. If there is any tendency for the paper to impede action, trim away a little between piece "B" and rib #3. And if it works - but then why shouldn't it?

-30-

NEWS FROM AROUND THE WORLD

CALIFORNIA - MOFFET

The September session didn't have quite as many in attendance as usual, but the times were quite good. Bud Romak topped 39 minutes in stick, Joe Bilgri turned 25:53 in cabin and Manny Andrade turned 21:58 in cabin.

Another record trials has been set up for October 20, and as usual those who plan to attend must notify Bilgri 10 days in advance. Joe's address: 1255 Blackfield Dr., Santa Clara, California.

CALIFORNIA - WILMINGTON

News has been pretty scarce from Wilmington in past months, but we have partial results from the Easy B Annual. Wally Miller, designer of the Easy B, won first place with 9:25; Larry Renger won second place with 8:49. Larry was flying the same Easy B that he used to set the Sr. B Stick record a year ago!

ENGLAND - CARDINGTON

An indoor session at Cardington in September was very well attended, and the fliers were rewarded with low drift and slightly cool conditions. Stan Ward and Ron Draper each topped 29 minutes for the two best flights of the session.

ILLINOIS - CHICAGO

Pete Sotich reports that a Cat. II record trials has been scheduled for Saturday, October 26, in the Madison Street Armory. Since local participation has been poor, it is possible that some contest event may be held to increase attendance. Check with Pete at 3851 W. 62nd Place, Chicago 29, Illinois, for further details.

INDIANA - KOKOMO

Chuck Borneman reports that final arrangements have been made for use of the Bunker Hill AFB gym on the third Sunday of each month from October through April. The first session falls on October 20 and will feature Easy B and HLG events. Chuck has asked that all fliers make suggestions about any other events that they want to be held. If you need further information or have a suggestion, Chuck's address is 1401 W. Taylor, Kokomo, Indiana. Since this is their fourth year of steadily increasing activity, this ought to be a good season.

MICHIGAN - DETROIT

Although the teen dances have stopped, the Michigan State Fair Coliseum still has the false ceiling and the fancy trim. Late rumor has it that it is coming down soon, and the Balsa Bugs plan a record trials if the building is cleaned up in time before cold weather.

NEW ZEALAND - UPPER HUTT

John Malkin and Brian Root travelled to Palmerston for a Cat. II session last month, and managed to cram a lot of flying into the day. Brian's best time was 9:37.6 with a Bilgri "Ditto", which John managed to top later with 11:06.3 for a club record. In the meantime John had been busy setting some other records:

Cat. I Helicopter - 0:49.7 (11' ceiling)
Cat. II Helicopter - 4:02.3
Microfilm Stick Under 18" HL - 6:47
Microfilm Stick Under 18" ROG - 5:58.4

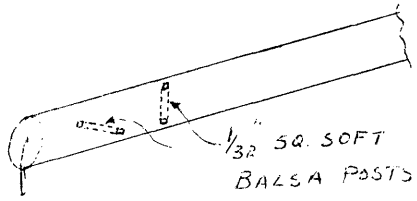
The amazing thing about all of John's record flights except the helicopter flights is that they were all made with the same model - an 18" model with detachable wheels and extra tips which were glued on to increase the span!

NEW YORK - ELMIRA

The Elmira Indoor Model Airplane Club is still growing - now the membership totals 16 members who are quite active in HLG and Easy B. Their top HLG time in their 20' site is 0:23.6 - quite respectable time! If they can locate an adult sponsor for their group, they hope to hold a club contest soon. Volunteers, anyone??

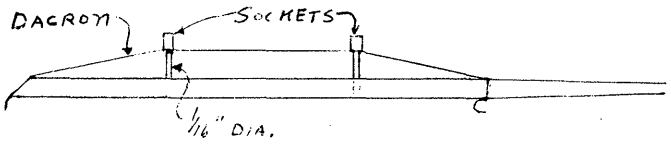
HINTS AND KINKS

The Detroit Balsa Bugs continue to develop model structures, and this development goes along nicely with the monowire fuselage bracing. Sometimes the lighter fuselages have a bad habit of dimpling or oilcanning at points of stress. A soft 1/32" strut across the stick as shown below will hold the wood in shape and prevent the failure with very little added weight.



Another monowire bracing scheme is suggested by Bruce Paton and sketched below. Bruce says, "We've been using dacron for the bracing - the type sold by Cox for their ready-to-fly control lines. The line splits into three strands, we use one of these strands for the bracing. We've found that on an FAI job, if we bow the stick up 1/16" when installing the dacron, that with full winds we get a slight amount of downthrust.

Incidentally, each of these strands is comprised of about a dozen monofilaments. If you have good eyesight, these monofilaments make very good tail bracing or even wing bracing on an A ROG."



RECORDS? MAYBE!

There were some record trials held in September, but we haven't received reports of any record applications. Does this mean no records were set, or simply that there were no reports?

CHANGE OF PACE

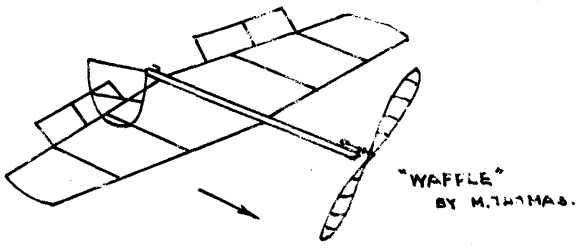
Although we have no classes for flying wings (or tailless models) these strange birds should make interesting fun projects. The author, Reg Parham, needs no introduction to most indoor fliers - he has been well known for years in the field.

INDOOR TAILLESS

by Reg Parham

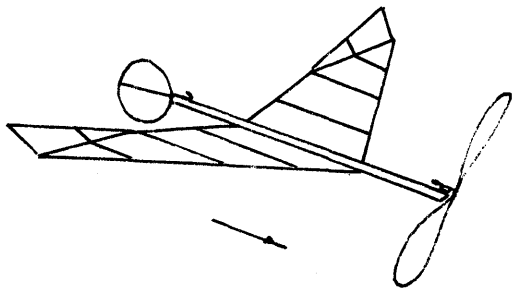
The flying wing type of indoor model is sadly neglected even here in England where there is a record class for it. This is surprising as it is a useful model to fly when a site is cluttered with hanging lights and other impediments. A ship with a swept back wing and a pusher propellor is quite reluctant to hang up.

My interest in tailless started way back in 1950 when I discovered that the British record for the class stood at just over a minute. The model, designed by Mike Thomas, was a curious affair of 18" span similar to that shown in the sketch below:



Mike favored a flat plate section wing, a straight leading edge and a swept forward trailing edge. A tractor propellor was employed and the model was flown in tight right hand circles.

After making a model to this configuration and convincing myself that it was not the answer to the tailless problem I made a small swept back model using a flat plate wing section thus:

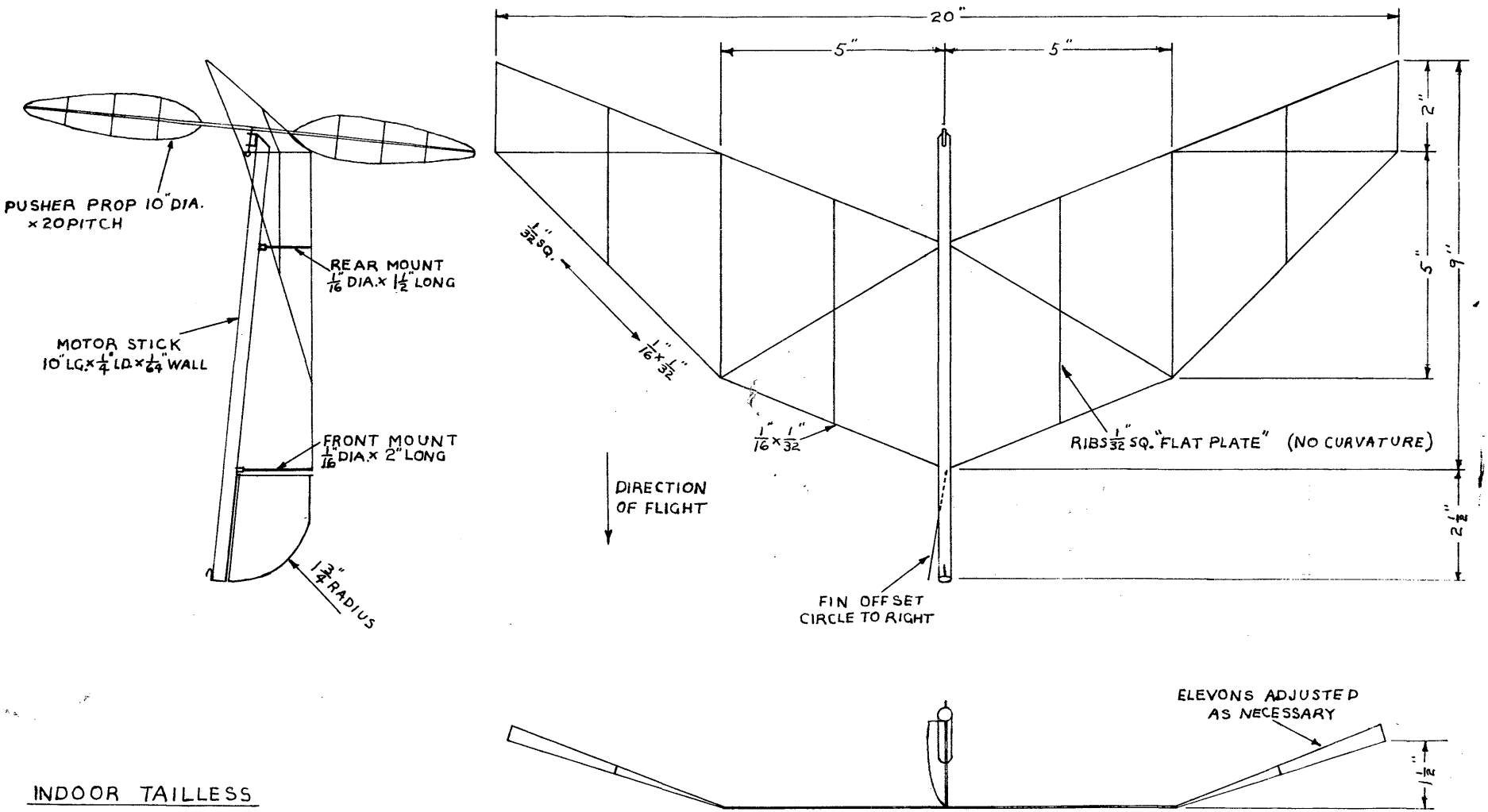


Its cruise was reasonable, but trouble arose in the form of stalling under full power. This was partially overcome by raising the thrust line and mounting the wing well below the motor stick. However, the solution to all the stability troubles came completely by accident. I was experimenting with the model one evening trying to improve its trim and at the same time listening to the big fight on the radio. The fight gained my prior attention and in my excitement I mishandled the model and the wing came adrift from the stick.

With my mind elsewhere I re-cemented the wing in position, but in reverse. Being in a mood to try anything, I wound up in reverse so that the prop had become a pusher and launched the model. To my amazement, it flew perfectly without stall or mush. Needless to say, the prop was quickly reversed on its spindle and "Viola," a stable flying wing. A cambered airfoil was tried later, but its center of pressure movement resulted in instability and so the flat plate airfoil was retained. The forward fin was rather prone to damage and so it was eventually tucked under the motorstick as shown.

For consistent performance it is necessary to build a stiff wing. This is readily apparent from the fact that the elevons produce a twisting moment. Assuming the use of a conventional right hand propellor, a right turn is desirable and the elevons are adjusted for longitudinal trim and bank as necessary.

My plan shows the latest version of the series which was made several years ago. The current British record of 5:14 is held by "Mac" Grimmet with a model of similar configuration, but I see no reason why this time should not be raised to 10 minutes plus in the near future.



INDOOR TAILLESS

BY REG PARHAM
MALVERN, ENGLAND

NOTE THE WING MUST BE TORSIONALLY RIGID BRACE, IF NECESSARY.

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." NOVEMBER 1963

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

The following members joined NIMAS in October:

GEORGE BATIUK, 3066 South Osceola, Denver 19, Colorado
DAVID LINSTRUM, V-3 Jardine Terrace, Manhattan, Kansas

Sponsored Junior Memberships

In February, 1963, the Sponsored Junior Membership fund was announced - and in short order the fund built up to 14 memberships. To date we have only two Sponsored Juniors - largely due to a lack of nominations. Recently it came to light that some clubs had nominees, but the clubs did not meet the original requirement which said the club must be an AMA Chapter or Chartered Club. This restriction has been lifted, and deserving juniors from any club are welcome. In addition, any NIMAS member can nominate a deserving junior - in fact, both our present members were so nominated. In each case, the nominee was an active model builder who got started in indoor more or less by himself and was nominated after being observed in action.

This is the way the business works: Send the name of the nominee to: Bud Tenny, Box 545, Richardson, Texas along with biographical information of the nominee. The nominee pays $1 and the rest of the membership fee comes from the fund. Each club is limited to one membership per year unless they wish to make a donation to the fund. The membership is good for one year, and the junior may renew as a regular member.

Zippy Code

We wonder just what this Zip Code is all about, since the mail seems to get delivered without it! However, it may come to pass that it will be a necessity - if you happen to remember, send it along. By the way, the Zip Code for Box 545, Richardson, Texas is 75081.

NIMAS Awards

So far, the only people to comment on the proposed NIMAS achievement awards have been those who thought of them in the first place. It seems a shame that no one appears to be interested - since there just isn't any kind of recognition available for those who devote extra effort toward improving their models and technique. Some will say that our system of national records does just that - and in a sense they are correct. However, many of the records have been pushed to the point where it takes a happy combination of a good model, excellent conditions and luck to exceed them. This is especially true in Category I, where all the stick records are beginning to creak from old age. It's a pretty fair accomplishment to have a model miss hanging up and miss collisions for 12 minutes, let alone 14 or 15 it would take for a new national record. In fact, Cat. I flights over 11 minutes are pretty rare, and anyone who manages it has done well.

We offer this possibility as food for thought: Set up three awards called (for example) Silver, Gold and Diamond. The Diamond award could be won by a 15 minute flight in Cat. I, 30 minutes in Cat. II or 42 minutes in Cat. III. On the other end of the scale, the Silver award could stand for 11 minutes in Cat. I, 20 minutes in Cat. II, and 30 minutes in Cat. III. A similar award for HLG could be based on time/ceiling height, or rate of sink. Let's have your comments, please!

Financial Report

This issue marks the second anniversary of INDOOR NEWS AND VIEWS under the subscription system. Income for this year from subscriptions and memberships totals $435, with an additional $24 in the Sponsored Junior Membership fund. The expenses for twelve issues are as follows:

Printing costs	$292.72
Postage (newsletter only)	123.88
	$416.50

In addition to the costs above, postage for correspondence totalled $45.07, and office supplies came to more than $25. The postal rates increase alone accounts for over $20 of the newsletter postage!

Incoming mail this year amounted to 700 letters, and your editor sent out over 720 pieces of mail. All in all this has been a most successful year for INDOOR NEWS, and very pleasing to the staff.

This report would not be complete without a word of thanks for all those who helped with a myriad of details during the year. The masthead says "Voice of NIMAS," and this is truly a group publication - thanks to all of you!

Indoor Rules Committee

It is interesting to note how the mail comments are shaping up on the subject of indoor rubber events. These events are leading the list in number of times they are mentioned as desirable: A ROG, B Paper Stick, Helicopter, and Autogyro. All comments have favored adding FAI to the list, with a split between those favoring FAI as the only stick event and those who wish to retain at least one other stick event. Everyone except one has favored adding Easy B, and about half have favored retaining Ornithopter. Several people have favored changing from area to wingspan to determine model class.

As chairman of the committee and as a CD, it is in order to express my rules philosophy - what a set of rules ought to be. I believe that rules which define a class or type of model airplane ought to contain no more prohibitions or restrictions than is necessary to maintain the essential character of the event. All such prohibitions must be stated simply and without ambiguity, so that both builders and CD's will interpret the rules alike. Finally, the essential contest equipment should be held to a minimum, and should be of such nature as to be readily available or easily constructed. Thus, I feel that any restriction which requires many words to define would be better left out - even if this resulted in not having the event. As an example, let us consider part of the Solid Stick proposal which was defeated recently by the FF Contest Board:

"All components must be solid. No tubes, I-beams, H-beams, L-beams, or similar, or built-up, built-up hollow, or hollow construction of components is permitted in any form."

Thus, if "component" is taken to mean any individual piece of the model, wing sockets as we know them are specifically prohibited. In a strict interpretation, it is doubtful that the normal thrust bearing and rear hook could be allowed, since the fuselage is no longer a solid piece, but has been built up from balsa and metal! If "component" is taken to mean sub-assemblies such as wing and stab, the model would have to resemble the A-J Hornet except that the fuselage could not be slotted to receive the tail surfaces!

Admittedly, I have taken an extreme viewpoint to show my meaning - but that same proposal had a basic fallacy in concept. It was proposed with the intent of creating a "beginner" or "novice" event. In the first place, it is impossible to create an event which novices or beginners will win, unless more experienced builders are kept from entering the event. Conversely, if a "novice" wins such an event against "experts", he is, by practical definition, an "expert" regardless of his experience level.

Thus, since the Committee has been asked to investigate the addition of a new event - a "beginner" event, the only possible meaning is to create an event that beginners will be encouraged to enter. After all, a "full house" FAI is a quite formidible looking machine, especially to the uninitiated - and the average paper covered Easy B looks easy enough that few will admit they couldn't build one, especially if you have a rugged "loaner" for them to fly a few times to get them hooked!

FAI INDOOR REPORT

Last month another scheme for FAI elims was aired in this column. The main feature of the proposal was that all fliers could enter each elim until the Semi-Final, and thus could build up their skill or overcome a bad early showing. Lew Gitlow has made these comments on the proposal:

"Let's face it, many things can come up to make it impossible to make one of the flyoffs and a guy can be left with a real hurt. The new plan would prevent this. I feel all the advantages were well put - but I think the last flyoff should allow greater participation. This could be worked out in many ways. For example, average out the sums of the two highest times for each of three or four sessions, say six or 8 flights. Then, take the top 40% or some arbitrary percentage depending upon participation and allow these guys to fly in the last round. I would think that consistency should be paramount. In this way, conditions and other variables would average out and the flyoffs could be held through the entire year, from Fall to Spring with time between sessions for experimentation. The luck element and Point 2 against the presented proposal would be largely eliminated."

65 Cm. Span FAI?

Here are some more comments for and against any possible change in the FAI indoor formula. Bill Bigge has always opposed the change, and offers these comments:

"If the span is reduced, the ultimate models will be harder to build, harder to handle, more subject to ground turbulence, harder to balloon safely (or at all), and harder to see and identify. They will fly about 90% as long, or more, depending upon Reynolds Number effects. As Boyd Felstead says, it would be more of a challenge. Easier transport is the greatest advantage as far as I am concerned. One advantage in the small size that I have not seen mentioned elsewhere is that collisions should be less frequent, by a factor of two. This is not of great importance in most cases in the sense that not many flights are lost by collision, but if you consider that the fear of collisions is an important factor in how many are willing to fly at once, it should make a better contest."

More comments against: The class is established, so why change? The season is complete, and records have been established. Much theory and development has been invested in this size and the resulting Reynolds numbers. The idea that these smaller proposed models will take less airspace is nonsense; we will fly to any ceiling height regardless what size the airplane is. The smaller span will hang as well as any other size, perhaps more readily. It has smaller size and will nestle among truss bracing and other architectural details where the larger span may not be able to go.

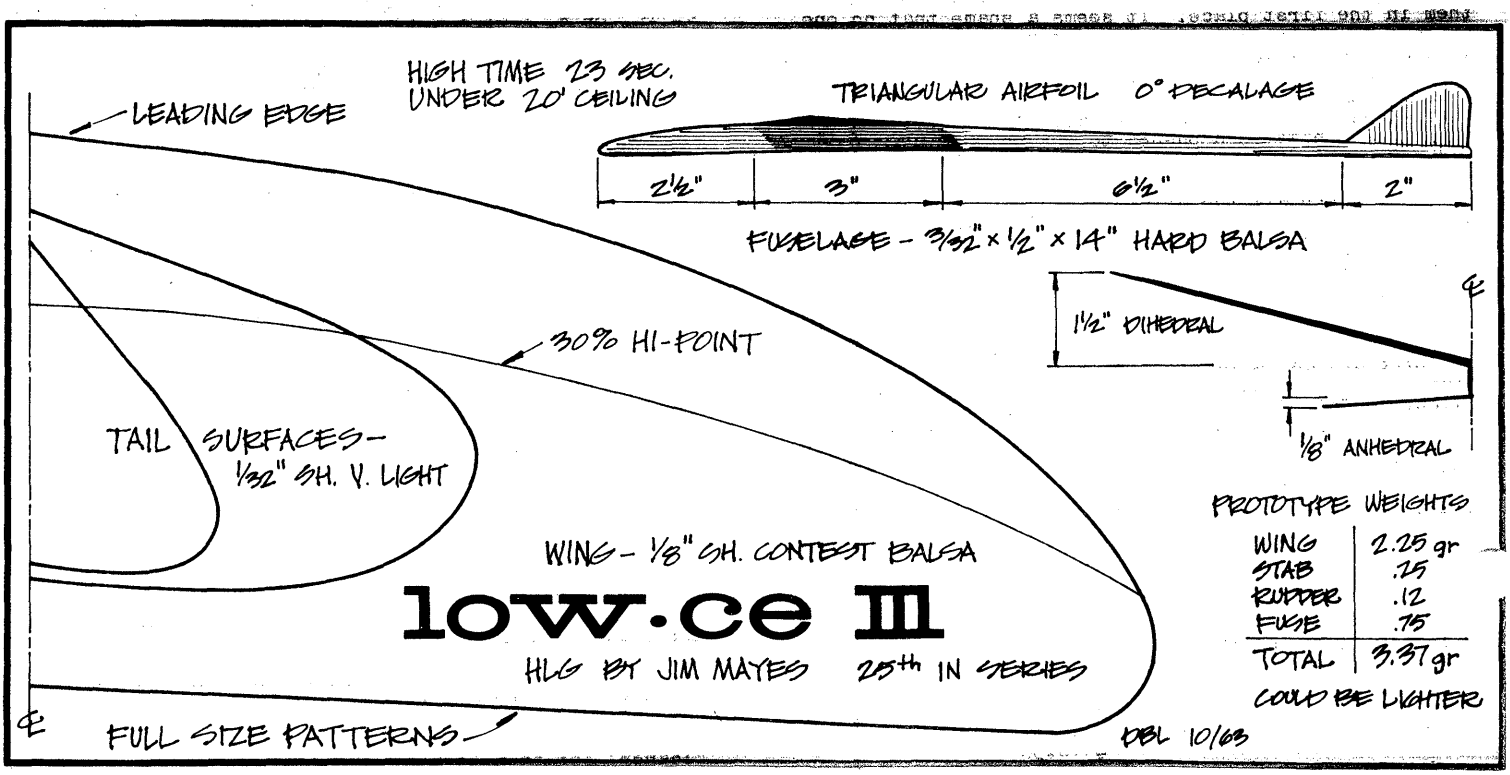
IT'S BALLOT TIME

By the time you read this, it will be almost too late for you to return your AMA ballot. By now, you should have carefully read the brief bibliographies of the nominees from your district (pages 7,8 & 9 in the October 1963 Model Aviation), discussed the merits of each candidate with your fellow AMA members (unless you live outside an active area) and returned your ballot. If you fail to return your ballot, as many do, you have nothing to gripe about if the officers you didn't elect aren't to your liking. Remember, the deadline is November 15!

As usual, there is a space provided on the mailer to renew your license for 1964. If you don't have the cash, mail the ballot anyway. It is not mandatory that you renew before January 1, 1964 - this just helps you to avoid the rush which always occurs early in January. Contest Directors almost have to renew early, especially if they plan a January contest - the first thing that is checked on a sanction application is to see if the CD has a valid license.

Some members who haven't read Model Aviation closely in recent months may be in for a shock when they note the new license rates in effect for 1964. Do not be dismayed at the increase - it is long overdue and more nearly a realistic figure for the services provided by AMA. If you doubt that statement, check the rates for membership in any other professional, sporting or recreation organization which provides any service to the membership at all. It costs several times that amount just to belong to the YMCA!

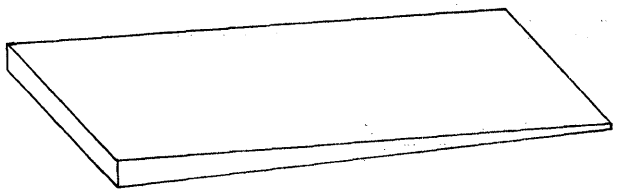
Something new has been added also - something we have advocated for some time and wholeheartedly approve. This "something new" is the FAI Sporting Stamp which must be affixed to your AMA license in order for you to participate in FAI activities. It will cost you $1 at the ti you buy your 1964 license, or $1.25 if you buy it later. This is not a tax as such, but a means for everyone to support FAI with more than their mouth. Prior to this time, only the fliers who actually qualified for a team position had to buy them. That is about as silly as paying your entry fee to the Indianapolis 500 during the last ten laps! So, buy your stamp early and declare your intent - it would be a bargain at twice the price. This last, incidentally, is not a paid political announcement but a statement of personal opinion.



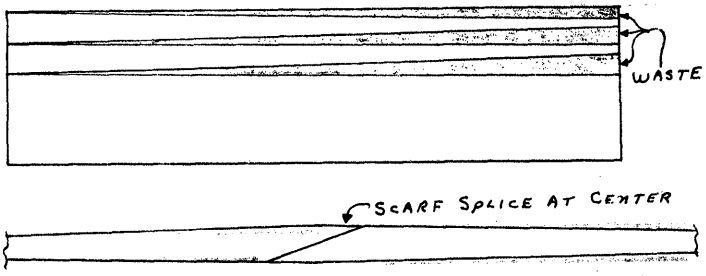
HINTS AND KINKS

Prop Spars Revisited

Some time ago we suggested a quick method for tapering prop spars before they are rounded. Tom Finch and Eric Greenwell have pointed out that the traditional way to taper spars is with a knife and straightedge as shown below. First, the stock is tapered the desired amount:



Now, the stock is tapered with a cut like the first shaded portion shown below; then one tapered half-spar is cut. The process is repeated as often as necessary until you have enough pieces to build your props. Each pair of half-spars is joined carefully with a scarf splice and permitted to dry. Finally, each spar is finished off as usual and the prop completed.



Ceiling And Visibility Unlimited

Well, not quite! However, we sometimes find such tasks as assembly of small parts and the trauma of wing bracing is hampered by lack of visibility. John Triolo suggests that the difficulty can be lessened by proper choice of background color. For example, bracing or assembly of white balsa pieces can be tiring against a white background - and almost a snap with a dark background. It is likely that a careful application of this principle can improve your workmanship also.

THE LAB

In the February 1963 issue of INDOOR NEWS we brought out the desirability of standard tests to determine the quality of our building materials, and suggested tests for microfilm. Bill Bigge developed equipment to measure thickness of microfilm as an aid to uniformity for his own models, and developed a color scale as a guide to help identify film thickness.

The color scale is based on superposition and on angle measurements and the thickness indicated is for light reflected at right angles to the film. The angle at which the color changes to the next thinner color can be rather accurately determined. Assigning a ratio of thickness to this angle requires a value of the index of refraction, μ.

$$1. \quad \frac{\text{APPARENT THICKNESS AT } \alpha^\circ}{\text{APPARENT THICKNESS AT } 0^\circ} = \sqrt{1 - \frac{\sin^2 \alpha}{\mu^2}}$$

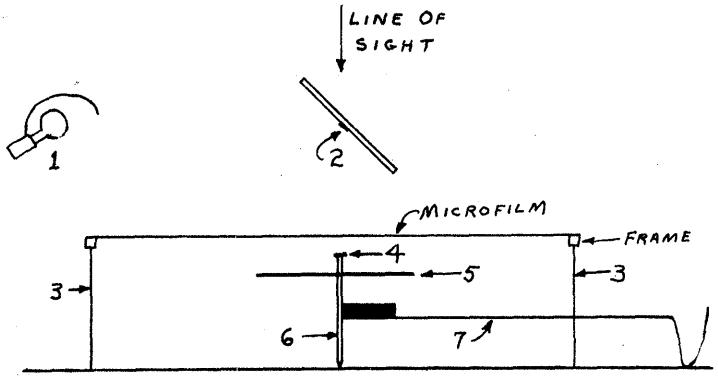
where α = the angle between the line of sight (where the color changes) and the perpendicular to the film surface.

Bill has the following to say about the measurement technique: "The index of refraction is determined by plotting a curve of apparent optical thickness versus angle, and comparing with a set of theoretical curves, which are plotted for particular values of index of refraction.

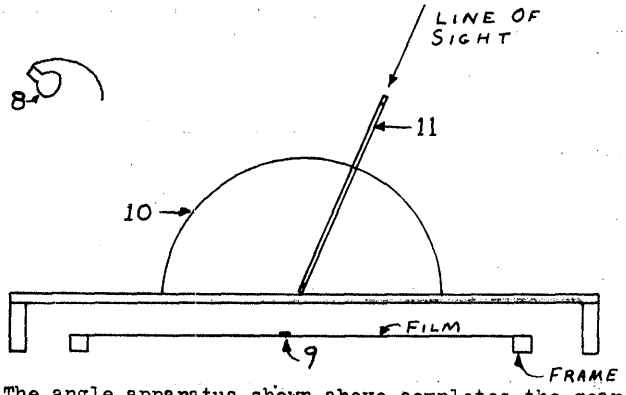
By superposition comparison I mean the following: A pair of films is poured. Each has a reasonably uniform taper in thickness, so that it shows nice bands covering all of the range of thickness of interest. Each film, on its frame, is mapped in thickness by drawing the boundaries of the colors as they appear at right angles to the surface. The two films are placed together (perhaps with a little distilled water between them) and allowed to adhere. The combined film is then mapped. The color bands should be more or less at right angles in the two films in order to get the most information out of the measurements. Marks on the maps indicate the position of the frames. The three maps are combined, lined up as indicated by the marks. This usually means tracing one or two of them. One can then make up an addition table for colors. It was on the basis of such a table that I concluded, at the end of my first investigation, that Reds (only) are additive."

Bill also made the following clarification about the technique of superposition: "If, by superposition, it is found that a + b = c where a + a = b, and a, b, c are thicknesses at certain contours, then a measurement of the angle where c looks like b is a measurement of index of refraction."

Bill's measurement apparatus is also quite interesting, especially since it is simple enough to be easily duplicated.



In the sketch above, #1 is a regular tungsten lamp. #2 is a transparent reflector (window glass) with a small triangle of aluminum for a sighting point. This sighting point is lined up with its reflection in the film (which is firmly supported by base #3) and with another aluminum foil marker #4. #5 is a disc of carbon paper, black side up, which provides a black background. A cut-down ball point pen (#6) forms one of three points of support for weighted slide #7. The pen is moved along the color boundaries and presses through carbon paper (not shown) to draw the contours. The fact that the line is not visible while it is being drawn is an advantage. It is practical and helpful to draw each line at least twice, since the two independent traces give an idea of the reliability of the method.



The angle apparatus shown above completes the gear needed for these measurements. #8 is again a tungsten lamp which illuminates the sighting point #9 on a film undergoing angular measurement. A protractor (#10) with the base parallel to the film surface, carries pointer #11. This pointer has a sight (two pins) and is attached so that it will stay put until moved. The best accuracy is attained when there are at least two colors, preferably more, in the field of view. If it is desired to get a figure for index of refraction, the sighting point should be applied at a boundary between colors as seen at right angles.

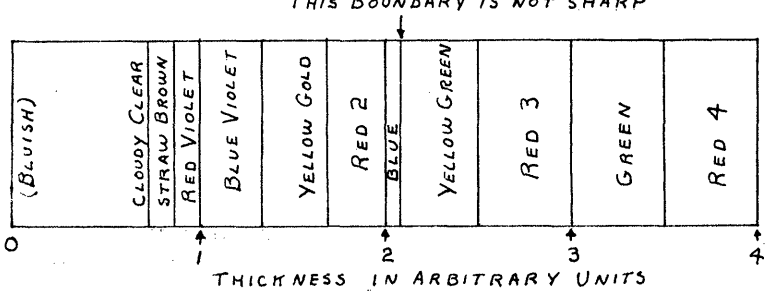
RECORDS? MAYBE!

The only reported record flight during the past month was made by Edmund Smith at the October Lakehurst session. He upped his Sr. Helicopter record, but circumstances kept us from obtaining the flight time.

QUESTIONS AND ANSWERS

One year ago a question arose about the thickness of microfilm. At first glance, this seemed like a simple question. However, the more we looked into it, the more complex it became. The optical thickness of any thin film is equal to the actual thickness times the index of refraction of the film material. We work at a laboratory loaded with exotic research equipment and staffed with a great variety of PHD's. Thin films are very much under study and development, but no one knew (offhand, anyway) how to measure the index of refraction of such a fragile substance as microfilm.

It remained up to Bill Bigge to develop a purely optical method of measuring the index of refraction of microfilm with an estimated accuracy of 2%. With the results of numerous tests and measurements, he devised the scale shown below:



With the methods discussed elsewhere (see THE LAB) Bill determined that the index of refraction of microfilm is 1.5. The optical thickness of microfilm (per unit as shown on the color scale) is 12×10^{-6} /unit. This makes the actual thickness 8×10^{-6} /unit, or 32 micro-inches for the upper end of Red 4. Incidentally, the weight of MicroDyne film one unit thick is approximately 6 micro-ounces/sq. in.

INDOOR FLYING SCALE

In California, the art of indoor flying scale is now growing by leaps and bounds - thanks to the efforts of the N.A.A. Flightmasters. This hard-driving group, under the leadership of Kingsley Kau, has given scale a shot in the arm. In spite of the fact that the event is being treated as an unwanted orphan by many group, competition is fierce for the very few trophies which are offered. At the recent Easy B Annual, eighteen entries were made in two classes which had only a first place trophy in each class.

An offshoot of this growth is the excellent newsletter edited by Bill Warner. It is called FLYING SCALE NEWS & VIEWS, and can be had by sending $2 to Russ Barrera, 1200 the Strand, Manhattan Beach, California.

NEWS FROM AROUND THE WORLD

CALIFORNIA - MOFFET

The October 20 Record Trials was plagued by cloudy weather which prevented the hangar air from warming up. As a consequence the ships took heavier rubber and the added handling problems caused trouble. Joe Bilgri put up his Cabin for 26:26 and then damaged it during the next try. Bud Romak turned in top time in stick with 35:24, only to run afoul of the girders.

CANADA - ONTARIO

John Easton reports that Canadian indoor records are under study. The rules were simplified a few years ago and quite a few classes were combined. With the advent of FAI, consideration is being given to creating a new class conforming to FAI rules.

COLORADO - DENVER

The Martin Model Masters are starting their indoor flying season with a Cat. II contest on November 17. The site is the fieldhouse of the Colorado School of Mines in Golden, Colorado. The fieldhouse has a 40' high ceiling with a shallow peak and a minimum of obstructions. The floor area is 120' x 300', which gives adequate area for holding HLG and rubber events simultaneously. The events scheduled are stick, paper stick and HLG, with a junior event in HLG. For further details contact CD Bob Lynch, 1064 Monroe, Denver 6, Colorado.

ENGLAND - COVENTRY

Another session was held in Cardington on October 12 and 13. Bert Spurr managed his first 30 minute flight that weekend, and Arthur Barr established a new Class B (65 cm. maximum span) record of 25:36. Arthur's flight made it the hard way - on Sunday when the drift was high due to the doors having been open.

The British Indoor Committee recently submitted a new set of rules to the SMAE (rules surveys must be catching) for ratification. Three sizes of models are featured with maximum spans of 35 cm., 65 cm. and 90 cm. with a mike and paper classes in each size. HLG has been set at 50 cm. maximum span and .25 oz. minimum weight. The rest of the rules are similar to FAI indoor rules, and sites are classified into two ceiling heights with the break point at 35 ft. measured to the "lowest major structural member above the center of the floor area."

ILLINOIS - CHICAGO

Very poor attendance and only fair conditions were a feature of the Chicago Aeronuts record trials on October 25. In spite of the few models present, they managed to have one midair collision! Hopefully, there will be more fliers in attendance on November 30 and December 28, the dates of the next two Record Trials.

INDIANA - KOKOMO

Fourteen contestants turned out for the first Kokomo Aero Team indoor session at Bunker Hill AFB, slightly fewer than usual. Ed Hughy won Easy B with 9:16.3, very good time for a 45' ceiling and paper covered models! HLG times were a bit low, however - the site record is 0:42.0, and first place was 0:38.5.

The November session is scheduled for Nov. 17 and the events will be HLG and paper stick.

MASSACHUSETTS - M.I.T.

The Tech Model Aircrafters of MIT have set up seven Cat. II sessions during the coming school year. The site in the MIT Armory at the corner of Massachusetts Ave. and Vassar St., which has a 42' ceiling. The time of the sessions is from 4:30 PM until 8:30 PM, and outsiders are welcome. It would be advisable to contact Eric Greenwell if you plan to attend a session, in case of last minute changes. The next session is November 16, and Eric's address is Box 5031, 362 Memorial Dr., Cambridge 39, Mass.

NEW JERSEY - LAKEHURST

John Triolo was high man at the October 6 Lakehurst session with 32 minutes. This was the final session of the 1963 season, one of the most active seasons in the history of the site. C. V. Russo is responsible for the large number of sessions, along with Lt. Thibodeau of the U. S. Navy. All the East Coast fliers owe these men a vote of thanks for handling the details of these meets.

"Russ" in holding a meeting at his house to plan the 1964 season and discuss pertinent questions about FAI indoor models. Russ lives at 143 Willow Way, Clark, New Jersey, which is near Exit 135 of the Garden State Parkway. Meeting time is 2 PM on November 17, 1963, and everyone interested in FAI models and a good talk-fest is invited to attend.

NEW ZEALAND - AUCKLAND

Jack Eriksen reports that he set two New Zealand records at a recent Cat. I session - 10:20.4 in the 18" span class and 4:53.8 in the flying wing class. In November there will be a session in the 40' hall in Hamilton. They expect that fliers from Wellington will attend - a trip of only 400 miles!

OHIO - CLEVELAND

Chuck Tracy reports the following events in the area near Cleveland: A Cat. I Record Trials for all divisions to be held at the St. Edward High School Gym in Lakewood, Ohio on Dec. 1, 1963 from 9 AM to 4 PM; a meet in Painesville, Ohio on Nov. 24, 1963; the 13th Annual Great Lakes Indoor Air Meet in the Cleveland Public Hall on Jan. 5, 1964. Contact Chuck Tracy, c/o CLEVELAND PRESS, Cleveland 14, Ohio for further details.

TEXAS - DALLAS-FT. WORTH

Things are looking up for indoor fliers in this area since the Cliff Model Club reorganized. They have set up monthly Cat. I sessions in the newly built Arlington Recreation building. The ceiling height is about 25' and the floor area is roughly 100' square. The building is built around a shallow arch which leaves the ceiling very clean. To all appearances this is the best Cat. I site ever located in this area. The sessions are planned for the third Tuesday of eash month from 7 PM to 10 PM, and the first one will be November 19.

STATE OF THE ART

The offering for this month may seem a bit late since the record was set almost a year ago. However, Sweepette 16 Mk. III is still the top Cat. I glider - and a good, consistent design for those who wish to duplicate it.

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." DECEMBER 1963

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

The month of November turned up the following new members:

CLIFFORD K. McBAINE, 2430 W. Cajon Dr., La Habra, Calif.
EDMUND SMITH, Oak Bend, Llewellyn Park, West Orange, N.J.

NIMAS Awards

Recent discussion about the proposed NIMAS achievement awards have pretty well centered upon the following times for these awards:

Award	Cat. I	Cat. II	Cat. III
Silver	10:00	20:00	
Gold	12:30	25:00	
Diamond	15:00	30:00	42:00

Two different times have been suggested for both the Silver and Gold awards. For the Silver award both 28:00 and 30:00 have been suggested; for the Gold award both 35:00 and 36:00 have been mentioned.

With the above concrete suggestions to work on, how about some comments and suggestions? Also, what about some awards for glider fliers? This is one of the most exacting phases of indoor flying, and the glider fliers certainly have come nearer to adapting their art to the particular ceiling height in use than any other group. So, let's hear from some of you glider fliers - if you are neglected it's by your own choice!

Indoor Rules Committee

Much of the rules correspondence lately has been on the Easy B type of model. Perhaps this is just as well, since this represents the thorniest problem in terms of adequate rules, and even in terms of whether the event can be established on a national basis and maintain the same effectiveness it has shown under local administration. The basic difficulty proves to be in the rules - especially if there is any degree of restriction in the rules which are used. The hardest restriction to define is "no bracing" - a concept which is a part of most of the differing sets of rules in use around the country. From the standpoint of national rules, this concept can't be simply defined without using many, many words or else leaving several loopholes. We are open to debate on this point - if you think it can be done, show us!

By the same token, the second common characteristic for Easy B - solid motor sticks and tail booms - is also nearly impossible to define. A third common requirement is to specify that the outlines of the flying surfaces must be composed of straight lines. While this is easy to define and administrate, I feel that this particular requirement, if strictly enforced, would work hardship on many fliers just learning to build. For example, how many readers had the experience of letting a wing or stab slip during covering, so that the spars are crooked? Or, maybe the film (especially beginner's film!) isn't quite "dry" (non-shrinking) so that the surface becomes warped. Two kinds of warps concern the CD who enforces this rule: the "scalloped" wing and curved dihedral. In each case the wing was intended to be straight, and even started out that way. However, by the wording of the rule, the wing is illegal no matter what the intent. Thus, the less experienced builder is penalized by his lack of experience in an event intended to attract him!

Larry Renger (see "Easy Breeze" in the Jan. '63 INAV) made the suggestion that a minimum weight of one gram or .035 oz. be added to the Easy B rules. After overcoming the initial shock, I agreed that a minimum weight rule would have many good points to recommend it. First and foremost, proper choice of weight would eliminate the supposed need for restricting the use of bracing and the requirement for solid components. After all, why save weight with special techniques and then add a hunk of ballast? On the other hand, if the beginner (or expert) builds a wing that is a shade too weak, bracing will save it for use. I've never seen any point in banishing rolled tubes or bracing from beginner models - both are basic to indoor models and both are quite easy to master. After all, are we trying to get people to build indoor models or outdoor models?

All this leads up to my suggested rules for Easy B. These rules entail (in my opinion) the maximum desirable complexity for indoor rules:

Wing: Maximum span of 18" and maximum chord of 3".
Stab: Maximum span of 8" (Some people feel that a limit of stab area is required)
Prop: The prop blades must be all balsa.
Covering: Optional
Weight: Minimum weight of one gram (approx. .035 oz.)

The floor is open to anyone who wishes to debate all or any part of the above, either in INAV or privately by mail. I'm after the best possible rule, and if no one cares about the rules, they sure don't care about the event!

Contest Board Action

In a memo dated December 3, 1963, Phil Klintworth reported that an insufficient number of votes either "for" or "against" had been cast for the Detroit-Chicago-Wilmington HLG proposal to change IHLG scoring to the best three flights out of nine. After reviewing the comments of Contest Board members, Phil suggested this alternate proposal: Change paragraph 13.9 under section 13 (Indoor Hand Launched Glider) to read as follows:

> Scoring of Flights: Scoring time shall be the total elapsed time of the best two of not more than nine official flights. Flight duration shall be scored to the nearest one-fifth second.

Foreign Subscriptions

It has been apparent for some time that the cost for foreign postage plus the cost of production was exceeding the $2 yearly subscription rate. For that reason, it has become necessary to increase the rate for foreign subs to $3 per year, effective January 1st.

FAI INDOOR REPORT

Indoor Team Confirms

Early in November all members of the indoor team as chosen at the Semi-Flyoff (Bill Atwood, Ed Stoll and Frank Cummings) confirmed their intent to compete on the U.S. Indoor Team at the World Indoor Championships to be held in 1964. Although the host country has not been chosen, it is believed that Great Britain will again make Cardington available for the Championships.

Team Manager Balloting

Late in November AMA HQ sent out ballots for election of the manager of the U.S. Indoor Team, with a deadline of December 10. The ballot has only two nominees, Dick Kowalski and Joe Bilgri. It was originally announced that Bruce Paton had been nominated, but he was nominated by Bill Atwood. (The pertinent authority, the minutes of the 1962 Executive Council Meeting, says that nominations shall originate from the competition committee - in this case the FAI Indoor Committee)

Accompanying the ballot was a memo from Walt Good, detailing (two pages worth) the duties of the team manager of any FAI team. This is a very interesting document, and I wish there was space to duplicate it here. For anyone who would take this job lightly, I recommend a thorough study of this memo. It's very enlightening!

65 Cm. Span FAI?

The latest word from FAI Indoor Chairman Kowalski is that Great Britain will withdraw the proposal to reduce FAI Indoor Model span to 65 cm. From the standpoint of official action, it appears that there will be none at this time, and there will be no conflict between present

team's models and experience at the time of the World Championships.

On the U. S. scene, Dick Kowalski has received comments which total to be slightly in favor of retaining the present span. Mail comments to INDOOR NEWS is split about 60/40 in favor of 65 cm, and one flier has been quoted as saying the change to 65 cm is "inevitable." So, it appears the matter is far from dead, and the idea has built up quite a few followers. It seems that those who favor the smaller model are those who don't have a blimp hangar nearby - the 90 cm. model simply cannot be flown to advantage in about 60-70% of the active sites around the world.

GLIDER FLIERS BEWARE!!

If everything happens according to schedule, the next issue of MODEL AVIATION (well, anyway, the December one) will have the Detroit-Chicago-Wilmington proposal which is to eliminate "mike" soaring gliders from competition with the conventional IHLG. The text of this proposal was first printed in the November '61 INAV, and since has been printed on two NIMAS ballots. Once again:

Delete all wording under SECTION 13 (INDOOR HAND LAUNCHED GLIDERS), paragraph 13.3, and change to read as follows:

CONSTRUCTION: An indoor glider must employ components of solid wood throughout. No built up structure is permitted. It may be of conventional design, or of the flying wing type.

Beyond any doubt, this will accomplish the purpose of eliminating soaring type gliders with their freakish and unreasonable high times. This fact I noted, and turned my attention elsewhere until recently. Now, I note that the rule has one or two serious drawbacks. First, there is no provision for experimental structures or materials. Also, the phrase "built up structure" may need clarifying to be sure the conventional wing construction consisting of hard balsa LE and very light TE is not called "built up." Also, what about monofilament or thread on the LE? The wing obviously is not solid wood throughout! If you were planning on trying condenser paper covered styrofoam wings or paper covered built up wings or fiberglass fuselage or sheet balsa wings with stiffening ribs, just forget it! By the way, what about lead or clay nose weight? Must we use hardwood slugs? (Say! That's not a bad idea!)

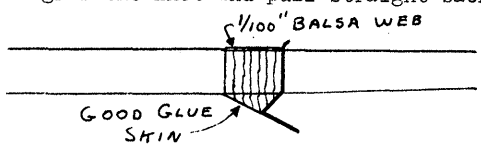
Actually, I may be out of order with the above, since the entire NIMAS membership has had two opportunities to express approval or disapproval of this proposal via the NIMAS ballots. However, many people negated their vote on the HLG part of the ballot by failure to follow the balloting instructions, and about 40% of the membership (many of them HLG fliers) did not return a ballot.

Consequently, if you consider this proposal to be unnecessarily restrictive or unwise, there is just one thing you can do about it. Write a letter to the Free Flight Contest Board member from your AMA District and ask him to vote against the proposal, giving your reasons why you think the rule is not the answer. If you want to be extra safe, send a carbon copy of the letter to Phil Klintworth (Contest Board Chairman). You can find the appropriate addresses in the back of your rule book.

HINTS AND KINKS

Tail Hook Revisited!

Some time back we sketched a tail hook similar to the one shown below, but with an important difference. We failed to show the balsa web so that the hook and the bottom of the web are a straight line. This is important to the idea of the hook - easy removal of a "loaded" motor. If the web doesn't extend to the bend in the hook as shown, the motor will hang on the bend and fail to come off easily. To remove a motor, even a fully wound one, just grab the knot and pull straight back.

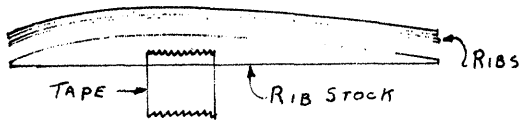


Another Stick Brace

The traditional method of reinforcing motor sticks at the area of the prop bearing and the rear hook has been to install a vertical web inside the tube. Now, it has been suggested that the web be extended through the stick about 1/64" as shown below. This gives additional strength to the joint and provides a "handle" to use handling the stick.

Rib Cutting Hint

One of the most annoying things that can happen when cutting wing or prop ribs is to have the stock slip just as you try to align the template for the next cut. If you use a small piece of cellophane tape to anchor the stock to the board (just a small piece of tape right at the back of the stock), it will be possible to make more accurate cuts. Also, it is possible to cut ribs from the stock until there is only a sliver left - very important if you have Scotch blood!



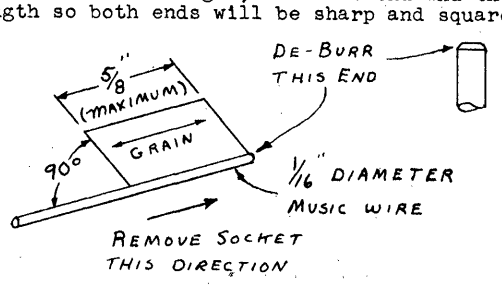
QUESTIONS AND ANSWERS

28. What is the best way to roll tissue tubes for wing sockets?

Rolling tissue sockets is mostly a matter of practice and timing. By timing I mean that once started, you must complete the job quickly and without hesitation. It is possible to increase your yield by careful attention to a few details. The first and most important is the wire form - use 1/16" music wire which has been polished with steel wool or fine wet-or-dry sandpaper. The end should be chamfered and de-burred as shown in the sketch bel

Careful preparation of the tissue will also make your job easier. First, don't make long sockets - 5/8" is as long as is ever needed, and longer sockets are difficult to remove from the form. Second, use jap tissue and be sure the grain is running lengthwise of the finished socket. Cut several pieces of tissue 5/8" wide and 1" to 1 1/4" long (grain running in the direction of the 5/8" dimension), being sure that the edges are square.

Now for the actual rolling operation. Put some thin glue on the form and lay the form on to the edge of one of the tissue pieces with the edges of the tissue perpendicular to the form as shown below. From now on you must waste no time. Check to see that the tissue is stuck to the form, spread a layer of thin glue over the tissue, roll the form forward so at least one layer of tissue rolls up on the form, pick up the form and twirl it between thumb and forefinger so the rest of the tissue rolls up evenly. Continue twirling until the end of the tissue sticks down and the excess glue is squeezed out. Immediately push the socket off the form and let it drop to the table. If you hesitate, the glue at the end of the form will make it stick. If you start with the piece of tissue right at the end of the form, the tendency to stick will also be reduced. That's all there is to it; except be sure to clean the form before rolling the next one. The finished sockets must dry at least an hour over a lamp or overnight before they are cut to length. When you cut them to length, trim one end and then cut the length so both ends will be sharp and square.



RECORDS? MAYBE!

S.H.O.C. SANTA ANA CONTEST - November 10, 1963
CATEGORY III, Santa Ana MCAF Hangar, 180'
Open C Cabin - 29:06.3, Joe Bilgri

LAKEHURST RECORD TRIALS - October 6, 1963
CATEGORY III, Lakehurst #6, 170'
Senior Helicopter - 6:45.6, Edmund Smith

CHICAGO AERONUTS RECORD TRIALS - November 30, 1963
CATEGORY II, Madison Street Armory Drill Hall, 75'
Senior Paper Stick - 13:48.6, Dave Erbach

NEWS FROM AROUND THE WORLD

CALIFORNIA - SANTA ANA

The post-Nats letdown seemed to have let up somewhat and the attendance at the November 10 was larger than the previous two sessions. Bill Atwood and Frank Cummings were testing new FAI ships, but Joe Bilgri stole the show with his record cabin flight. He was assaulting the mark with two models at once, but the reserve model stopped with only 27:31!

ENGLAND - COVENTRY

Arthur Barr reports that a search is on to locate all the airship sheds that were built in England and find if any are still usable for indoor. It appears that there were at least 20 of them, and Tom Chambers has devoted a lot of research on these sheds toward an article for Northern Area News, a very well done model newsletter.

ILLINOIS - CHICAGO

The Madison Street Armory was almost crowded November 30, as about 20 modelers showed up with models ranging from HLG to ornithopter. The air temperature inside the Armory was about 50 degrees all day, which doubtless is one reason only one record (see RECORDS? MAYBE!) was set. Pete Sotich says the next Record Trials is scheduled for December 28, 1963.

INDIANA - KOKOMO

Sixteen contestants turned out for the November 17 contest at Bunker Hill AFB. Five Juniors and eleven Sr.-Open contestants entered Paper Stick and HLG, with top time by Ed Hughey's Paper Stick entry - 12:39.2. Junior Paper Stick was won by Tom Ersted with 6:39, and Dick Robison won Jr. HLG with 0:31.5. Meredith Chamberlin and Bob Larsh tied solid in Open HLG with 0:40.0, while Sr. John Moss was right behind with 0:38.6. Their next contest will be December 15; events HLG and Easy B. CD - Chuck Borneman, 1401 West Taylor, Kokomo.

LOUISIANA - SHREVEPORT

Mark Valerius reports the boys in Natchitoches have an offer of sponsorship and site with a 60' smooth ceiling. Preliminary plans involve a contest in January if at least 15 contestants indicate interest. If you are If this one comes off, it might be the start of inter-city contests in the South, for the first time since before World War II.

MASSACHUSETTS - M.I.T.

The November 12 session in the MIT Armory was well attended, but there weren't any record breaking flights. That is, unless you count the number of times Eric Greenwell's electric model bounced off the walls! Their next session will be on January 18, and those who plan to come would be advised to contact Eric at Box 5031, 362 Memorial Drive, Cambridge 39, Mass. The Armory is on the corner of Massachusetts Ave. and Vassar St., and the time is 4:30 PM to 8:30 PM.

MICHIGAN - DETROIT

Although the teen dances are no longer being held in the Coliseum, some of the associated trappings are still up - enough to discourage any serious flying. Ed Stoll has been trying to get permission to try out Cobo Hall, which is one of the finest convention facilities in the city. If it can be used, it might be the best Cat. II site in the country. Or, it might not. The floor area is 500' in diameter and the usable altitude is 90', but there is some doubt about the air stability because of the air conditioning system.

MISSOURI - ST. LOUIS

Thanks to a lot of effort by Ed Veselsky, the Kirkwood Thermaleers have fairly frequent access to a 20' gym which has a pretty clean ceiling. At the first session, Carl Fries led the bunch with an Easy B flight of 4:47. Carl says they plan their first contest sometime in January, and Carl will be happy to furnish more details as soon as they are decided. Carl's address: 8798 Sturdy Drive, Crestwood 26, Missouri.

NEW YORK - ORANGEBURG

If Sid Bernstein can arrange a usable schedule, he hopes to set up some Cat. I sessions in the Rockland State Hospital gym. The gym is impressive, with the 33' flat ceiling and 80' x 150' floor area, but they had some drift problems last year. It's still a really fine place to fly, so check with Sid c/o Research Facility, Rockland State Hospital, Orangeburg, New York.

NEW ZEALAND - AVONDALE

Good conditions and excellent flying came together in the 40' hall in Hamilton where a recent flying session was held. John Malkin's new FAI turned 14:38 to upset a 26 year old record of 13:15.2, and Jack Eriksen flew a 110 sq. in. model to second place time of 13:54.4. The New Zealand fliers are getting much better, and this is shown by the top four flights of the session - all of them are over 10 minutes.

TEXAS - DALLAS

The November 24 indoor session in Arlington was postponed by the untimely death of President Kennedy, so the Cliff Model Club plans to try it again on December 15. The site is the new Arlington Recreation Center, just off Abrams Rd. in Arlington. Time from 2 PM until 6 PM.

WASHINGTON, D. C.

The D. C. Maxecutors of Washington, D. C., is a new FF club which is presently concentrating on indoor. The boys flew to a top time of 2:45.4 in their meeting room, which is pretty good for an 8' ceiling! Contact Bill at 5131 Massachusetts Ave., NW, Washington, D.C. 20016 for information about this group.

STATE OF THE ART

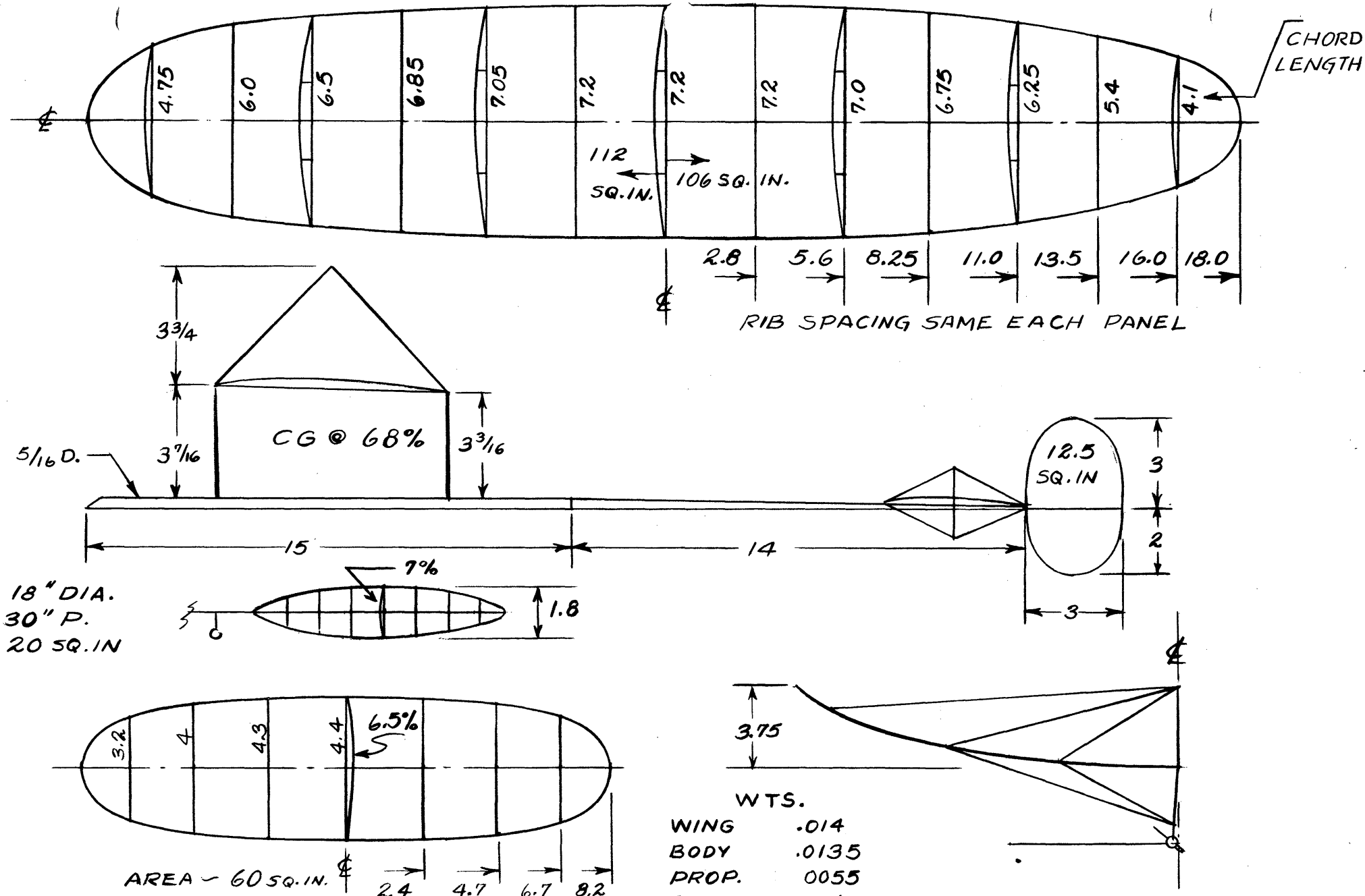
This month the featured model holds the Cat. III D Stick record even though it is only FAI size. Designed and flown by Ernie Kopecky, the model logged the highest single flight time at the FAI Flyoff last August. Ernie gives the following design background information: The left wing chord is wider for torque control in lieu of wing offset or wing wash, in the interests of higher efficiency. Ernie experienced difficulty in handling the power burst in an earlier model, but the problem was solved by using the offset fuselage brace similar to the one used by Reike on his World Championship model. This overcame the earlier tendency to fly straight under the burst, and kept the turn constant throughout the flight.

Contrary to common practice, the winning flight used rubber equal in weight to the model. Ernie compares the flight patterns of 1:1 power/weight ratio models to those with 1.3:1 and 1.5:1 ratios thus: "I noticed the models with 1.3 to 1.5 ratios would go up fast, stay in the danger area longer and take 1/3 the total time coming down, whereas the 1:1 model takes about 2/3 the total time coming down and thereby utilizing the air space more efficiently."

Ernie tells the following story of the flight and his part of the Flyoff:

"At the FAI contest I was both lucky and unlucky. Lucky to complete a flight with the model bouncing off the girders for a record. The second attempt ended when a fully wound motor collapsed the stick and cracked the prop spar. I suspect I nicked the stick with my thumb.

Model #2 was tested and looked to be more promising than the first. That is, for the same power as the first model which used an 18 x 30 prop, the second flew with an 18 x 32 prop. To get a second official time on the record I made a flight with 2/3 winds for 31 minutes, and it gained only about 70 feet of altitude. Full turns were put in for the third and final official of the day. On the basis of the 31 minute flight, I calculated about 47 minutes with about 12 minutes to peak height. The model was launched and to my dismay, in 6 minutes it was on top and finally hung up in 11 minutes. Scratch #2 and flying for the day. That night I repaired the stick and splinted the prop on the record model. During testing and flying the next day the stick held up but I couldn't get the prop to perform well. I couldn't get the model over 80' and the best time I could get was 34:08."



WTS.

WING	.014
BODY	.0135
PROP.	0055
BOOM+TAIL	.006
	.039 + .039 MOTOR (18" DRY) = .078

43 min. 42 sec. ON 2600 TURNS "SUPE-A-LUBED

FAI FINALS ~ 1963
LOS ALAMITOS, CALIF.
ERNEST KOPECKY

Geo Batich

INDOOR NEWS AND VIEWS

BUD TENNY "Voice of N.I.M.A.S." JANUARY 1964

INDOOR NEWS AND VIEWS (Subscription only) $2/year
N.I.M.A.S. Membership (Including INAV) $3/year

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

The New Year

As we enter into the year 1964, let us resolve to try to make it a year comparable to 1963. This is a formidable task, since 1963 was a banner year for our sport. We saw the former standard of excellence - the 30 minute flight - become a thing of the past as 40 minutes won the Nats. Two months before, we had the first U. S. "40" - Tom Finch's winning FAI flight. Breathless observers at the FAI Semi-Flyoff saw eight more 40 minute flights - three by Bill Atwood - and a new National record of 43:42 by Ernie Kopecky. What more could we ask?

It is somewhat disconcerting to realize that at the time of this writing (Jan. 5) the three major model magazines gave the Indoor Nats and the FAI Flyoff a total picture coverage of fourteen pictures! The new AM Annual gave us one of the fourteen pictures - last year there were eight pictures and four three-views in the Annual. What have we done to become lower class citizens? Why are we being ignored in our hour of triumph? How can we hope to interest those outside our own ranks with no more coverage than this? Those of us who have worked hard to build indoor to its present level hope that matters will improve in months to come.

A Backward Look?

INDOOR NEWS AND VIEWS for December 1961 announced the formation of NIMAS under the banner which has headed this column ever since. Let us review the announced purposes for NIMAS, to see if we have lived up to those purposes:

1. To act as the voice of indoor fliers in the United States.
2. To promote indoor in any way, but particularly by encouraging newcomers.
3. To act as a clearing house for comments on indoor rules change proposals.
4. To act as point of origin for ideas that are becoming rules proposals.
5. To provide, when possible, changes in technology, advanced design data, and any other technological information about indoor models.

I will leave it up to you - please make suggestions and comments which will help us to improve our score where we have lagged behind and to improve our coverage where we hit the mark.

Back Issues?

In September we announced the availability of quite a few back issues which went for 25¢ handling charge to NIMAS members or 10¢ each to subscribers. It soon was easy to see that it was a bargain - there were enough back issues that it cost 30¢ to mail them!

SO - we have a few each of October, November and December 1962 and quite a few each of all the 1963 issues on hand. Come and get them - 10¢ each to subscribers or 35¢ handling charge to NIMAS members - stamps preferred.

Contest Board Action

The End Of Year Status Report of the Free Flight Contest Board listed the following indoor matters:

1. Solid Stick Proposal - Rejected, File Closed.
2. Proposal to add FAI Indoor as an AMA class - now in three month study period.
3. Solid components HLG proposal - in three month study period - see the center column, page 13, in the December '63 issue of Model Aviation.
4. Proposal to change IHLG scoring to best 3 flights of not more than 9 flights - vote in progress. The first ballot was inconclusive; as a result of comment by CB members the proposal has been changed to best 2 of 9 flights. Second ballot now in process.

For those who have written in response to the Dec. '63 editorial on item 3 above, the proposal is now out of the field of responsibility of the Indoor Rules Committee. See page 4 of the December Model Aviation for the addresses of Free Flight Contest Board members. Make your comments to the board member from your AMA District. It is a good practice to express yourself on all rules proposals which effect the events you fly, no matter what side of the issue you are on.

Let's Get It Straight!

Some recent correspondence pointed up that possibly some people have a misconception over the current effort to find some rules for Easy B which are acceptable on a nationwide basis.

In a past issue I remarked something about whether Easy B could be established on a national basis. By this I meant added to the AMA rule book, but some people got the idea that Easy B would become an event at the Nats. To my knowledge, there never has been any official plans to alter the Nats indoor events, and especially not to add Easy B or to substitute it for some present event.

The present interest in Easy B rules stems from the recent suggestion by the AMA Executive Council that a novice type indoor event be created. The Free Flight Contest Board was asked to do this, and Chairman Phil Klintworth made this one of the things for the Indoor Rules Committee to look into.

If my previous remarks have caused you to get the wrong idea over Easy B, please accept my apologies. As Chairman of the Rules Committee, I am vitally interested in your feeling about Easy B, especially from a rules standpoint.

FAI INDOOR REPORT

Indoor Team Manager Chosen

The recent election for team manager of the U. S. FAI Indoor Team was won by Dick Kowalski. Team managers are nominated by members of the FAI Indoor Committee and the Committee and the three members of the team were polled to make the choice.

Now that the manager has been chosen, the team is complete. The flying members, in case anyone hasn't heard, are Bill Atwood, Frank Cummings and Ed Stoll.

Indoor Chairman Needed

Dick Kowalski resigned his post as Chairman of the FAI Indoor Committee, effective January 1, 1964. As of this time, AMA President John Worth has not named anyone to head the Committee.

INDOOR RULES COMMITTEE

Renger Talks Back!

Larry Renger and I have had quite a bit of good-natured banter over Easy B rules in past weeks, and here is his reply to the commentary of last month:

"It is my feeling that your column presented the rules as if they were the agreed-upon set determined by all your various correspondents.

Looking through back issues of INAV I find that ONLY in Dallas is the event flown with bracing and hollow structure. Thus the rules presented were YOUR rules and do not agree with practice in the rest of the country or overseas.

As I have told you before, bracing and hollow structure make the event 'just another' indoor paper stick event. Even the weight limitation won't help things then.

In my opinion the full Wilmington set of rules, plus the weight limitation are necessary if you want the event to be 'Easy B'. On the other hand, if you want the event to push the 'state of the art' forward, the rules should be just as the original Wilmington formula.

It is true that bracing would save a beginner's too weak wing, but his plane would be too light if his wing is that weak. If the weight rule is not used, the beginner hasn't a chance anyway and can fly a braced model but not enter. Although contests and entrants are vital, I don't see the combat rules requiring Ringmasters and Fox Stunt motors because beginners can't fly a fast plane. No matter how you make the rules the 'expert' will win, unless you require a certain moment of inertia, CG, C_d, C_l, prop efficiency, max number of turns, max prop torgue, standard surface flex, and a particular trim. If you did (if you could), I have a pair of dice which would make the CD's job easier.

All you can hope to do with an "Easy" rather than "Solid" set of rules is make the planes easier to build and fly, more consistent, and cause beginners to be less likely to go underweight.

To retain the 'Easy' part for the 'expert,' and some originality for the event, bracing and hollow structure must go!

The second thing that had me annoyed was your choice of 8" max span for the stab. Not only is this rather arbitrary, it doesn't even make a pretty aircraft. At present I have redesigned the Breeze to use a 8 3/4" span stab. The area is still 35%, so all I did was increase the aspect ratio. The Wilmington rules state 50% max stab area. This would be a 9" x 3" stab if you wish to limit dimensions rather than area. There is no reason why the AR of the stab should be lower than 3/4 that of the wing. The 8" rule would place severe restrictions on design. Admittedly an 8" stab works fine, but stab span should vary from about 7" to 9"; limiting it to 8" cuts off half the normal not excessive design variation."

In reply to this commentary, I will comment on only the last three paragraphs in order:

1. The third-from-last paragraph pretty well sums up exactly what a well-planned "novice" event should be!

2. Which set of rules would seem to allow more "originality for the event" - rules which make five design specifications ("my" rules - Dec. '63 INAV) or rules which make ten design specifications (Wilmington rules with weight limitation added)?

3. The Breeze, with 8" stab, set the current Sr. B Stick record of 10:38.6 sixteen months ago. To my knowledge, no Easy B of any age class has made a longer Cat. I flight, either before or after.

LOW CEILING FORUM

In October I introduced the experimental concept of using a low power-to-weight ratio as a means to control the altitude gained by indoor models, especially for Cat. I and Cat. II flying. Since that time there has been no good opportunity to do any serious testing of this mode of operation. However, the few flights which have been made, while not proving anything, have made two things fairly evident. First, the method will definitely limit peak altitude attained, but it seems likely that to limit climb sufficiently in Cat. I (with present techniques) will require so little rubber that the potential duration will also be severely limited. With a realistic amount of rubber the rate of climb is somewhat reduced, the time spent in the hang-up zone is less, and the loop length can be adjusted so the cruise is much better than with conventional methods.

The second thing which becomes apparent is that a good starting point for low power experiments for 26' and lower ceilings is a power/weight ratio of about .5:1. The recent flights included some with a B Paper weighing .045 oz. on rubber weighing .023 oz. The last flight of the day managed to hang up in the cleanest imaginable site, after proving that the power stalls of earlier attempts had been cured. The previous flight lasted for about seven minutes and landed with quite a few turns, power stalling in the climb and stalling slightly in the cruise. Cruise RPM checked out at 80 on the 14 x 22 prop at four minutes after launch. On both flights the model was wound about 60%. At least, it sounds promising!

The October article inspired Phil Hainer to make some comments about special models for low ceiling flying. He has held the Cat. I B Stick record at 14:23.1 for over years; the model was featured in STATE OF THE ART in tl April '62 INAV. Phil's comments:

1. Since there is limited space in low ceiling sites the model must fly slowly in order to rack up time.

2. The model must fly at a high angle of attack since most indoor airfoils give a higher L/D at a high angle of attack.

3. The wing loading must be kept low by building the structure as light as possible. This is possible as the slow flying speed reduces flutter and contact damage.

4. Because of 2 and 3 above, the sinking speed is less.

5. Use high aspect ratio on both wing and stab. This will reduce drag and help control a larger diameter prop.

6. Use more wing offset than usual to help control torque and tighten the turn for small buildings. This will also help control stall tendencies induced by flying at a high angle of attack.

7. Build the tail light and brace it with light wire to avoid drag and model distortion caused by twisting tail surfaces.

8. Design the prop (larger diameter with lower P/D) so that 60% of the blade area is in front of the spar. Use elliptical blade shape, and keep the maximum blade width at about 60% of the radius. This type of prop will flare nicely for climb but will return to normal pitch better and thus give more constant prop RPM.

9. Offset the thrust bearing about 45 degrees to the left - that is - rotate the stick clockwise to giv both left and down thrust as the stick bows in the burst. This will help hold the turn in the burst.

10. Keep the tail moment as short as possible without making the longitudinal stability marginal and offset the boom for turn.

11. Put 60% of the fin area above the stab and 40% below; incorporate the fin into the tail bracing structure. This will improve dynamic stability, reduce balance problems and help prevent the fin from stalling.

12. Use 6-8% airfoils with maximum thickness at between 35% and 40%; locate CG at 65%; use elliptical dihedral for mike; simulate elliptical dihedral with polyhedral for paper and use standard bracing rather than picket fence bracing, all for lower drag.

13. Make all incidence variations at the tail - it's more work, but the amounts needed are less.

14. Use full elliptical surfaces throughout to reduce tip flutter and move lift distribution closer to dynamic center of the ship.

15. Break in the motor by the stretch method. Start to wind while stretching and put half the turns in on the way out - this will increase the cruise.

RECORDS? MAYBE!

ST. EDWARD'S HIGH SCHOOL RECORD TRIALS, December 1, 1963
CATEGORY I, St. Edward's High School Gym, 33' ceiling
Junior Autogyro - 2:22, Herb Schubert, Jr.
Open Autogyro - 2:25, Kenneth B. Johnson

CHICAGO AERONUTS RECORD TRIALS - December 28, 1963
CATEGORY I, Madison St. Armory Lecture Room, 22'
Sr. B Cabin ROW - 3:31.2, Dave Erbach
CATEGORY II, Madison St. Armory Drill Hall, 75'
Sr. B Cabin ROW - 7:44.7, Dave Erbach
Sr. B Stick - 17:16.8, Dave Erbach

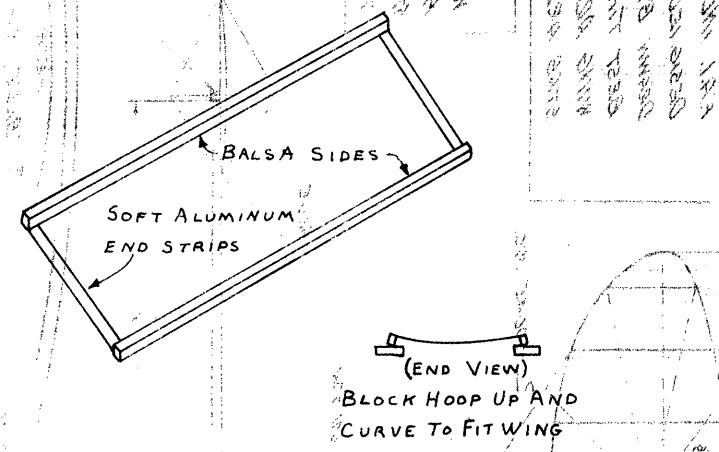
CLEVELAND PRESS RECORD TRIALS - December 29, 1963
CATEGORY II, Cleveland Public Hall, 80' ceiling
Junior Autogyro - 2:10, Herbert Schubert, Jr.
Senior A ROG - 10:19.5, Larry Loucka
Open Autogyro - 3:33, Ronald Ganser

HINTS AND KINKS

With the advent of models like the Easy B, which have straight line outlines, many modelers are building on plans instead of using cardboard templates. To protect the plans, the time-honored wax paper has been used. In this day of scientific advances, try stretching polyvinyl film over the plans and holding it down with masking tape around the edges. The glue doesn't stick at the splices, and if you use a little too much glue it forms a neat "puddle" which can be sliced off easily with a sharp razor blade. Almost all households have a handy source of this film - it comes as wrapping around your clothes when you get them back from the dry cleaner.

New Microfilm Hoop

Phil Hainer passes on this hoop design which makes it much easier to cover the most fragile flight surfaces. Refer to the drawing below to construct the hoop - the sides of the hoop are balsa or spruce as usual, but the ends are 1/2" wide aluminum strips made from 1/16" or 3/64" soft aluminum glued on with epoxy cement.



When making the film, Phil puts a dam of modeling clay on the aluminum strips to prevent water from running on top of the film.

The covering procedure is this: invert the hoop and block it up off the table. Carefully curve the end strips to match the airfoil curve of the part to be covered, and lay the part upside down in the trough of film. Using a fine brush, moisten the outline with saliva or water, starting at the center of each spar and work slowly to the tips to avoid distorting the frame. Be sure that the work surface is covered with paper or something else to protect the covering, and start trimming the part. Leave several small tabs of film around the edge until last, then cut these loose and let the wing drop to the table. Now the hoop can be moved away from the work surface and work can continue.

NEWS FROM AROUND THE WORLD

CALIFORNIA - VISALIA

In the INFORMER, Don Farnsworth noted that indoor meets are being planned in Visalia for the winter and spring. Contact Don at 2040 Cecil Circle, Visalia for times, places and events.

HOLLAND - ROTTERDAM

Cornelis Wolthoorn reports that he has raised the Dutch indoor record to 4:37 with a model similar to the Easy B. Interest is slowly picking up in spite of few and poor sites, and it may pick up more soon. AVIA, a Dutch aircraft magazine, plans an article on NIMAS and a picture and three-view of Cornelis' model.

ILLINOIS - CHICAGO

With two well-attended record trials under their belt this winter, the Chicago Aeronuts plan a contest for Easy B and Jig Time models on January 25, 1964. There will be a special trophy in each event for highest single flight by a junior. Contact Pete Sotich for a copy of the rules which will be used. Pete's address is 3851 West 62nd place, Chicago, 60629.

Out-of-town entrants in the December record trials included Walt and Dave Erbach from Nebraska (600 miles) and Bob Larsh and Bill Denson from Indianapolis (200 miles) - dedicated fliers!

INDIANA - KOKOMO

The KOKOMO AERO TEAM NEWSLETTER edited by Chuck Borneman reports a lot of indoor activity in that general area. The Purdue University Aeromodellers are setting up events in the Purdue Armory, while Anderson Sundusters, not knowing about Chuck's group, set up a December 15 contest in conflict with the December Bunker Hill AFB meet. Now that these groups have heard of one another, their activity should reinforce both groups.

LOUISIANA - SHREVEPORT

The plans are firming up for the Natchitoches contest with the date to be early in February. The site is a new building on the campus at Natchitoches, reported to have a 60' smooth ceiling. Contest events are to be B Paper Stick, HLG, and Easy B with these rules: 18" span, 3" chord, 8" stab span, prop blades must be all balsa, and models must be paper covered. Contact Mark Valerius for more info - 461 Choctaw Trail, Shreveport, Louisiana.

NEBRASKA - LINCOLN

The Lincoln Sky-Knights 2nd Annual Indoor Contest was held in the 44' University of Nebraska Fieldhouse on December 8. Dave Linstrum of Manhattan, Kansas had high time in HLG with 0.31 and high Easy B time of 4:26. High Paper Stick time of 8:40 was by Dave Erbach, while Walter Erbach ran interceptor with his ornithopter.

NEW JERSEY - CLARK

The meeting of indoor modelers at C. V. Russo's house in November resulted in a suggested FAI Team selection plan and detailed planning for the 1964 Lakehurst season. Ten sessions are planned, alternating Record Trials with contests for the following events: Paper Stick, A ROG, C Stick, Original Design contest and Cabin. The dates for the sessions have not been settled with the Navy yet, but they will be made known as soon as possible.

OHIO - CLEVELAND

The 13th Annual Great Lakes Indoor Air Meet was the usual well run contest - with more than 5000 official flights during the one-day meet! Hand launched gliders, prefab models, paper stick models, and microfilm models were flown by six age classes (Junior flew in four age classes) in competition for 90 trophies and plaques. Even though the ceiling is 80' tall, where did they put them all?

TEXAS - DALLAS-FT. WORTH

The Cat. I session of the Cliff Model Club came off as scheduled and was pretty well attended. Most of the glider fliers were getting 21-22 seconds under the 26' arched ceiling, but Mike Fedor worked up to 0:27.0 late in the day. Both paper stick models that were flown hit around 7 minutes and found very little drift. Jerry Murphy stirred up the air several times with his Fokker D-VII scale job (a real rocket climb!) and his ornithopter caused a bit of stir also.

The next CMC session is in the Arlington Rec Hall on January 19, 1:30 to 5:30 PM, but the February session is planned to move to the Dallas NAS Drill Hall (low Cat. II) on February 16 for a contest with Indoor Stick, HLG, and Indoor Scale.

STATE OF THE ART

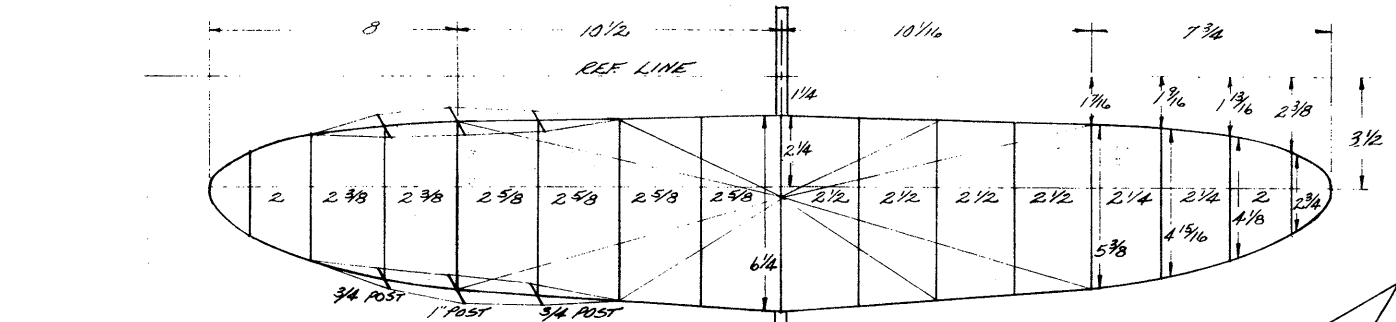
Bob Champine placed fourth and made a strong bid for a place on the U. S. FAI Indoor Team with the feature model for this month. Bob is a long term member of the Langley Brainbusters and a top-notch test pilot for NASA.

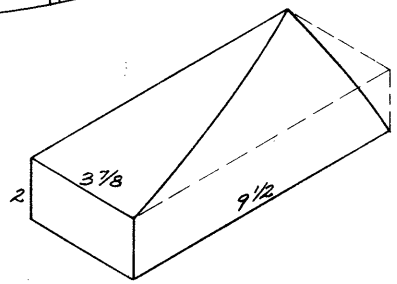
His model represents the general trend now starting (in FAI circles) toward the type of model pioneered by the German FAI team - long tail moment, generous stab area, rearward CG location, and moderately high aspect ratio wing. The unusual feature of the model is the adjustable stab incidence for very close trim.

At the first Lakehurst session after the Flyoff, Bob tested another prop with this ship to establish a new personal record in Lakehurst. He felt the 19 x 32 prop shown here climbed a bit too fast, so he made a 20 x 32 which was quite similar. Cruise RPM remained about the same, but the climb RPM was about 10% slower, the model peaked at catwalk height and landed with fewer turns. The new prop used an 18" loop of .040" x .063" pirelli, while the Flyoff flights with the 19 x 32 used a 22" x .040" x .056" motor.

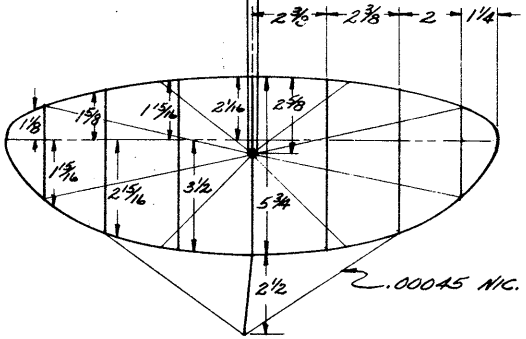
HE SCOOPED ME!

In VTO, the free flight column (M.A.N. Feb.'64 p. 8), Dick Black gave very good coverage on Ed Stoll, the #2 man on the U. S. FAI Indoor Team. He also has a three-view of Ed's model, identical to the one you eventually would have seen in "State Of The Art" if Dick hadn't beat me to it. However, the article will do more for indoor there than the limited circulation it would have in INAV. Actually, any FF'er who doesn't read VTO is strictly missing the boat - but good.



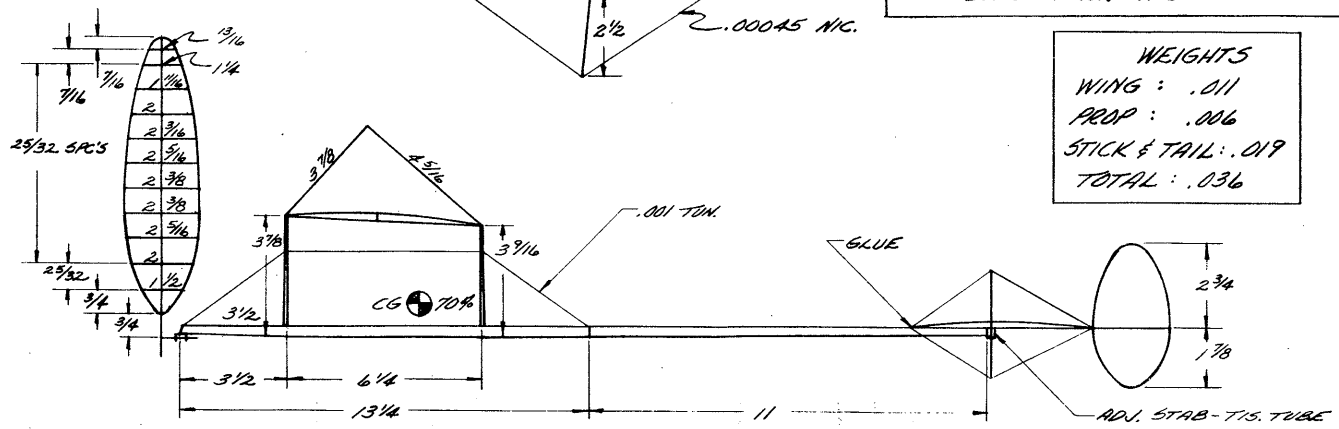


POWER: .056 × .040 × 22 (.053 oz)
PROP: 19 × 32
HTR. STICK BLK: .0125 oz × .013 THK
ON 9/32 BR. TUBE
2500 TURNS CRUISE: 42 R.P.M.

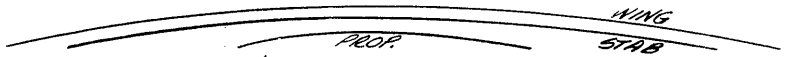


F.A.I. INDOOR STICK
DESIGNED BY: BOB CHAMPINE
DRAWN BY: DON C. FARNSWORTH
BEST TIME: 41M 23S
WING AREA: 186.2 ▣
STAB AREA: 11.8 ▣

WEIGHTS
WING : .011
PROP : .006
STICK & TAIL: .019
TOTAL : .036



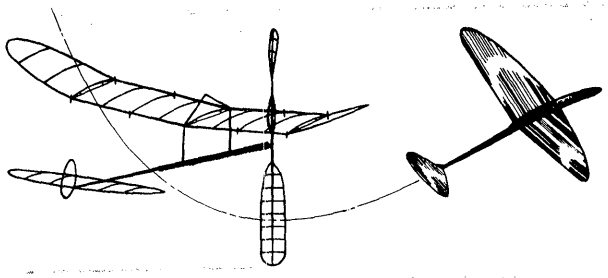
#2 (YELLOW) SHIP 1/2 McBRIDE B-T



#1 (BLUE) SHIP

The Voice of N.I.M.A.S. FEB·1964

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

Recently, we gained three new members of our group; two Juniors and one honorary member from England, also a Junior.

RYAN RIORDAN, 4400 West 155th St., Cleveland 35, Ohio
ERIC VOGEL, 6616 Spring Valley Rd., Dallas 30, Texas

WILFRED J. TROTTER, 1 Blackmans Close, Dartford, Kent, England

Change of Address!

Ray Harlan, Eastern member of the Indoor Rules Committee, has asked that his new address be published: Ray Harlan, 118 Decatur Street, Arlington, Mass. 02174.

NIMAS Awards

Chuck Borneman makes this suggestion for NIMAS Awards for gliders:

Award	Cat. I	Cat. II	Cat. III
Silver	0:30.0	1:00.0	1:05.0
Gold	0:33.0	1:03.0	1:10.0
Diamond	0:36.0	1:05.0	1:15.0

Glider fliers, arise! Please express your views on these suggested times!

A New Look

Many thanks to Dave Linstrum of Manhattan, Kansas, for the art work and design of our new masthead. Dave spent a lot of time and effort on the design, and the pleasing result shows this quite well.

FAI INDOOR REPORT

Last November many East Coast indoor fliers met at the home of C. V. Russo to plan the upcoming year and to "shoot the bull" about indoor. Out of that meeting grew a potentially important document - a petition to AMA HQ to adopt some method of appeal with a suitable short time limit for the appeal to be answered. The text of their petition reads as follows:

"As F.A.I. Indoor competitors it is our contention that there should be a method of appeal of F.A.I. Chairman's decision and prompt action taken before the next calendar event negates such decision.

In past years there have been protests that have remained unanswered or action has been taken too late to be of any help to the persons involved. The protests involved in the Eastern 1962 and the Mid-Western 1963 F.A.I. flyoffs are points in question.

We therefore suggest that AMA adopt a judicial procedure to hand down a decision within ten days of receipt of protest. Such prompt action is required to enable benefitting contestant to properly prepare for the next elimination date."

I support the above suggestion wholeheartedly with no reference to past history. Let it suffice to say that we have had protests in the past with no meaningful method of reviewing the decisions which prompted the protest - that is, reviewing the decision before the next elim made any review meaningless. As we have it now, a contestant can be mistakenly barred from competition and his protest will be unanswered for well over a month - in other words, too late for him to take his rightful place at the elim he sought to enter.

INDOOR RULES COMMITTEE

A Word of Explanation!

In the past few months, since the formation of the Indoor Rules Committee, this column has been filled with commentary and suggestions on possible rules changes. Many people have been good enough to write in and express their views, and I have taken the opportunity to inject some views of my own - hopefully it has been understood that no official views or plans have been included. I have agreed or disagreed with parts of many of these comments from others, trying to look at each idea from the viewpoint of both a contestant and a Contest Director.

To quote from the first announcement about the Committee (Aug.'63 INAV): The committee objective is "To review all Indoor AMA Rules and to propose any changes which may be necessary to modernize them to meet present day competitive standards and requirements."

Perhaps it should have been pointed out that the committee is not a rules making body - any and all rules we propose (and there have been none to date) must undergo the same careful scrutiny by the Free Flight Contest Board as any other rules proposal.

In the November '63 issue I expressed my rules philosophy; perhaps it is now in order to share my philosophy on rules changes as expressed in my second memo to the Committee. I said "If we make any changes, we should avoid any which will obsolete many models. We must also have a majority approval of all fliers who feel strongly enough about the matter to contact any of us - and a NIMAS questionaire will be made as widely available as possible to make it easier for them. Also, if an overwhelming majority should oppose a change, so be it." Since that memo, I have altered my viewpoint slightly. I feel that an overwhelming majority must favor a change before one is considered.

More on Easy B

Last month brought in quite a few suggestions on the Easy B event:

To eliminate rules squabbles, Pete Sotich and Bruce Foxworthy (Bruce is our first Sponsored Junior Member) both made the suggestion that Easy B be centered on a standard set of plans which detail what the model shall be. Bruce expanded on the theme to permit a second class for more experienced fliers which would permit them to modify the basic design if they desire - but the "stock" and "modified" models would compete in separate classes.

A Voice of Dissent - Manny Radoff, a long-time indoor flier has this to say about Easy B:

"Easy B should be a suggested event for a local affair. To nurture the novice it should be flexible in its rules to fit the site and the contestants. With a given set of physical dimensions it should change in weight, in material (from paper to microfilm), in construction (from solid to braced), and from all-wood propellor to a built-up prop. It should go through the same growing pains as the builder on the local level. When the builder is ready with his developed skills, let him take on regular classes A,B,C,D,FAI, Autogyro, Helicopter, Ornithopter, Flying Scale, or any novelty event he wants on the national level under national rules where skill and competence are the order of the day.

My 'anti' arguments are not the rules themselves - the dimensions, weights, lines, etc. My opinion is that these Easy B rules should not exist at all nationally at A.M.A. If it is not to be considered a Nats event then

why A.M.A. rules at all? Why uniformity where it doesn't count? The need for uniformity is for preparation for a Nats or World Championship. Local champs can be champs under local rules. There is also no need to push more rules into our A.M.A. rules book which is 'over-ruled' now."

And from a newcomer - Mark Valerius is a speed flier who also flies indoor with eager enthusiasm:

"Having just guided five absolute rank beginners through an Easy B, I have a few comments regarding the rules:

1. Unbraced wings are harder for a beginner than braced ones. Reasons: Wood selection is critical on unsupported wings - anything will work braced. Beginner's wings are warped and bracing assures the correct angle of attack in at least two places on the wing. Bracing makes wash-in a matter of fact, not of hope, on a beginner's floppy wing.

2. Beginners do far better with paper than with "mike". Reasons: Beginners have an awful time learning to pour and handle film. To use film delays the building time a day or two. A paper ship can be built at a single sitting - very important at building instruction sessions. Beginners unavoidably poke fingers, glue sticks, etc. through the film. Condenser paper is tough.

Forget the expert! Easy B is for the beginner, so 'mike' and tubes must go! Bracing is in because it is easier! Forget weight! No beginner knows or cares what his ship weighs! He wants to fly!"

An entirely new idea - Dick Black makes what we feel to be a very good suggestion:

"Here's a thought I just had that may or may not be worth a little discussion. If the AMA really wants to set up some special events for beginners, why not handle them in a special way to insure that they remain in the 'fun' and 'beginner' category? Instead of formal and necessarily complicated rules, establishing new record classes and possible addition of the events to the Nats schedule, let the AMA merely recommend a few simple rules that express the spirit of each event and leave the rest to local groups. The only official recognition the AMA need give these events is that models flown in them are 'being flown safely' as regards insurance requirements.

As an example, the Easy B event has been flown now for several years all across the country under slightly varying local rules. It seemly has proven quite successful as both a fun and beginners event. Under this local regulation everyone knows what such terms as 'solid stick' or 'no bracing' or 'straight outlines' mean and there is no need for long, complicated wording to make them understand or heed. Local groups adapt the basic Easy B rules to fit their own particular situation, but the spirit of the event is left unchanged. There is no mistaking any current Easy B model for another type. What we want to see is that these successes are continued, and if possible, increased manyfold, not to create an event that will give the experts or 'nit-pickers' a field day while the beginners we are trying to reach are discouraged, disillusioned or downright disgusted.

You yourself have said that Easy B was not intended to be added to the Nats schedule. And I seriously question whether setting up record classifications for Easy B would serve any purpose. Why then have strict AMA rules to cover the event?"

INDOOR FLYING SCALE

In a recent issue I noted the tremendous growth of Indoor Flying Scale and credited the N.A.A. Flightmasters with the growth of the movement. I have been gently chided by members of the Wilmington Indoor Model Airplane Club - the group which started active flying of indoor scale a year before the Flightmasters began their work. WIMAC has continued to hold indoor scale contests every other month since their start, and the number of entrants climbs with each contest. Well over 20 entrants made it to the last contest - and that's a lot of flying to do in one three-hour Cat. I session!

QUESTIONS AND ANSWERS

The question this time is one of those troublesome things which often need a solution before the problem comes up - anyone who has solved this problem differently from the following suggestions, please sound off!

29. How can I prevent changes in humidity from causing warps in my condenser paper covered models?

I've heard several solutions to this problem, but each one involves the assumption that such warps will occur unless you take special precautions. After it does warp, all you can do is to re-cover it!

Method 1: Make a sturdy frame the size of a full sheet of condenser paper and stick the paper to the frame all around. Spray the condenser paper with water to preshrink it, cut it loose, and iron the wrinkles out before you use it.

Method 2: Cover in a warm, dry room on a heated work surface (borrow your electric blanket) and keep the paper stored in a dry place when you're not using it. Dry storage can be arranged by rolling the paper and packing it in a tube with silica gel dessiccant.

Method 3: Cut the condenser paper to size and dry it in the oven at 250 degrees for twenty minutes, take it out and cover with it immediately.

LOW CEILING FORUM

In recent months Sid Bernstein has been concentrating on indoor gliders in the Cat. I Rockland State Hospital gym. Certain of his gliders showed a tendency to widen the turn or lose it entirely even though the roll-out had been "just right".

He passes on this tip after quite a bit of testing - it seems to work well and he would like to hear from anyone who tries it. Sid gives Richard Miller credit for the idea which is:

Build the glider as usual, but on the inside wing (left wing if the glide turn is left) install polyhedral instead of dihedral. If the glider already has polyhedral, use more in the inside wing. The roll-out is also improved, as described by Sid:

"Somehow the polyhedral in the inside wing panel causes that wing to drop and the ship rolls out with a sharp snap almost at the ceiling. Apparently, in a small area you need a sharp roll-out and recovery so you don't hit the wall, yet take full advantage of the ceiling."

In case you try this and want to discuss it with Sid, his address is: Sid Bernstein c/o Research Facility, Rockland State Hospital, Orangeburg, New York.

THE LAB

This column was started to furnish a place to discuss ways and means of establishing NIMAS standards for measurements of all the parameters of our hobby. Some of the measurements which may develop will merely be conveniences for more meaningful communication - others will be vital as a basis for scientific advancement toward the ultimate indoor model.

Flight Testing

For the most part, flight testing of indoor models is limited to careful adjustment before winding the model as tight as experience and somewhat educated judgement will allow, starting the watch, and hoping for the best. In addition to recording the number of turns installed and how many turns were left at landing, many people also count cruise RPM as an indication of conditions and model trim.

What I have in mind for flight testing is something far more elaborate - and potentially more meaningful. Recently I became involved in a discussion on prop efficiency. Before long the thing boiled down to lack of information about model flight velocity in various stages of the flight - information vital to a better understanding of propellor performance and efficiency.

I would like to propose some test objectives or bits of information which a flight test series should attempt to measure, and then to suggest some means of making the necessary measurements.

These are the desired measurements:

1. Prop RPM at one or two minute intervals throughout the flight.
2. The number of circles during the flight and the diameter of each. (to get distance and velocity)
3. The elapsed time of each circle and the altitude gain or loss of each circle.

The RPM will be easy to measure, as will the number of flight circles and the elapsed time for each. Circle diameter and altitude gain or loss will be more complex, requiring optical measurements and several people who are closely coordinated by a central clock. Our modeling cousins (third or fourth cousins), the model rocketeers, track their birds satisfactorily even though some of them get out of sight vertically in seconds, so we ought to be able to take our measurements fairly easily.

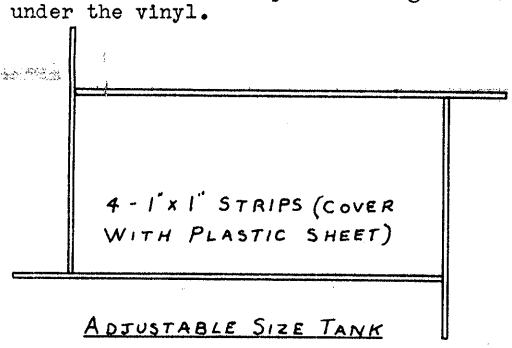
These optical techniques will be satisfactory for Cat. III and High Cat. II sites, but what about the low ceiling fliers? Well, 'way back in the Jan. '62 INAV it was noted that Hu Entrop and Phil Hainer had topped 13:00 in their living rooms with A ROG's flown tether on .001 wire. What would be wrong with testing models on a .001 wire tether just short of the natural turn radius? If the center pole telescopes to keep the tether wire almost horizontal, the altitude can be marked off on the pole. The turn radius is fixed, so the other measurements are simple stop watch operations! Admittedly, there will be some loss in performance, but the data would be better than we have now. Completely aside from the chance to measure the flight parameters, this mode of test flying eliminates most drift worries!

I don't feel that the above is a complete flight test outline, and maybe some of this info can be gained in a simpler fashion. I will welcome all comments and suggestions on the above, and I urge that any group with a regular and frequent access to their site consider this approach to indoor model performance and improvement.

THE MICROFILM STORY

by Bill Bigge

Draw one or two gallons of water in the morning. No, it's not necessary, just easier. Into clean jugs, that is. In the evening, when undisturbed (?), lay out a vinyl table cloth cover on a good-sized table. I am fortunate in being able to use an old dining room table. Make a rim with 1" x 1" strips according to the sketch below, under the vinyl.



ADJUSTABLE SIZE TANK

Pour in the water to about 1/4" minimum depth. If the water is more than a few centimeters deep, evaporative cooling sets up convective instability and the water "stirs" itself erratically. Insulation beneath the tank might help here.

The film frames are made from whatever wood is handy. I use 1/4" square stock for wing sheets and 3/16" square otherwise. I put braces in each corner on wing hoops and in one corner on the smallest hoops. The braces are made flush with the outline on both sides, and help prevent loss of films almost too small for the hoop. The film as poured is not strictly rectangular, Y'know.

All doors and windows shut? Air conditioner off? OK. pour into small bottle -- 24 hours ago if mixing is involved -- the film you expect to use. Protects your main supply from evaporation. Pour or eject from your favorite gadget by a definite procedure and between definite positions in the tank. Maybe put a couple of coins in the tank for targets. Move them around until satisfied with the pattern. Try pouring in the other direction. Adjust tank size. When satisfied, pour as many films as you have hoops for, and maybe more.

I use a squirt gun, or ejector, which works like an inside-out hypo. That is, the seal is at the outer end of the cylinder instead of the inner end of the piston. I consider this almost essential for dispensing an air-hardening liquid. A slightly imperfect seal is of no consequence, as the plunger brings the leaked fluid back into the cylinder. With the other type of seal, leaked fluid stays on the inside of the cylinder and hardens. Very messy for repeated operations. In this gadget we are not concerned with atmospheric contamination of the fluid, which is avoided with the hypo seal.

The piston is 1/2" O.D. aluminum, with a plate epoxied on the inner end. The cylinder is molded from polyethylene sheeting directly onto the piston, which has been partially covered with alumunum foil so that only about 1/8" of the cylinder (at the outer end) actually touches the piston. At the other end of the cylinder the solution goes through a 3/16" diameter molded hole, 3/16" O.D. aluminum tubing, a molded plastic elbow, another piece of aluminum tubing, and a molded plastic "jet", cut off to give the optimum size hole. It was intended to use a mechanism to eject solution at so many cubic mm per inch -- now there's a mixed unit -- by the use of levers or gears, but as it is usually used it merely: (1) tends to give a uniform rate of discharge when operated manually and (2) provides an exact measure, that is to about 2%, of the amount last used.

NEWS FROM AROUND THE WORLD

CALIFORNIA - SANTA ANA

Eleven firm dates have been negotiated for the use of the Santa Ana MCAF hangar by the Sky Hoppers of Orange County; eight record trials, two AMA indoor contests and a flying session are scheduled. The flying session was Feb. 9; the record trials are March 8, May 10, June 7, July 12, August 9, September 6, November 8, and December 6; the contests are on April 5 and October 11.

CALIFORNIA - WILMINGTON

In addition to the welcome news that the indoor scale entry grows with each contest (the last contest had 23 entries), the flight time is moving upward also. The WIMAC record for monoplane scale is 67 seconds and was set by a 15" Fairchild Monoplane. The model was built by Fred Weitzel of Yonkers, New York, adjusted in Fred's living room, and proxy flown by Joe Bailey with no change in trim!

CANADA - WINNIPEG

Bill Graham reports that several fellows are flying in a couple of sites in Winnipeg - a 21' gym and an 80' hangar. "A" ROG times in the gym were over 4½ minutes, and top "A" time in the hangar was 8:40. Bill holds the Canadian HLG record of 0:47.4, set in a 65' ceiling. He has since hit 0:56 in the same site.

Canadian model rules makers have updated their rules, which are up for approval now. The proposed rules allow four classes of Stick (counting FAI), HLG and Helicopter.

ILLINOIS - CHICAGO

The Chicago Aeronuts January 25 contest for Easy B and Jig-Time models pulled in 26 contestants who made 55 entries in the four events. Top Jr. Easy B time was 6:09.6 by Jim Thornberry; Charlie Sotich won Sr-Op. Easy B with 10:10.5. The fifth place time was 9:25.4 by Art Christensen; since re-entry was permitted, Art did and got 9:29.9 for third. He beat Bob Larsh's 9:27.7 4th place, but Bob also got 9:53.4 for second! Jr. Jig-Time was won handily by Teddy Mills with 0:40.2 and Dick Lyons won Sr.-Op. with 0:46.9. The contestants came from as far as Kokomo, Indianapolis, and Bloomington, Indiana compete.

The next Armory contest will be Feb. 22 and will have events for IHLG, Easy B (Jr. only), Paper Stick and Indoor Stick. Then, on March 21, there will be another contest for IHLG, Easy B and 24" span rubber models.

INDIANA - KOKOMO

The January indoor contest at Bunker Hill AFB pulled in 20 entrants. Top Easy B time under the 44' 6" ceiling was was 9:26.4 by Ed Hughey. Ed nearly always wins, but Bob Larsh and Jim Bennett are closing in with 9:10.6 and 8:59.4 respectively. Just for the record, these are paper covered Easy B models! Meredith Chamberlin won HLG with 0:44.0, a new record for the site, and Bob Larsh got 0:41.5 for second. Their February contest will be on Feb. 16, with HLG, Easy B and Flying Scale, using WIMAC rules for scale with a few reservations.

MASSACHUSETTS - M. I. T.

The next session in the M.I.T. Armory is scheduled for February 22. The Armory is located on the corner of Massachusetts Ave. and Vassar St. and the time is from 4:30 PM to 8:30 PM. If you plan to attend, contact Eric Greenwell, Box 5031, 362 Memorial Dr., Cambridge, Mass. 02139, so he can notify you in case a conflict arises.

NEW YORK - ELMIRA

The Elmira group moved into a new site with 22' and about twice the floor area they have been used to. At the same time, their activity expanded to include some Open fliers and some indoor scale flying. Jim Mayes and Oscar, his father, topped the group with 0:21 and 0:22

in HLG. This group also believes in starting them young, and Tim Trampenau (7) had some 45 second flights with a jap tissue covered stick model. This is a going group - if you would like to get in on the fun, drop a line to Oscar Mayes, 413 Sharr Ave., Elmira, New York.

TEXAS - DALLAS-FT. WORTH

More attendance, more and better models, and drift caused by high winds outside were features of the January indoor flying session at the Arlington Recreation Building. The star of the show was the Farmen "Mosquito" by Mike Fedor - a very nice model and pretty flights. Ken Querman did a nice job of rescuing hung models with his telescoping retrieving pole. Ken and his pole have been a fixture at indoor contests for some time - the pole is built up in triangular sections about 5' long, and he can reach up to 40'after wayward models!

The February Cliff Model Club session has moved to the Drill Hall at Dallas NAS, where there is room to hold Indoor Scale, HLG and Indoor Stick all at once. The date is February 16, and the time from 9AM to 4PM. Sanction applied for.

HINTS AND KINKS

Refillable Hydrogen Balloons

Bill Bigge suggests that hydrogen from home generators be transferred from the receiving balloon on the generator to a vinyl beach ball. This makes it possible to transport extra hydrogen to the field, and has the added advantage of trapping water (from steam generated along with the hydrogen) in either the first balloon or in the beach ball.

Bill modifies both the beach ball and the balloon so that the balloon can be refilled after it loses enough lift to become unusable. The modification is as follows: Put a length of 3/16" O.D. tubing into the spout of the beach ball and seal it with the cap which used to seal the beach ball. Cut off most of the neck of the balloon and bind it to a short piece of plastic tubing. Seal the balloon with a cap molded from melted plastic - with care the entire assembly will be lighter than the original balloon. Now the balloon and the beach ball can be coupled together and the balloon can be refilled. (Editorial comment: My beach ball will store hydrogen about a week with 50% loss due to diffusion - hydrogen will diffuse through solid metal! The hydrogen loss from the beach ball is low because it is stored under low pressure.)

CHANGE OF PACE

The ILL EAGLE Ornithopter

by Jerald B. Murphy

An ornithopter, as defined by the Academy of Model Aeronautics, is an airplane that propels itself through the air by flapping its wings. The model presented here has been very successful in that it has set three indoor and one outdoor national records. Currently, it holds the Open Cat. II record of 2:10.0 and the open outdoor record of 6:13.0. The design is in need of some minor improvement, and I shall cover this later in this report.

Let us go on to the actual construction of the model. Because of the high power requirements of ornithopters, standard indoor construction cannot be used. A 10" motor tube is rolled in the usual way. After the motor tube is finished a 1/32" vertical sheet backbone is inserted the full length of the tube. The 6 3/4" tailboom is cut from medium 1/16" square balsa, and it is tapered to 1/32" square at the end. After the 1/16" x 1/8" x 5/16" thrust bearing support are added, the fuselage is completed. The fixed wing is not shown on the plans because it is so simple. It has a 1/16" square hard balsa leading and trailing edge with 1/16" square medium balsa end ribs and a 1/32" square medium balsa center rib. At the center rib, there is also a 1/16" square medium balsa stick that is mounted flush with the bottom of the wing. Gussets are added at all the leading edge points for strength, as this member must stand up under some very heavy loads. The stab and fin are built in the standard way, and may be covered with microfilm or tissue as desired.

The flapping wing is built up from 1/16" square hard balsa that has been tapered to 1/32" square at the ends. The gussets are 1/32" sheet. All the wire parts are .024" music wire and 1/16" O.D. aluminum tubing is used for the bearings. Mount two 3/8" long tubes on the end ribs of the fixed wing and be sure to mount them so as to build in the 10 degree downthrust. Cut five 5/32" and one 3/16" lengths of tubing. Mount the 3/16" length on the right hand flapping arm as a spacer, then slide four 5/32" lengths on the flapping arms and crank, to serve as bearings for the con. rods. The other 5/32" tube is cemented to the thrust bearing support. A standard indoor thrust bearing is flattened out and cemented to the front of the motor stick and thrust bearing support as shown in the front view. Now the crank and thrust washers are added and the rubber hook is formed after the crank is in place. The length of the con. rod is adjusted so that when the crank is vertical, the flapping wings are level.

I think the performance might be improved if the length of the flapping arms is reduced so that their length is the same as the distance from the leading edge of the fixed wing to the center of the crank; also, the pylon might be raised so that a longer crank might be used. The magnitude of the flap angle is not critical, but a flapping wing is more efficient at larger angles; however, ± 60 degrees seems to be the maximum.

Be sure to make the wings flap equal distances up and down and to make both wings flap the same. After covering wing (both fixed and flapping) with condenser paper you are ready for flying. The power is two 10" loops of .075 pirelli. The first flights are made on low turns. Warp the tailboom for trim. After a smooth flight pattern is achieved, start adding power and watch a crowd gather. Once, while flying at night under a street light, my model was pounced upon by a hungry cat!

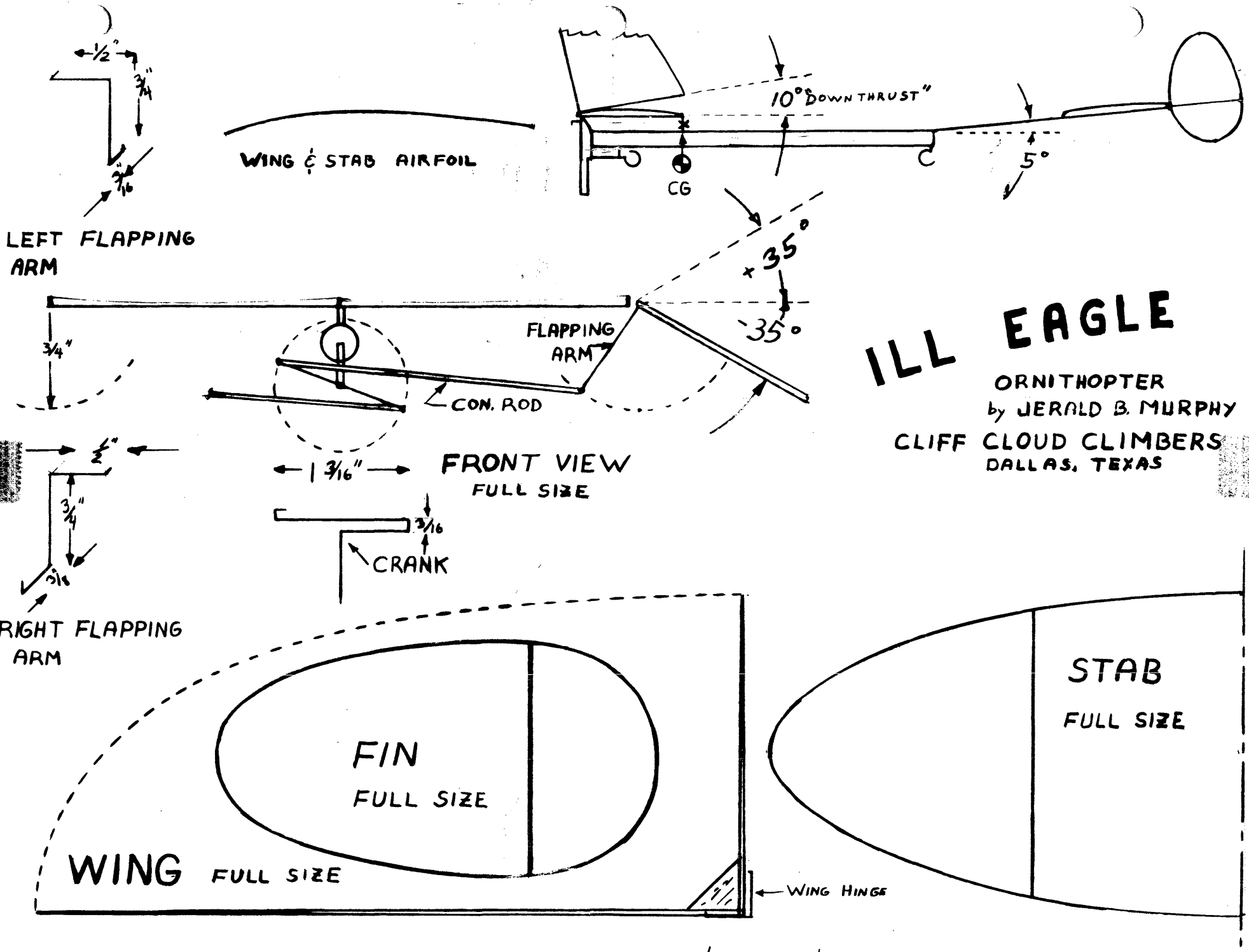
Your comments and suggestions on the ILL EAGLE are welcome, so please let me hear from you. My address is 410½ South West, Arlington, Texas.

STATE OF THE ART

The chart below summarizes all the information we have been able to gather about the models which topped the forty minute mark at the Nats and the FAI Semi-Flyoff last summer during the Nats. This presentation was made with the hope of making a meaningful comparison for those who take the theoretical approach to better performance.

The information presented has been furnished by the owner of the model, or "slip-sticked" from plans sent by the owner, or a combination of the two; they are largely correct and are presented with no intent of saying how to make your own "forty" - the chart shows several different ways of skinning that particular cat!

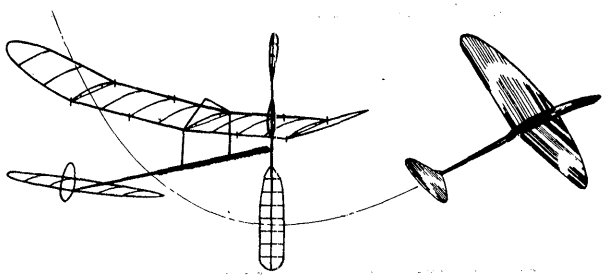
Model	Wing Area/ Aspect Ratio	M.A.C. inches	Stab % wing	Wt./Area oz./100 sq."	C. G. % chord	Model Wt. ounces	Rubber Wt. ounces	Prop	Tail Moment % span
Champine	186/7.0	5.15	38%	.019	70%	.036	.053	19 x 32	46.5%
Cummings	186/7.0	5.15	27%	.0185	40%	.0345	.0703	21 x 40	48%
Kopecky	216/6.0	6.0	27.5%	.0179	68%	.039	.039	18 x 30	50%
Stoll	192/6.6	5.4	37%	.0195	80%	.0375	.054	19 x 35	46%
Kowalski	180/7.1	5.05	41.6%	.0195	83%	.0355	.044	19 x 33	52%



drawn by: J. B. MURPHY 11-27-63

The Voice of N.I.M.A.S. MAR · 1964

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New members who joined in February:

LEONARD A. DANBER, 3354 W. 61st. Pl., Chicago, Ill. 60629
JOHN J. WALZAK, c/o Dunham Hall, 1213 Court St., Utica, New York
EDMUND S. WHITTEN, Box 176, Wall Street Station, New York 5, New York

NIMAS Awards

Two comments were made last month on the Award times for IHLG as suggested by Chuck Borneman. Charlie Sotich felt that the Silver and Gold award times should be spread out some:

	Cat. I	Cat. II	Cat. III
SILVER	0:24	0:45	0:55
GOLD	0:30	0:55	1:05
DIAMOND	0:36	1:05	1:15 (no change)

Lee Hines suggested that the Diamond Award times be 0:40, 1:10 and 1:20; remarking that only the Cat. II time had been achieved. This brings up the question of what the intended purpose for the NIMAS Award system should be - an award for performance not necessarily record breaking but well above average; or an award for a set standard of performance which keeps pace with the state of the art. Which should be the goal? Sound off!

Back Issues?

Back issues are still available to NIMAS members for 35¢ handling charge; to INAV subscribers the charge is 10¢ per issue. A complete set dating from November 1962 is available for the asking - plus the appropriate amount in stamps, of course!

Two complete sets of Richard Miller's "The Hand Launch Glider" are also available, along with several incomplete sets - first come, first served - 15¢ and 10¢ respectively (for postage and handling).

New Materials!

Some time ago Bruce Paton suggested that Dacron cord such as that furnished for control lines with ready-to-fly plastic models could be split down to very fine strands to be used for bracing indoor models. This idea prompted my query to du Pont about monofilament Dacron.

Thanks to the generosity of Mr. V. S. Van Scoy of E. I. du Pont de Nemours & Co., I have a large sample of Dacron monofilament for evaluation as bracing material. The sample is a 250 strand bundle of monofilaments, each strand of which is .0008" in diameter. One strand has sufficient strength for most bracing jobs, but the bundle can be separated into threads containing several strands just as easily. The main advantage to using multiple strands is the better visibility of the larger thread.

The reason for testing Dacron is that I expect it will be easier to see and easier to use than wire - with no weight penalty. If you want a sample to test, send a stamped, self-addressed envelope to Bud Tenny, Box 545, Richardson, Texas 75081, and I will send you some.

FAI INDOOR REPORT

The slight uncertainty over whether Cardington airshed would be available for the '65 World Indoor Championships has been dispelled by the announcement that the event will be co-sponsored by the A.M.A. and the S.M.A.E. No announcement of the date has been made so far.

INDOOR RULES

A recent report by Bruce Paton, West Coast member of the Indoor Rules Committee, indicates that the majority of indoor fliers in his area have the following opinions:

1. Paragraph 4.7 in the AMA Rules Book should be revised to permit indoor models to be wound by an assistant.
2. There is no real reason for changing either the number of indoor model classes or the method of classifying indoor models - that is, they favor no changes in the existing indoor rules.
3. Easy B or similar "beginner classes" have no place as an AMA record class, but should be retained on the local level.

Since there is such a widespread difference in opinions among indoor fliers across the United States, considerable effort is being expended toward completing a questionaire to be sent to all indoor fliers. This will help the Indoor Rules Committee to sample the feelings of all fliers who complete the questionaire, and should give a good picture of the whole indoor activity. The questionaire will be available sometime after May 1, 1964, and all fliers are urged to participate.

Glider Fliers, Beware!

If I've kept proper track of the time schedule, March is the month that the final vote will be taken on the Detroit-Chicago-Wilmington IHLG Proposal (will require solid wood construction on IHLG). If you feel that this proposal is unnecessarily restrictive, the time is short for you to make your feelings known. Consult the 1964 AMA Rule Book or the Dec. '63 MODEL AVIATION for the address of the Free Flight Contest Board member for your AMA District, write your objections to the proposal and get it in the mail. And, if you favor the proposal, send that opinion in. See the Dec. '63 issues of INDOOR NEWS or MODEL AVIATION for the text of the proposal.

My personal feeling about the proposal, from a CD's viewpoint, is that the rule specifically outlaws all built-up structures (not just microfilm gliders as was the intent), clay and metal noseweight, and monofilament or wire leading edges. As a contestant, the rule keeps me from experimenting with new materials for honest-to-goodness thrown gliders - it says I have to use wood - "solid wood throughout"!

If we reject this rule, we will be right where we were late in 1960 - certainly through no fault of the present Contest Board. Although we have no relief on Cat. II and Cat. III records (four of the six records are held by "mike" gliders), most CD's have learned to outlaw microfilm gliders at their contests. My own feeling is that we ought to do it right - even if it takes another year to do it.

INDOOR FLYING SCALE

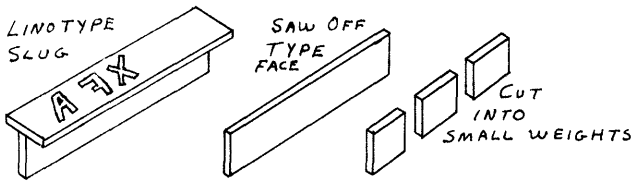
Indoor scale fliers on the West Coast have a busy Spring season set out for them. This schedule appeared in the March N.A.A. Flightmasters Flying Scale News & Views:

March 13 - Indoor Flying Scale Annual at Wilmington Recreation Center.
April 5 - Santa Ana Indoor Flying Scale Meet at Santa Ana MCAF hangar.
May 8 - Indoor Flying Scale meet at Wilmington
May 15 - Cross and Cockade - AIAA Auditorium, Beverly Blvd. in Hollywood across from Pacific Auditorium. WWI speaker and movies of WWI aircraft. Donation $1.

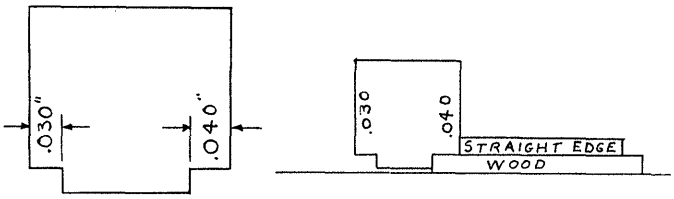
HINTS AND KINKS

Three Building Hints

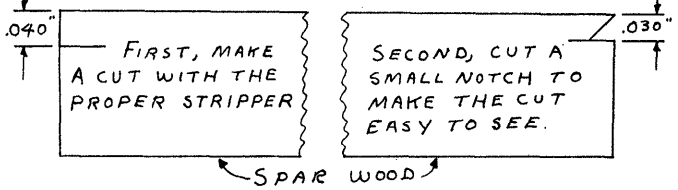
Dave Linstrum suggests a handy source for small building weights: Get some used linotype slugs, saw off the type face and saw the remaining slug into pieces about 3/16" x 1/2" x 3/4". Finally, glue small pieces of garnet paper to the weights to keep them from slipping around on the board (lead is slick when sawed).



Paul Crowley suggests this method for making matched sets of tapered spars: If the spars are to be double tapered, first sand one taper into the sheet of balsa, then use a gage like that shown below to line up the straight edge to the proper distances from the edge of the balsa. The gage shown makes spars which taper from .040" wide to .030" wide.



If you happen to have some balsa strippers around, they can be used in place of the gage shown above to make tapered spars. Taper the balsa sheet just as outlined above, then make a short cut with strippers of the proper size at each end. In the example sketched below, the desired spar tapers from .040" to .030", so make a short cut with a .040" stripper at the heavy end of the wood and a cut at the opposite end of the wood with a .030" stripper. Now, notch from the edge of the spar down to the stripper slot so that spar dimensions are clearly defined, place the wood on a dark background, and align the straight edge with the bottom of the notch to cut the spar. This gives spars with a bevel on the end which helps you to orient the spars properly when splicing.



NEWS FROM AROUND THE WORLD

CALIFORNIA - SANTA ANA

The March SHOC record trials are going on as we go to press, but plans are firm for the April 5 open indoor contest in the Santa Ana MCAF hangar. Bruce Paton expects well over 100 indoor entrants plus a very large indoor scale entry.

FINLAND - HELSINKI

Finnish indoor activity has been understandably low during the winter months - their November meet had freezing temperatures and high drafts in their 45' hall. The highest time of that meet was 16:10 by L. Englund, and Esko Hamalainen came in second with 13:38. R. Hyvarinen followed close behind with 13:22. Pretty good times for that weather! Esko says that their FAI team selection will begin in May, and that quite a few more modelers are showing interest in indoor this year.

ILLINOIS - CHICAGO

The Chicago Aeronuts February contest (7th Annual) had 25 contestants who made 33 entries in 5 events. Jeff Nakashima won Jr. HLG with 0:32.4 and Jim Thornberry won Jr. Easy B with 8:22. Open event winners were: HLG - 1:04.5, Bob Larsh; Paper Stick - 13:12.2, Bob Larsh; Microfilm Stick - 20:28.0, Bob DeBatty. The next Aeronut contest will be March 21, 1964; events will be HLG, Easy B, and a special event for rubber kit models with 24" maximum span.

INDIANA - KOKOMO

A last minute deal forced postponement of the Kokomo Aero Team's February meet until March 1 - and probably the March contest will remain scheduled for March 15. Just in case you're planning on attending, contact Chuck Borneman at 1401 West Taylor, Kokomo, to make sure the event is still on. These meets at Bunker Hill AFB are always well attended and competition is keen.

MASSACHUSETTS - M.I.T.

Eric Greenwell's last-minute letter didn't make it in time to let us know that the February contest was cancelled. Oh, well! The March session is still set up for March 21, from 4:30 PM to 8:30 PM in the MIT Armory on the corner of Massachusetts Ave. and Vassar St. Just in case, check with Eric at Box 5031, 362 Memorial Dr., Cambridge, Mass. 02139.

MICHIGAN - ANN ARBOR

The Ann Arbor Airfoilers held an indoor session in a school gym (20') last month. Most of the activity was with HLG, but Clarence Mather and Don Drury gave a demonstration with tissue covered models similar to Easy B's. This demonstration was so successful that an encore is planned in March. A building instruction session will be held a week before the flying session to assist the club members in preparing models for the session. The Airfoilers are to be congratulated - this is the kind of effort which helps our hobby to grow!

NEBRASKA - LINCOLN

The Sky Knights of Lincoln will hold their second annual indoor contest on March 15 at the University of Nebraska Fieldhouse. This site has 45' ceiling with 80' x 135' floor area - if the drift is low it ought to be a good site. Events are HLG, Paper Stick and Mike Stick, and trophies are offered for prizes. Contact Walter Erbach, 2979 Dudley, Lincoln, for more details.

NEW YORK - ORANGEBURG

When the Rockland State Hospital gym finally became available, Sid Bernstein and fliers from near and far put it to good use with frequent sessions. The models flown have ranged from scale models through Easy B and HLG. Contact Sid Bernstein, c/o Research Facility, Rockland State Hospital, Orangeburg, New York for times of these sessions.

PENNSYLVANIA - PITTSBURGH

Ron Ganser has been doing a good job at promoting indoor flying - he has frequent access to a pretty fair site, and he has been appointed indoor representative to the Alleghany Model Aeronautics Council.

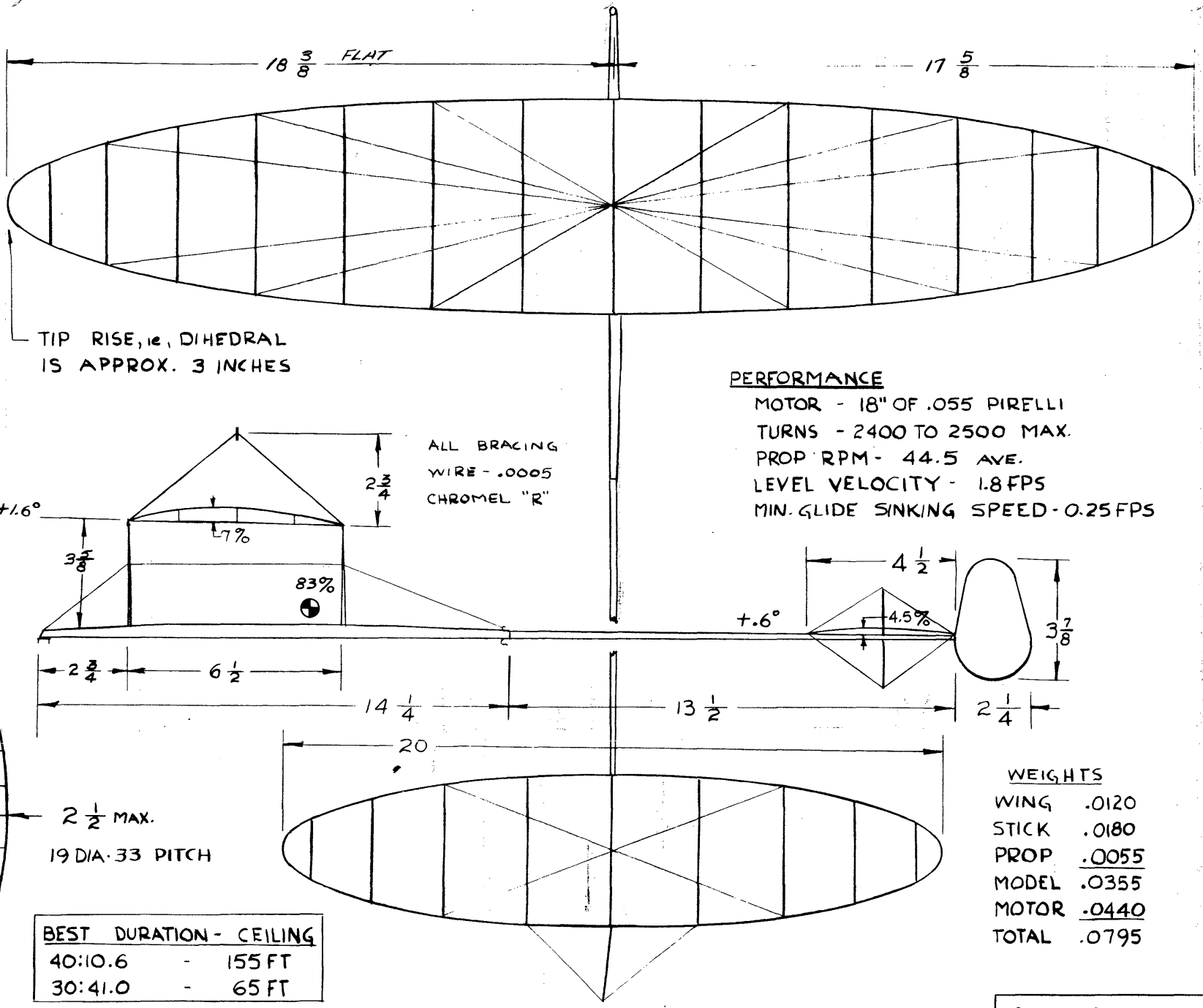
Ron's site is the pumping station where he works - it was converted from steam pumps to electric, which left a floor area 60' x 100' with 53' ceiling. Retreiving equipment is the best available - a twenty-ton overhead crane! Ron lowers a hook on a string from the crane to lift his models off the heater! Ron's address: 2500 Mission St., Pittsburgh, Pa. 15203.

TEXAS - FT. WORTH-DALLAS

The February Cliff Model Club contest was well attended by truly fierce competitors. The results: Paper Stick - 7:52.8, Casey Hornbeck; 7:17.9, Jim Clem; 7:08.5, Mike Fedor. HLG - 0:37.8, Mike Fedor; 0:34.1, Bud Tenny; 0:33.5, Jim Hardin. Indoor scale - 69.6 pts., Jerry Murphy; 58.4 pts., Casey Hornbeck; 57.2 pts., Mike Fedor. The CMC March session moves back to the Arlington Recreation Center on March 15, 1:30 PM to 5:30 PM.

STATE OF THE ART

The model featured this month raised the U. S. competitive standard to 40 minutes by winning the '63 Nats with 40:10.6. This unusual design is a radical departure from the usual indoor practice, with some different features. The covering - mostly straw colored film - is tight and smooth on the elliptical dihedral stressed wing. The 83% CG location emphasizes the long tail moment and large stab. During ground handling, the tail boom flexes noticeably. In response to my query, Dick said, "The tip rise on my Nats model was 3", give or take an eighth of an inch depending upon variables of weather and film tightness. The tail boom elasticity is not necessary, but is very helpful for models such as mine." This model has a very high initial rate of climb - and it peaks out in about nine minutes of a forty minute flight. A few extra turns could easily put the model too high - so the turns are very carefully counted! Tracing by Casey Hornbeck.



PERFORMANCE

MOTOR - 18" OF .055 PIRELLI
TURNS - 2400 TO 2500 MAX.
PROP RPM - 44.5 AVE.
LEVEL VELOCITY - 1.8 FPS
MIN. GLIDE SINKING SPEED - 0.25 FPS

BEST	DURATION	-	CEILING
40:10.6		-	155 FT
30:41.0		-	65 FT

WEIGHTS

WING	.0120
STICK	.0180
PROP	.0055
MODEL	.0355
MOTOR	.0440
TOTAL	.0795

1963 NATS WINNER
BY KOWALSKI

C

QUESTIONS AND ANSWERS

29. Can you tell me how to make scales to weigh my indoor models?

Scales for indoor models are easy to construct, and pretty fair accuracy can be obtained if accurate weights are used with care. This article will deal with two types of scales: beam scales and spring or deflection scales.

The basic beam scale follows the geometry of Figure 1, where "A" represents the force exerted by the object to be weighed, "F" represents the Fulcrum or pivot, "B" represents the force exerted by the standard weight and "X" and "Y" represent the distances from "A" to the fulcrum and from "B" to the fulcrum respectively.

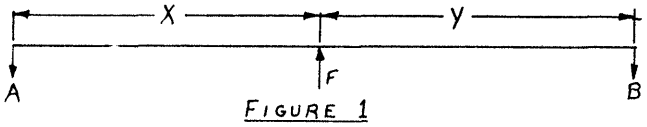


FIGURE 1

The force diagram of Figure 1 will be in balance if: Force A x Distance X = Force B x Distance Y. If A = B, X will equal Y at balance. If A = 1/2 B, then at balance Y = 1/2 X as shown in Figure 2.

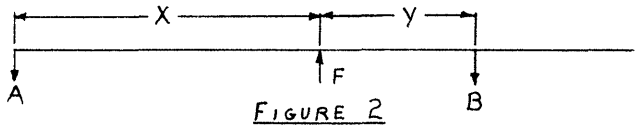


FIGURE 2

Figure 3 details a practical application of the beam balance principle which will yield a sensitivity better than 20 micro-ounces and a repeatability better than 1%. Briefly, it is a beam which pivots on a Shick razor blade in two music wire pivots. A base plate mounts the pivot support on one end and wire loop to limit beam movement on the other end. Counterbalance weights "A" are trimmed until the C.G. of the beam assembly lies just below the pivot. (If the C.G. is higher than the pivot, the beam will have no stable position and cannot be balanced) "B" is a sliding weight which serves as a coarse adjustment on beam balance, while "C" is a 4-40 bolt which is used for fine balance of the empty beam. Two hooks on the left side of the beam permit distance "X" to be 5" or 10" and the "Y" distance can vary from 1" to 15". Note that Figures 4 & 5 give additional details of the construction of the scale. Note especially the small notch at each 1" mark, which should be very accurately cut for the best results.

My set of weights for this scale include the following: .05 oz., .02 oz., .01 oz., .005 oz., .002 oz., .001 oz. and .0005 oz. These weights make a practical range of measurement from less than .0001 oz. to more than .2 oz. by using a combination of weights. Accuracy is at least 1%, since each of the weights is correct to at least .2%.

Typically, a weighing is made as follows, assuming an object weighing just over .01 oz.: Balance the scale until the wire pointer travels up and down in equal arcs within the beam guide. Hang the part you're weighing on the outer hook, and place the .01 oz. weight on the right beam. With the weight in the "10" notch the beam rises to the upper stop; at "11" the beam falls to the lower stop. The weight is moved back to "10" and the .001 oz. weight is placed at "4". The beam falls, but it balances with the small weight between 3.5 and 3.75; "guesstimation" makes it 3.6.

The total weight is computed thus: Since the .01 oz. weight is at 10, this stands for .01 oz.; the other weight is computed as .36 x .001 oz. The total weight is .01 + .00036 = .01036 oz. Common sense tells us that the weight should be recorded as .0104 oz., since the quoted accuracy is 1%. However, if the scale is carefully balanced for each weighing (changing humidity causes large changes in beam balance), the repeatability is at least .1% and the figure .01036 would have meaning for your own notes.

My set of weights are based on the .05 oz. weight, which was made correct to .05% with the help of a chemist and very sensitive laboratory scales. The .02 oz. weight was then made on the scale by comparison techniques. Each successive weight was made in the same manner from the next larger weight and the entire group was then weighed on sensitive laboratory scales as a final check.

Figure 6 details a deflection scale built to check prop weights at the flying site. The basic principle is that an elastic beam (in this case a piece of music wire) always deflects the same amount whenever a given load is placed on it. This scale was made by mounting a piece of .010" music wire on suitable supporting structure as in Figure 6, (dimensions are not critical) and calibrating the deflection directly on the scale. In similar fashion a piece of .020 wire makes a scale which weighs up to .1 oz. for weighing rubber motors.

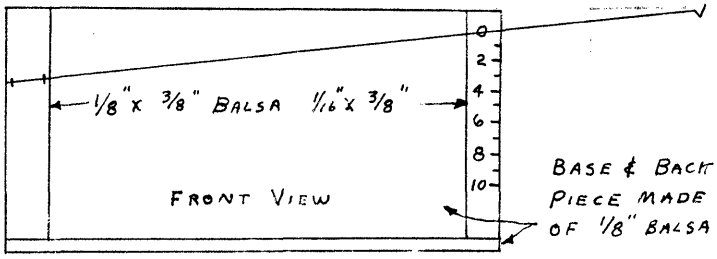


FIGURE 6

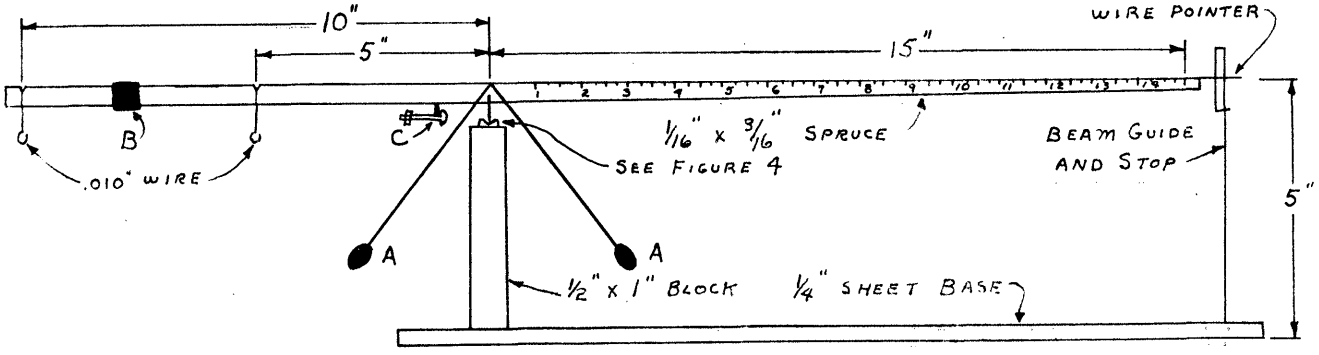


FIGURE 3

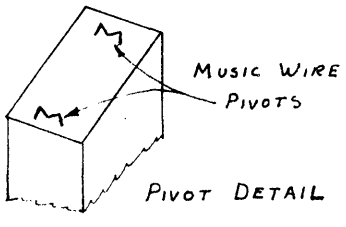


FIGURE 4

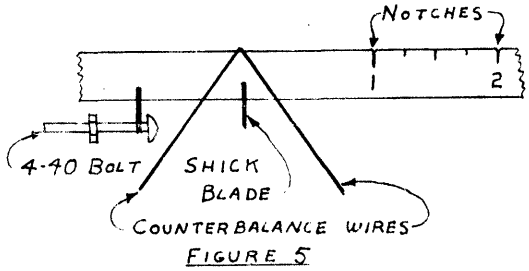
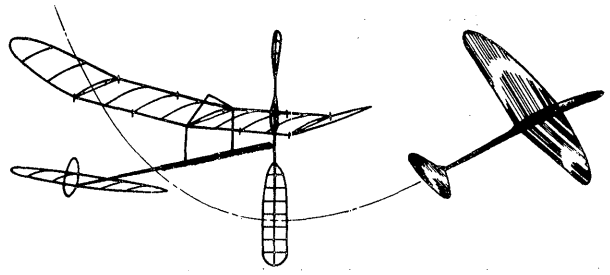


FIGURE 5

The Voice of N.I.M.A.S. APR·1964

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members

BILL ATWOOD, 1760 Palm Drive, Laguna Beach, California
NORMAN G. BICKAR, 649 Jefferson Rd., Pittsburgh, Pa.15235
BOB CLEMENS, 605 N. Columbia St., Naperville, Ill. 60540
ROBERT GILCHRIST, 89 Silver Spring Rd., Ridgefield, Conn.
KENNETH JOHNSON, 3089 McRoberts Rd., Pittsburgh, Pa.15234
GERALD KNOBLAUCH, 6150 West 54th St. Parma, Ohio 44129
JULIUS A. RUDY, 3218 Revere Rd., S. Plainfield, New Jersey
THOMAS SCHMITT, 11014 Marcliff Rd., Rockville, Md. 20852
IRVING SHERMAN, 131 Magazine St., Cambridge 39, Mass.
THOMAS VALLEE, 5600 54th. Ave., Apt. 204, Riverdale, Md.

1964 Nats!

The 1964 Nats will be held in Dallas, Texas, on July 20-26. The Indoor Nats will be flown in Will Rogers Coliseum as in past years. This site has floor area 125' x 150' and an arched roof with peak at 92' and eaves at 70'. I have no personal experience with obstructions (I understand there are lights at 65') or conditions during the day. If anyone can comment on flying conditions, it will be appreciated and passed on to everyone.

N.I.M.A.S. Display

Last week in Dallas the Dallas Recreation Department played host to conference of city recreation heads from many cities in the Southwest. Since the regular Dallas Cat. I site, Walnut Hill Recreation Center, is part of the Dallas recreation facilities, we were asked to build a display of indoor models. After considerable thought, we made a showcase from an 18" x 23" x 12" cardboard box. The top and front of the box were removed, the opening was framed with 1/8" x 1/2" spruce strips, the entire box was painted flat black, and the open spaces covered with celluloid. An 18" microfilm model and an Easy B were assembled and mounted inside on stands and small cards with descriptive commentary was placed by each. On the outside of the display case was placed a card giving general information about indoor models along with a plug about how this type of activity will work into recreation programs.

This type of display could be set up many places in those areas where you are trying to promote indoor models. If there is a large hobby shop in your town - one which draws a lot of different fliers who don't know about indoor models, such a display could help your group to grow. Include a name and telephone number of someone who could answer questions and have a listing of times and dates of flying sessions if you have regular sessions.

More on Dacron

Since last month, quite a few people have been sent samples of monofilament Dacron to test, but only local reports are available. So far, two "A" ships, a "C" stab and a B Paper ship have been braced, and the material is very easy to work with. If a single strand is used, the visability is no worse than with .0007 Karma wire or .005 nichrome, and the dacron does not kink. The offer is still open (indefinitely) - if you want a sample or a second sample, send a stamped, self-addressed envelope and I'll oblige.

Meanwhile, Mr. Van Scoy of duPont has become very interested in indoor models and would like to see an indoor model. If anyone lives near the duPont plant at Wilmington, Delaware, and would be able to show him a model, please drop me a line.

A Reader Writes!

Dear Bud,

Here's a trick for covering with microfilm - use beer instead of saliva. In fact, use a dilute solution of beer.

This trick is based on fact. Saliva contains many enzymes that will digest starches first, proteins second, and sugars last. Because of this digestive action saliva digests a portion of the acetate film and makes it gooey enough to stick to the framework.

Some years back the beer manufacturers were troubled by starches, proteins, and sugars that went out of solution and formed a colloid when the beer was under refrigeration. This colloid made the beer look like the bottom of a river, so the beer people added minute quantities of an enzyme to dissolve the gunk and make the beer see-throughable. Those same enzymes are what makes the film stick to the framework.

(signed)
April Fool

FAI INDOOR REPORT

FAI World Championship

The time schedule for the FAI Indoor World Championship event has been announced as follows:

Friday, Sept. 11	2:30 PM to 6 PM (practice)
Saturday, Sept. 12	10 AM to 6:15 PM (first round)
Sunday, Sept. 13	10 AM to 5:15 PM (second round)

Due to the quite short practice session set up for Sept. 11, Dick Kowalski has requested earlier access to the hangar for this purpose.

Team Member Activity

Bill Atwood and Frank Cummings have been flying at Santa Ana and both report flights over 40 minutes. Ed Stoll utilized the poor winter weather to build up parts for six models. Since warmer weather has returned, he has flown at least three weekends - mainly getting back in practice.

INDOOR RULES

Rules Committee Action

The Indoor Rules Committee was busy early in March on two important projects. First came the status report marking the end of the first six months of committee existence. This report was made to Phil Klintworth, who added a supplemental report and turned it over to AMA for publication in the May issue of Model Aviation.

The second item of business was the completion of an indoor rules questionaire which will be printed in either the May or June Model Aviation, as space allows. It is important that all indoor fliers fill out the questionaire so that the Committee can get a wide sampling of opinions and ideas.

RECORDS? MAYBE!

UNION MODEL AIRPLANE CLUB RECORD TRIALS, March 26, 1964
CAT. I, Union High School Auditorium - 30' ceiling
Sr. Autogyro - 2:21, Edmund Smith
Sr. Ornithopter - 2:41, Edmund Smith

PROP FORUM

Bob Champine designed the prop shown on our full page spread and furnished the information shown there. This prop's only test to date gave Bob 36:12 on less than full winds at Lakehurst - pretty good time!

Using this information, we can examine the step-by-step procedure used in producing a top-notch propellor. If the method seems a little detailed, remember that the prop is what transforms stored energy in the motor into kinetic energy which powers the model. Any shortcuts in prop construction is quite likely show up as shortcuts in flight time!

Each component of the prop should come in for special attention, to insure that both blades are the same size and the same flexibility. This insures equal blade flare and smooth running throughout the whole flight.

Start with the spar. Cut two identical strips in your favorite manner - either tapered or constant size - and splice them in the middle. Sand the spar smooth and round it if you use rounded spars, them check both ends of the spar for equal deflection in all directions as outlined in the Hints and Kinks column. Keep working until both sides are alike - this is the most important step! Now form the hook and attach it to the spar, and make sure it is exactly perpendicular to the spar.

Both blade outlines should be made at once from identical strips of wood. If you use the small retaining strips glued to your prop block as shown in the sketch, the strips can be formed in one step, but it is better to form both at once on a separate form. Soak the strips in water, place on the form, and bake in the oven. Move the strip to the block, wet it again, and bake it again.

Make all the ribs in pairs, one pair for each station on the blade, and assemble the first blade on the form. Let the glue dry thoroughly (use the oven if you're in a hurry), remove the prop from the form, reverse the spar, and assemble the second blade. To cover the prop, remember that the blade outline gets wet while covering, so return the blade to the block after you trim it. Let the blade dry thoroughly before covering the second blade, and repeat the drying process on the block.

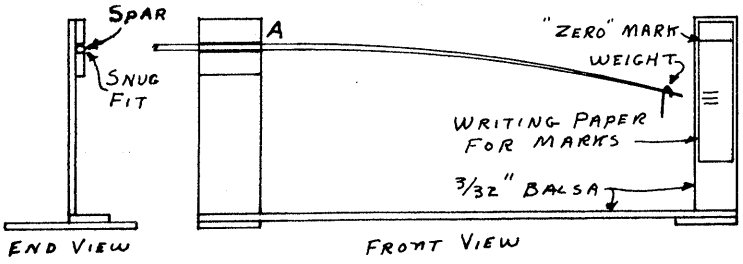
If you keep notes on weights and materials of your models, the following information should be recorded: Density of the spar wood and dimensions (diameter) of the spar at 2" stations out to the tip. Wood density and cross section size of the blade outlines. Wood density and material thickness of the rib material. The weight of the finished spar; the deflection and weight used; and the weight of the hook should all be recorded. The weight of the finished prop before and after covering may also be useful as reference later. Finally, if you have many similar props, code the prop somehow so that there is no mistake on the pitch and diameter. I use dots representing the last digit of the pitch and diameter - for example a 14 x 28 would have 4 dots on one blade and 8 dots on the other.

HINTS AND KINKS

A Building Hint

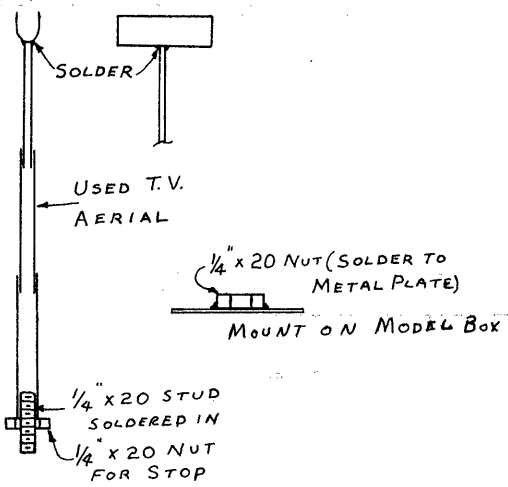
Reggie Batterson took to heart Bob Champine's suggestion for checking prop spars and designed this jig to aid in the check. The stand itself is simple and the dimensions are not critical, except for the snug fit at the spar hub.

In operation, the partially finished spar is checked for deflection with a weight (Bob and Reggie use a .009 oz. weight), then the spar is rotated to make sure the flex is the same in all directions. Finally, the spar is reversed and the deflection of the second end of the spar is sanded until the deflection in all planes equals that of the first end. A word of caution - the slot at "A" must be horizontal for best results, and the spar must not "rock" at all.

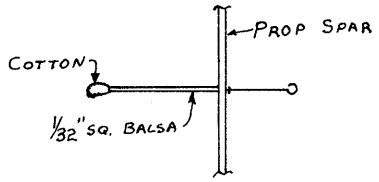


Two Flying Kinks

Clarence Mather designed the adjustable run-down stand shown below. Starting with a collapsable antenna (from the TV set if you're quick enough), solder a cradle on top (line it with thin sponge) and a 1/4-20 stud in the other end. Solder a 1/4-20 nut to a metal plate an mount it on your model box. This stand telescopes to about 12" length for carrying, is adjustable in height, and the model can be turned through 360 degrees to assist field repairs.



Clifford McBaine suggests the following method to help control the climb for low ceiling fliers: Mount a 3" long piece of 1/32" square balsa on the front of the prop and put a small ball of cotton on the end. Trim the cruise portion of the flight with the cotton in place, but dry. Wet the cotton with a measured amount of water, which will hold the nose down during the burst and yet will evaporate for the cruise, restoring normal trim.



QUESTIONS AND ANSWERS

30. How do you find the density of unmarked balsa wood?

The density of wood is usually expressed in terms of pounds per cubic foot, and even marked pieces may vary slightly from the marked value. This is because the wood is usually cut into standard sized blocklets which are weighed and the resulting density read from a chart which has been prepared for that size of block. Since balsa density often varies quite a bit from one side of a block to the other, individual sheets from the same block may vary as much as 20% in density.

To grade an individual sheet of blasa, it must be weighed and the physical dimensions of the sheet measured so the volume can be computed. A particular piece of 3/32" balsa measured 2.125" x 18" x .105", which makes 4 cubic inches. The weight checked out at .159 oz as weighed on the beam scale featured in the March INAV. Incidentally, this scale's versatility was extended by putting hooks on the unknown beam at 2" and 3" and making a .1 oz. weight.

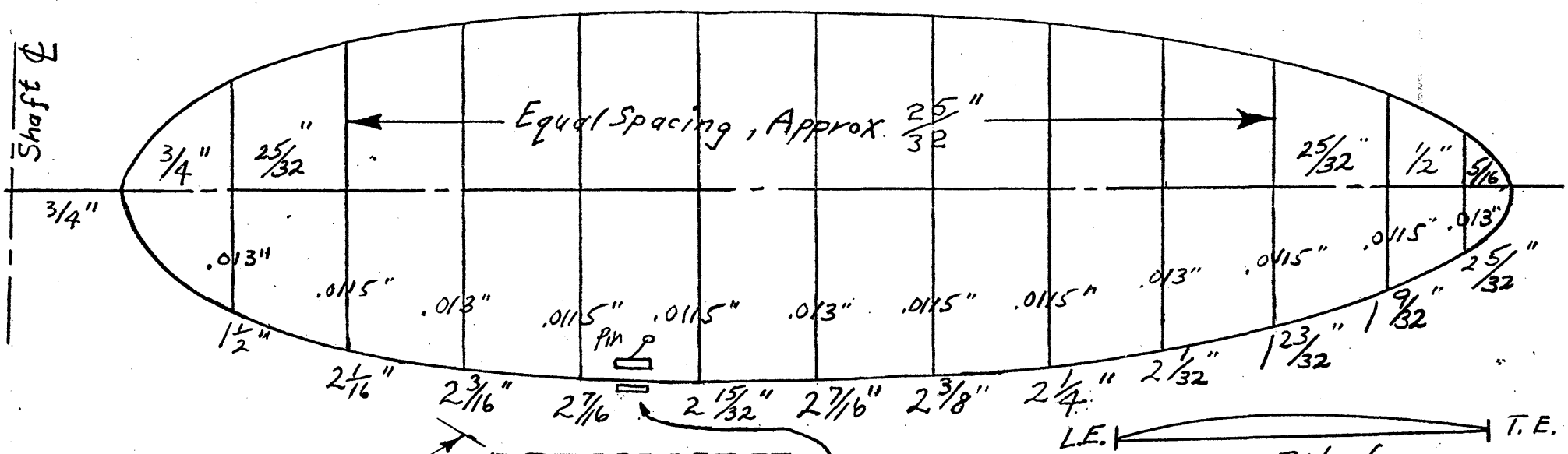
Since we now have the volume of wood and the weight, it is a simple matter to figure the weight per cubic inch:

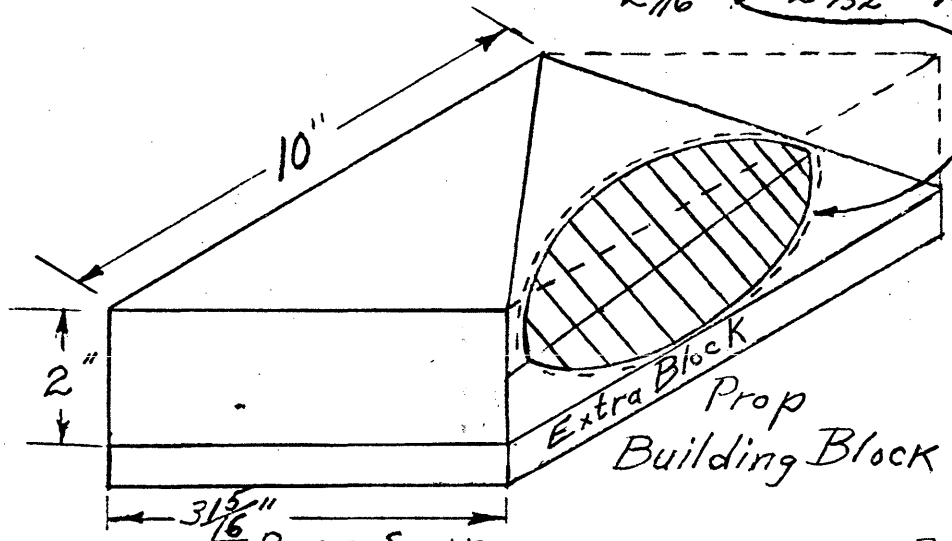
$$\frac{.159\ \text{oz.}}{4\ \text{IN.}^3} \times \frac{.25}{.25} = \frac{.0398\ \text{oz}}{\text{IN.}^3}$$

Note that the second expression in the equation is chosen so that the denominator becomes unity and so the numerator is numerically equal to oz./cubic inch. Now, multiply this number by 108 cubic inches/oz. to get 4.3 lbs./cubic ft. The number 108 is derived by expressing the number 1 pound/cubic ft. as 16 oz./1728 cubic in. and inverting the expression to get 108 cubic in./oz. This divides out all the units and gives a dimensionless number 4.3, which represents pounds/sq.in. This procedure takes but a few minutes for each sheet of wood, but is almost essential if you hope to build the lightest models practical for your site and flying conditions.

Bob Champine's Indoor FAI Prop. 20" D. x 32" P.

Outline .025" x .028"



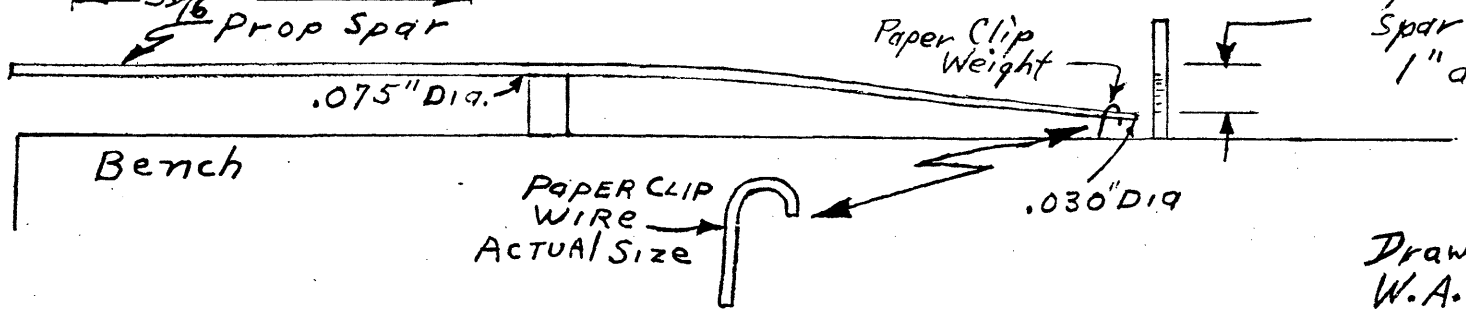


1/32" x 1/32" x 1/4" blocks glued between ribs to hold outline inside. Pin 1/32" x 1/4" on inside of outline to hold outline in place. Wet, then bake again @ 130°F. for 30 Min.

Ribs from .013" & .0115" Sheet
Approx. .020" Wide

Weight oz.

Spar .003
Spar, Shaft, one blade .005
Total (No Mike) .0065
Total (Complete) .007



Drawn
W. A. Lindsay 2/16/69

WE GOOFED!

In the "ILL EAGLE" article in the Feb. '64 issue we left out a few words which caused one reader considerable inconvenience; sorry to cause trouble, but at least we know that someone read it! In the first paragraph in the right-hand column of page 4, the sixth sentence should read: "After the 1/16" x 1/8" pylon and the 1/16" x 1/8" x 5/16" thrust bearing support are added, the fuselage is complete." The missing words are underlined above - I hope that clears up why the flappers flapped up too far!

A LOOK AT YESTERYEAR

For some time now, I have had the fond hope that we could indulge in a bit of looking over our shoulder to see what has gone on before. After all, indoor flying was once just about the most popular form of modeling, and the NIMAS membership roster includes a lot of people who were on the scene as our hobby took shape. How about sharing some recollections, historical notes and anecdotes out of the past? For example:

Merrick "Pete" Andrews flew a "C" in Lakehurst #5 and became the first man to top 30 minutes; his flight lasted 32 minutes and 19 seconds. Almost everyone knows about that flight, but who was the first to top 10 minutes in the days when 5 minutes was a long flight and anyone who had a winner promptly covered it up to keep anyone from finding out his "secret" and beating him?

Joe Bilgri was the first to pass the 20 minute mark in Cabin; he is still with us and has nearly passed 30.

Early issues of Model Airplane News credit Bob Clary with developing microfilm around 1930 while he was a student at M.I.T. Some early basic solutions were:

1. Two parts Ambroid thinner, 4 parts collodion, and ten parts bronzing liquid.
2. One part collodion, five parts bronzing liquid.
3. Four parts collodion, one part Ambroid, twenty parts nitrate dope.

The first advertisement for commercial microfilm appeared in the January 1934 issue of M.A.N.

LOW CEILING FORUM

If you belong to the school that says that indoor gliders fly better with a finish, but you are afraid of the added weight, this is for you. After sanding your latest creation with the finest worn-out sandpaper you can find (the new Flex-I-Grit mylar backed sandpaper never seems to wear out, but it has some mighty fine grit to help make up for that), you are ready for the finish. Thin Testors' Butyrate Dope Hot Fuel Proof Sanding Sealer 50% or more with acetone, brush some over a small area and rub it in with the fingers. Repeat until the whole model is covered, and let dry a couple of hours. Sand off the resulting fuzz and you are done. Your glider will be smoother and stay that way, it has some measure of humidity resistance (in case you are forced to fly under the street lights at times), and the glider is less prone to pick up weight from handling. Also, unlike some finishes, the wood stays flexibile.

What about the extra weight? I made a 33 sq.in. Cat. I glider recently which had this treatment. The finished weight was .108 oz., and the wing gained .001 oz. from the treatment. If you try it, let me know what you think.

NEWS FROM AROUND THE WORLD

CALIFORNIA - LANCASTER

Jim Kelly and a growing group of lucky fellows have been flying in the Weights and Balances hangar at Edwards AFB most every week-end. To top off this activity, Jim has applied for a record trials sanction for April 19. He also is working on clearance for similar events for the following dates: May 24, June 21, July 26, Aug. 23, Sept. 20, Nov. 22 and Dec. 20. Each date is two weeks after the record trials at Santa Ana and should round out California activity nicely. The hangar is 93' high and has good air about one day in seven, says Jim. Contact him at 44246 N. Cedar, Lancaster, Calif., for more info.

CALIFORNIA - SANTA ANA

One end door of the hangar was open 3' due to a broken wheel while the Sky Hoppers were trying to hold their April open contest. Although the scale events and HLG were held in the relatively calm air at the far end of the hangar, someone discovered that the wind at the open door was enough to fly a kite! Top HLG time was 1:15.8 by Ken Happersett, followed by 1:13.4 - Curt Stevens and 1:12.8 - Lee Hines. Anyway, they will try to hold the contest again on June 7.

ILLINOIS - CHICAGO

The Chicago Aeronuts March contest had 27 contestants who flew in six events. Top times were: Jr. HLG - 0:42 Randy Helmick; Open HLG - 1:03.9, Bob Larsh; Jr. Easy B 8:57.6, Jim Thornberry Jr.; Open Easy B - 11:03.9, Bob Larsh; Jr. Rubber (Kit) - 0:35.1, John Kerrigan; Open Rubber (Kit) - 1:43.0, Bob Yurkowski. Even though built up props were permitted on Easy B, this is real good time for paper covered Easy B!

If enough fliers want to support another contest, the Aeronuts will hold another one soon. If you are interested, drop Pete Sotich a line at 3851 West 62nd Place, Chicago, Ill. 60629

INDIANA - KOKOMO

The March 15 session at Bunker Hill AFB had a few less contestants than usual, but the action was quite adequate. Top times: Open HLG - 0:41.8, Bob Larsh; Jr. HLG - 0:34.0, Billy Haught; Open Easy B - 8:12.7, Jim Pulley; Jr. Easy B - 4:39.6, Tom Ersted. The last indoor session for the Bunker Hill site this year will be held on April 19. Contact Chuck Borneman for more details of the meet - 1401 West Taylor, Kokomo, Ind. 46901.

MASSACHUSETTS - M.I.T.

The MIT session for April is scheduled for April 18, 4:30 PM to 8:30 PM in the MIT Armory. Contact Eric Greenwell at Box 5031, 362 Memorial Dr., Cambridge, Mass. 02139 if you plan to attend.

MICHIGAN - DETROIT

The Exchange Clubs of Michigan and a host of other agencies are sponsoring their annual indoor contest in Detroit on April 19, from 9 AM to 5 PM in the Michigan State Fair Coliseum. The events are HLG, Paper Stick, Mike Stick, Indoor Scale, Novice HLG (Jetco Dart) and Novice ROG (Jetco kit). The Detroit Balsa Bugs had set up a contest for May 3 in the Coliseum, but it appears that the Coliseum will be closed by the teen dances again. Contact Ed Stoll, 7319 Marjorie, Detroit 13, Michigan for final info.

NEBRASKA - LINCOLN

Contestants who flew in the Sky Knights' 2nd Annual Indoor Contest had high praise for CD Walt Erbach's work and planning. Top times were: HLG - 0:39.9, Tem Johnson; Paper Stick - 8:01.6, Tem Johnson; Mike Stick - 9:38.6, Walter Erbach.

NEW JERSEY - LAKEHURST

News has filtered down from several sources about a two day indoor meet at Lakehurst May 16-17. This seems to be a solid date, but check with C. V. Russo, 143 Willow Way, Clark, New Jersey for more details.

NEW ZEALAND - AUCKLAND

The N. Z. fellows are making full use of their sites and getting some pretty good times. At Mangere they have a 22' Cat. I site where Trevor Martin's MicroDyne Super "C" has done 11:10 and Jack Eriksen did 9:11 with a solid stick paper covered model. During a recent session in the 45' hall at Hamilton, Trevor boosted the Cat. II 18" Stick record up to 9:46, only to have Jack boost it up to 12:24.6 later in the day. Jack also flew his newest and best (a 30" mike ship) to 18:47.2 at that same session.

OHIO - PARMA

Members of the Lake Erie Gas Model Club have been jazzing up some of their club meetings with impromptu indoor contests. The meeting room is a church basement with a 9' ceiling and they fly Class A models. The club record is 3½ minutes - pretty good for such a low ceiling.

TEXAS - DALLAS-FT. WORTH

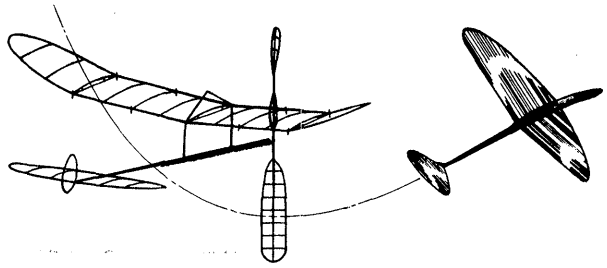
Since the Nats are coming to Dallas, an effort is being made to provide flying sites for local fliers to trim their Nats models. A record trials has been set up for April 18 in S.M.U. Coliseum (Cat. II - 56') as the first session. If the attendance is good enough, at least two more sessions will be set up. Contact Bud Tenny, Box 545, Richardson, Texas 75081 for more info.

WASHINGTON, D. C.

The D. C. Maxecutors are another club that liven up their club meetings with short indoor sessions. They also have a 9' ceiling; club record is 4:25 with an Easy B type model. Specs on the model are: 18" max span, 3.5" max chord, 1 gram min. wt., 45 degree wing-spar-to-wing-post braces permitted, solid stick and boom, all balsa prop, condenser paper covering.

The Voice of N.I.M.A.S. MAY·1964

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

KEITH ALBERTS, N. 4404 McDonald Rd., Spokane, Wash.99216
MARTIN SCHINDLER, 304 Roosevelt Ct.NE, Vienna, Va.22180
DAVID SPRITKE, 703 Linden, Apt. C, Waukegan, Illinois

Honorary Members

TREVOR MARTIN, 8 Cromwell St., Mt. Eden, Auckland, New Zealand
YOSHIO YAMAZAKI, No. 60, Nishiogikubu-2-Chome, Suginami-Ku, Tokyo, Japan

Perhaps it would be in order to explain that fliers from foreign countries who subscribe to INDOOR NEWS AND VIEWS are granted honorary memberships to NIMAS. Since they don't come under AMA jurisdiction, they have no say about our flying rules, but their ideas and suggestions are welcomed and encouraged. Also, if foreign groups should decide to form a NIMAS of their own, we stand by, ready to help as needed.

1964 Nats!

Last weekend we conferred with Bob Lutker, Contest Manager for the '64 Nats, about arrangements and plans for the indoor event. One item which received quite a lot of attention was spectator control. As we all know, when the floor area is limited as it will be this year, any person or persons in the flight area when they are not launching or retrieving a model just cause extra air turbulence. For this reason, we hope to limit access to the flight area to those persons who are entered in the contest, plus one helper for each contestant in rubber.

Postal Contests?

We are privileged to read many club newsletters; one of the most interesting topics which come up is that of postal contests. This magnificent idea, dreamed up I know not where, is based on the fact that flying models is fun; and that inter-group competition is even more fun than that. Some group of fliers will challenge another group (the challenged group may be in the next state or half-way around the world) or several groups to a contest between teams flying specified types of models during a certain period of time. After each group has met at its own site and the teams have made their flights. the results and a lot of good will are exchanged by mail.

Last week, it occurred to me that the indoor fraternity could use this idea to good advantage. The outdoor postal contests almost always involve Nordic A-2, Wakefield and FAI Power, since these events are universally defined. Indoor fliers might not find it advantageous to use FAI Indoor because of site limitations, but how about Easy B and HLG? For that matter, any groups who like the idea could arrive at the model class - the idea is to do it! If you are interested, drop me a card and let's see who all are willing to try. Suggest the model class you want and some details about your site - I'll try to set you up with addresses of groups to challenge. For that matter, we have several "lone wolf" types who have access to a site - if they can scare up a helper and a timer, maybe we can scare up someone else to go at it with them.

Xerox, Anyone?

Does anyone have access to a Xerox 914 Copier or some equivalent copier? From time to time a need arises for copies of out-of-print material; perhaps it would be possible for someone in the right position to furnish these at cost. Any Volunteers?

Back Issues?

The last few weeks have brought quite a few requests for back issues - enough to do in all issues prior to December 1962, and to clear out all back copies of "The Hand Launch Glider" by Richard Miller. There are still a few Dec. '62 issues, and a quite a few complete sets for 1963 and all 1964 issues to date. The price to NIMAS members is 35¢ (stamps preferred) - just ask! The price to non-members is 10¢ per copy.

FAI INDOOR REPORT

Bruce Paton Appointed

AMA President Maynard Hill has appointed Bruce Paton to succeed Dick Kowalski as Chairman of the FAI Indoor Committee. Bruce has demonstrated great interest in FAI Indoor and made significant contributions to the program in 1963. Our best wishes to Bruce; this is a demanding and largely thankless job.

INDOOR RULES

Committee Report

The May issue of Model Aviation contains an up-to-date report of the activities of the Indoor Rules Committee along with a complete history of how the group came to be established.

Rules Questionaire

On page 10 of the May issue of Model Aviation you will find the Indoor Rules Questionaire as prepared by the Indoor Rules Committee after considerable study. It behooves all indoor fliers who are interested in the future of our grand sport to fill out one of these questionaires and return it to Bud Tenny, Box 545, Richardson, Texas 75081. Please note that the questionaire has been streamlined so that almost the whole thing can be filled out by using check marks. The act of filling it out will take less than 10 minutes (aside from the time it takes to make up your mind). If you have the additional time it takes to make suggestions, please do this - we need your ideas! If you don't have time for extra comments, please find time for the basic questionaire - it is very important!

RECORDS? MAYBE!

ALL-SCHOLASTIC AIRCRAFT SHOW, April 5, 1964 (33' ceiling)
Cat. I, St. Edward High School Gym, Lakewood, Ohio
Open B Cabin ROW - 4:51.0, Ron Ganser
Open Ornithopter - 3:07.0, Ron Ganser
Open Autogyro - 2:55.8, Ron Ganser

EDWARDS AFB RECORD TRIALS, April 19, 1964 (93' ceiling)
Cat. II, Weight & Balances Hangar, Edwards AFB, Calif.
Open B Cabin ROW - 9:15.8, Warren Williams
Open HLG - 1:22.5, Lee Hines

D. C. MAXECUTORS INDOOR CONTEST, April 26, 1964 (22')
Cat. I, Robert E. Perry High School, Rockville, Md.
Jr. Class D Stick - 3:05, Alan Huntley
Open C Cabin ROW - 2:52, Bill Bigge

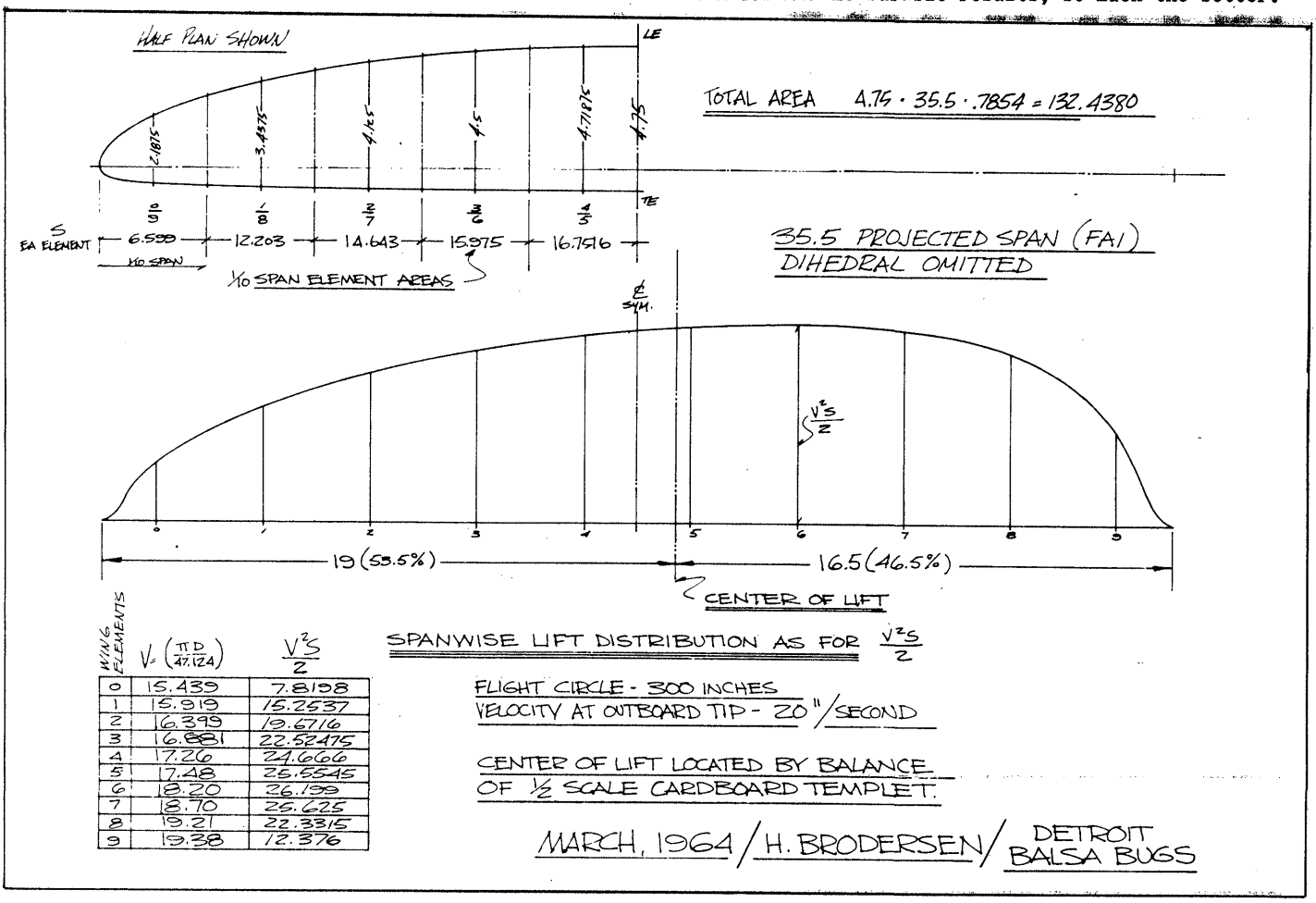
GOOFED AGAIN!!

Last month we showed an adjustable run-down stand to be made from a collapsible antenna; in error we credited Clarence Mather for the idea and it should have been Pat Green, also of the Detroit area. Sorry, boys!

DESIGN FOOTNOTES

Quite often there is need for a more than superficial treatment of specific topics or items of design procedure. In effect, one might be answering the question "Why did you do <u>that</u>?" with regard to some single design or construction feature on a model.

In this column, then, we have the place for anyone to explain the unusual features of his model. The treatment can range from empirical to theoretical; the main thing is to explain the "how" and "why" of each idea. If you can furnish measurable results, so much the better.



WING ELEMENTS	$V = \left(\frac{\pi D}{47.124}\right)$	$\frac{V^2 S}{2}$
0	15.439	7.8198
1	15.919	15.2537
2	16.399	19.6716
3	16.881	22.52475
4	17.26	24.666
5	17.48	25.5545
6	18.20	26.199
7	18.70	26.625
8	19.21	22.3315
9	19.38	12.376

SPANWISE LIFT DISTRIBUTION AS FOR $\frac{V^2 S}{2}$

FLIGHT CIRCLE - 300 INCHES
VELOCITY AT OUTBOARD TIP - 20 "/SECOND

CENTER OF LIFT LOCATED BY BALANCE OF ½ SCALE CARDBOARD TEMPLET.

MARCH, 1964 / H. BRODERSEN / DETROIT BALSA BUGS

The Case For Wing Offset

Hardy Brodersen

Let's study a model in circular flight - one with these constants:

Span (FAI size)	35.5 inches, projected
Flight circle	300 inches dia. (25')
Velocity at outboard tip	20 inches/second

The classic formula for lift:

$$L = \frac{p\, V^2\, S\, C_L}{2}$$

where: p = mass density of air
S = surface area
C_L = coefficient of lift
V = velocity

We can consider that p and C_L are constant for the span, in fact, our ability to measure the latter is a fit subject for alchemy! Thus, the formula boils down to:

$$L = \frac{V^2\, S}{2}$$

The planform of the wing (the sweepback has nothing to do with this study) is an ellipse. A half span is shown, divided into tenth span elements with a number assigned to the centerline of each element (0 - 9). The area for each element was computed and the total checked with the area calculated as maximum chord x span x .7854.

The velocity for the centerline of each wing element was calculated according to the flight circle circumference at each element over the elapsed time of one circle at 20 inches/second at the outboard tip. The formula is:

$$V = \frac{\pi D}{47.124}$$

By using the velocity at each element and the area (S) at each element it is possible to complete the formula for each station and to obtain a factor which will be in proportion to the lift applied at each wing element centerline.

These factors were plotted in an arbitrary vertical scale and connected with a curve. The tip losses were interpolated freehand as Munk's text would have us do, thus completing a graphic presentation of the spanwise lift distribution. This graph was made into a cardboard template, cut out, and balanced at the line shown. This indicates, in a manner as scientific as Newton's apples, the right place to have our CG, and the right place to locate the lateral aerodynamic center and the line of thrust.

What I believe this nonsense does for us is to allow a net increase in efficiency of the total wing in flight, by operating at a higher net L/D. We accomplish this by having the right offset to account for inboard and outboard velocity differentials. There is no inboard panel washin required to overcome these velocity differentials; in fact, the use of washin on the inboard panel can only be harmful. It will result in those sections flying at lower speeds and higher angles of attack - a lower net L/D. Further, when the whole airplane approaches stall these inboard elements, probably flying near stall anyway, are soon out of business.

To add an editorial footnote to the above, we can say that Hardy has proved his point with the paper model which won the April 19 meet at Detroit (see "NEWS"). His model had wing panels 17.15" long and 14.85" long (53.5% of the span inboard) and it met all expectations. The latest paper ship off your editor's board has 55% inboard, and it also is thoroughly successful without washin. Charlie Sotich is also flying a FAI with similar amounts of offset with good results.

NEWS FROM AROUND THE WORLD

CALIFORNIA - LANCASTER

The Edwards AFB record trials was blessed with high winds - inside and out! Warren Williams' cabin flight drifted diagonally across the 300' x 400' floor in less than 10 minutes - 9:15.8 to be exact. No word has been ceived about other planned record trials yet, but the xt one was planned (subject to USAF approval) for May 24, 1964. Contact Jim Kelly, 44246 North Cedar, Lancaster, California, for final word.

CALIFORNIA - SANTA ANA

As we go go press the Sky Hoppers' May session is under way. Let's hope the hangar door has been fixed, or that the wind outside is calm so the rubber fliers can break their current inforced inactivity. Record trials have been scheduled for June 7, July 12, August 9, September 6, November 8, and December 6. One remaining date, October 11, is set up as an open indoor contest.

CONNECTICUT - RIDGEFIELD

Bob Gilchrist is another reasonably lucky one. He is a mathematics teacher, and has access to the school gym. Better yet, he isn't keeping it all to himself - some of his students are learning on Easy B models. Good work!

ILLINOIS - CHICAGO

Something new in Chicago! Since the Chicago Aeronuts club was reluctant to sponsor another indoor contest this late in the season, individual indoor fliers all over the area chipped in and sponsored one on May 2. Twenty-eight people made donations toward the trophies, and twenty contestants made 71 entries in six events. To justify the mathematics, this included re-entry figures. Top times: Jr. HLG - 0:30.8, George Bucic, Jr.; Jr. Pre-Fab - 0:31.4, Teddy Mills; Jr. Easy B - 8:49.2, Jim Thornberry, Jr.; Open HLG - 1:02.8, Bob Larsh; Open Easy B - 11:04.3, Open Microfilm Stick - 19:51.0, Art Christensen.

ILLINOIS - WAUKEGAN

David Spritke reports that a small group in Waukegan have obtained weekly use of the high school gym, which has ceiling between 25' and 30'. As they build up their activity they hope to obtain use of the Great Lakes Naval Training Center drill hall - 60' to 70' ceiling.

INDIANA - KOKOMO

The April 19 Bunker Hill AFB contest was the last one until winter rolls around again. Although the drift was high, those who attended had an enjoyable time. Winning times: Easy B - 7:38.6, Chuck Borneman; Jr. HLG - 0:34.1, Dick Robison; Open HLG - 0:42.1, Bob Larsh, Team HLG - 1:19.4. This Team HLG is a fine idea - each team consists of one Open flier and one Junior flier, and the top score of each contestant is added to get the team score.

MASSACHUSETTS - M.I.T.

The final MIT Armory session for this year is set up for May 16, from 4:30 PM to 8:30 PM. The Armory is at the corner of Massachusetts Ave. and Vassar St. Recent sessions have been pulling people in from quite a few places, and the sessions have been a boon to fliers in the area.

MICHIGAN - DETROIT

The Michigan State contest on April 19 had a good turn-out of Juniors, which was one of the objectives of the meet. We have only partial results: Open Stick - 22 minutes plus, Joe Hindes; Open Paper Stick - 17:30+, Hardy Brodersen. After some anxiety and short notice on final permission to hold the May 2-3 Balsa Bugs contest and record trials, the conditions were pretty good even if the attendance was low. No records were set on Saturday, but it quite likely everyone enjoyed the social session that evening. Sunday's contest results were low, (everyone stayed up too late Saturday?) but Arthur Markiewicz managed to sweep the Junior events. First place winners: Jr. Paper Stick - 9:45.8, A. Markiewicz; Jr. Microfilm Stick - (two flight total as in FAI scoring was used in mike events) - 23:13, A. Markiewicz; Jr. HLG - 0:34.8, A. Markiewicz; Open Paper Stick - 15:52, Phil Klintworth; Open Microfilm Stick - 45:44, Ed Stoll; Open HLG - 0:59.0, Jim Baggi.

NEW JERSEY - LAKEHURST

Last month we announced a probable two-day Lakehurst ;t; since then we have received confirmation of a meet to be held on May 16-17. This is the only time until after the Nats that the hangar will be open; and this would not have been possible except for the hard work of Lt. Thibodeau. The reason behind the difficulty is the greatly increased use of Lakehurst by both the Army and the Navy.

In view of the above, C. V. Russo has asked that all fliers make a special effort to attend, thus showing the Navy that the use of the hangar is desired and appreciated. Everyone who plans to attend should also write "Russ" and confirm your intent to attend. Write C. V. Russo, 143 Willow Way, Clark, New Jersey.

OHIO - CLEVELAND

The Fifth All-Scholastic Aircraft Show at St. Edwards High School in Lakewood, Ohio, had an excellent turn-out and a good show by Ron Ganser. Ron came over from Pittsburgh to set record marks in ornithopter, autogyro, and B Cabin ROW. The best show was a perfect take-off from a 3' long plastic tank by his cabin model - the model seemed to hit everything and then landed after exceeding the Cat. II mark (there was no Cat. I B Cabin Row Mark). Larry Loucka make a Sr. Autogyro attempt of 1:35, but the Cat. I mark had been boosted to 2:21 by Edmund Smith only two weeks before. Other top times in indoor rubber were: Ninth Graders - 5:06.4, Louis Casaregola; Tenth Gragers - 4:04, Herb Schubert, Jr.; Eleventh Graders - 3:57, Bernie Wisniewski; Twelvth Graders - 6:32, Neil Shipley; Open - 8:17, Joe Novotny.

TEXAS - DALLAS-FT. WORTH

The SMU record trials on April 19 had a pretty good turn-out, but the air in the Coliseum was a little disappointing. One flier remarked that the models seemed to DT during the cruise! Top time was 13:28 with a B Stick, but two paper ships topped 11 minutes. The two Juniors who flew made a good showing - Eric Vogel's B Paper hit 10:35 and Steve Valerius got 9:29 with his paper covered Easy B. Steve's dad (Mark) had mixed feelings about the flight - his own Easy B would only do 9:24!

WASHINGTON D. C.

The D.C. Maxecutors held an indoor contest at Robert E. Perry High School in Rockville, Md., on April 26. The ceiling is 22', and top times were: HLG - 0:19.0, Dan Belieff, Easy B (3½" max. chord, the rest similar to regular Easy B rules) - 7:19.2, Tom Vallee; B Stick - 8:18, Tom Vallee. Dan Champine (Bob Champine's oldest son) won third in B Stick with 6:16.5 and won the Junior high point plaque. Only four of the sixteen contestants had flown any indoor before the club was formed last fall! The group has the use of a 40' hangar once each month for serious sessions. So far they have the following club marks for the hangar: Microfilm - 9:52, Paper - 7:19, and HLG - 0:30; they expect these marks to jump at the next session. Contact Tom Vallee, 5600 54th Ave. #204, Riverdale, Md. for info about this group.

WASHINGTON - SPOKANE

Another new group, spark-plugged by Keith Alberts, is attempting to revive model airplane activity in Spokane. At present, their indoor activity is centered in a 40' gym, but they are looking forward to next fall when they may be able to get a 60' site.

A LOOK AT YESTERYEAR

Last month we reported that an early issue of M.A.N. credited Bob Clary with discovering microfilm. Irving Sherman, formerly a member of the Junior Aero League in Boston, visited with your editor briefly a while back, and offered this story: Members of the JAL had dreamed up the idea of a microfilm type of covering and spent many hours trying to perfect it. Their initial efforts included spreading the solution on glass and trying to peel it off for use. One evening a bottle of experimental solution was spilled onto some water accidentally - and the problem was solved! With regard to the M.A.N. story, Irving says, "Bill Tyler, in 'The Indoor Model' in Bill Winter's MODEL AIRCRAFT PLANBOOK, credits both J. P. Glass and R. Cleary (maybe Clary was a misprint?) with the discovery of microfilm. Torrey Capo told me that story about the accidental discovery of water surface to spread film. If it is so, then I think that Tyler is correct in crediting both. The reference in M.A.N. is incorrect - I well remember reading it."

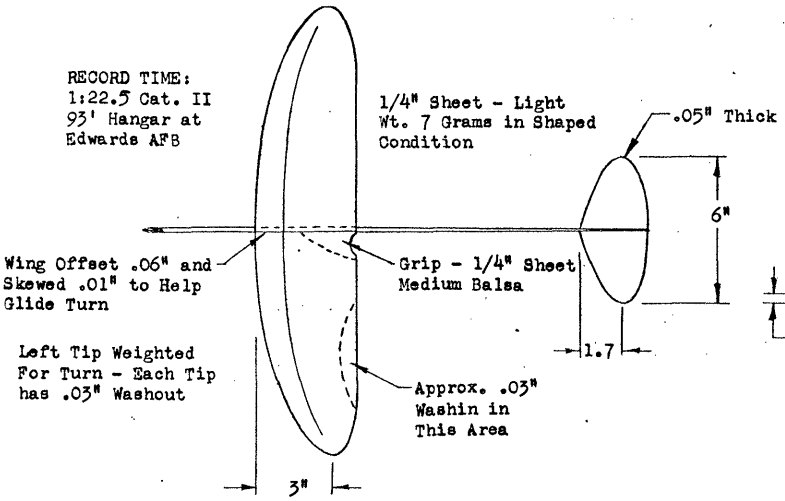
Irving also related how he heard a report by Hewitt Phillips and Bruno Marchi which indicated that most models then were turning out to have minimum sink with the CG at about 50%. (In those days the wings were mounted with aluminum clips which permitted the wing to move back and forth for trim - changing wing location instead of incidence.) Irving then made a suggestion, which he tells about: "My suggestion was that perhaps by using balsa tubes to plug-in wing mounts, sacrificing easy CG positioning for easy incidence change, we could rid ourselves of the clip nuisance. Gordon Cain said he thought paper tubes would be easier and neater. At the following meet Phillips had balsa tubes and Gordon had paper - both OK. Gordon found that if the mounts became loose, moistening the ends would swell them for a tight fit. All now turned to sockets and clips were "dead". This was Oct. '39."

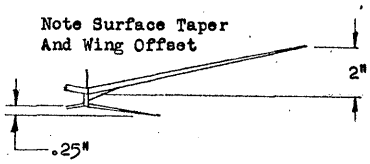
STATE OF THE ART

Our full-page presentation has been planned for some time - Lee Hines' Nats winning HLG, Sweepette 18 Mk. IV. Then, three weeks ago, Lee built Sweepette 18 Mk. IX for Cat. II. He finished it at the Weights & Balances Hangar at Edwards AFB - and set a brand new record the same day. His design goals for the glider were 1/2 oz. finished weight and 80' climb altitude. It finished out (with one coat of sealer) at 14.6 grams (.51 oz.) and climbed to about 85' maximum. The air was quite turbulent all day, with some of the turbulence helping and some hindering. Lee tells the story: "After lunch I tested and was throwing hard about 4:45, removing noseweight every flight. I finally got up to 1:05 about 5:15. Then the air seemed to even out or change for the better somehow, and I began to get better times over a certain floor area. Then about 5:45 I started getting steady flights as follows: 1:12, 1:14.5, 1:14.8, 1:16, 1:22.5, 1:14.5, 1:13, 1:05, 1:09.5 and so on for about ten more flights until my foot cramped.

As I was constantly trimming, I would assume approximately 10 to 12 seconds of the 1:22.5 flight were due lifting air. This is quite interesting, as Carl Redlin has told me of Otto Heithecker's record flight of 1:15, where he felt 10 seconds were due to good air, since Otto's usual time was 1:05 in there."

What more can we say? In order to complete the picture and bring it up to date, the major dimensions and features of Sweepette Mk. IX are presented below.



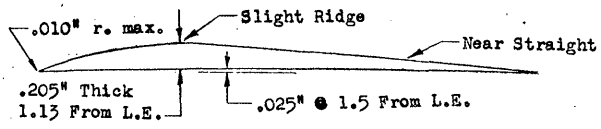


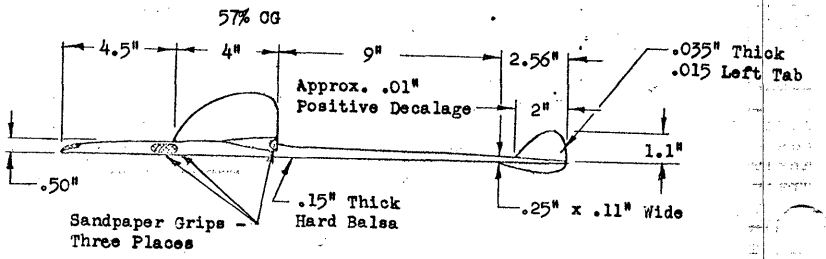
SWEEPETTE 18 - Mk. 9

Lee Hines 22 Apr. 64

DESIGN DATA

1. Flat Span - 18"
2. Length - 20.06"
3. Wing Area - 57 sq.in.
4. Stab Area - 11 sq.in.
5. Weight - 14.6 Grams
6. One Coat Sealer
7. Flight Pattern - Right Climb, Left Glide





HINTS AND KINKS

A New Stripper

In his quest to improve his models for the upcoming World Championships, Bill Atwood developed a vastly improved stripper. It gives strips, tapered or with parallel edges, accurate to .001". With this accuracy it is possible duplicate or match spars very closely.

This performance is made possible by separating the blade from the straight edge and positioning the straight edge with micrometer dials which have 1" travel. It is used this way: (Refer to Fig. 1 below) Balsa planks are placed under the ends of the dials against the supports ("A") and the straight edge is placed on top of the plank and against the ends of the micrometer dials. The cutter (Fig. 2) is placed against the edge of the straight edge with the dowel pin supporting the back of the cutter and holding it perpendicular to the wood. A preliminary cut is made which "trues up" the edge of the plank. Now the dials are backed off the width of the spar - note that each dial is independent, so any degree of taper can be set in - and a second cut is made. Repeat as many times as necessary to make the spars you need.

The base of the stripper can be anything that will hold the dial supports - Bill used masonite. The dial supports are made from 3/8" aluminum tapped 40 threads per inch to take the dials. The straight edge is 1/4" steel 1" wide with the edges ground flat and parallel.

Prop Marking

Ray Harlan makes this suggestion for marking props so you can keep track of them: "I splurged and bought a four-band, numbered rubber stamp with which I can set four numbers - two for diameter and two for pitch. It looks like a date (for example 1428), but it serves the purpose and it is easy to read. Since monospar props have at least 1/16" diameter hubs, 1/8" letters can be rolled onto them and can be read easily at a glance. Rubber stamps also have symbols such as # and flat spaces so the props can be numbered and coded other than just pitch and diameter.

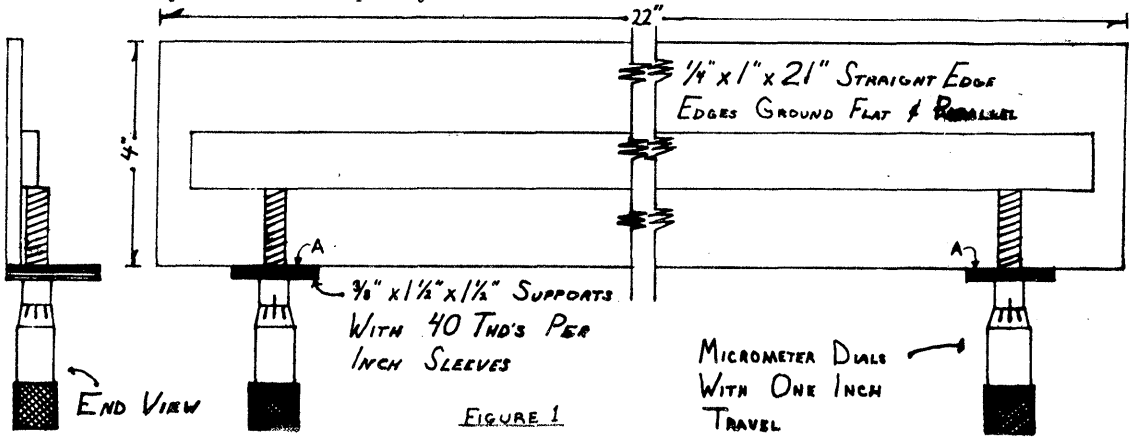


FIGURE 1

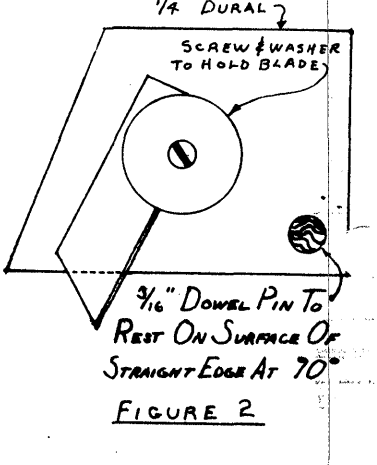
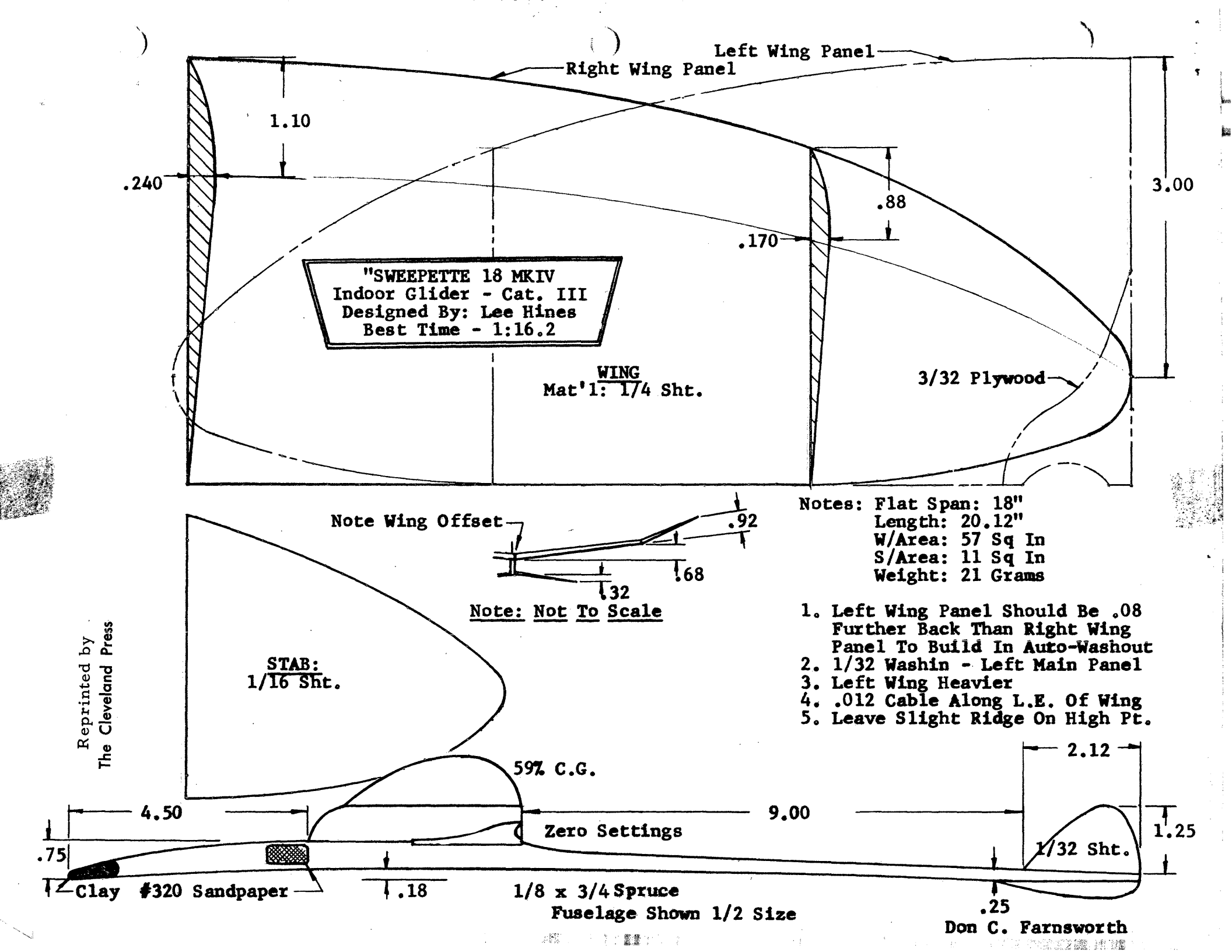
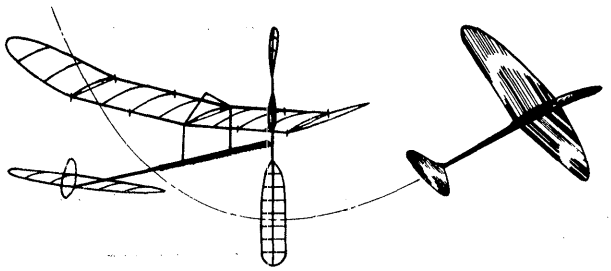


FIGURE 2



The Voice of N.I.M.A.S. JUN·1964

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

BILL TYLER, 175 West 72nd St., New York 23, New York

1964 Nats!

If you haven't already sent in your Nats entry blank, you have less than two weeks to do it - the deadline is midnight, June 24, 1964!

Plans are continuing toward good spectator control during the Indoor Nats - late word from AMA HQ is that indoor contestants will have nametags with distinctive colored inserts. You must have one of these badges to be admitted to the flying area - spectators are welcome, but they must remain in the bleacher area. This is quite necessary to prevent a crowded floor and the resulting highly turbulent air which kills time and spoils flights.

Irving Sherman recently made the trip from Dallas to Cambridge, Mass., and recommends that anyone planning to drive to the Nats from the Northeast should plan to go through St. Louis and Oklahoma City - it has interstate highways all the way.

NIMAS Meeting?

At the '62 Nats in Chicago we had a meeting of all the NIMAS members we could round up - a general meeting which enabled us to get better acquainted. We also had an enlightening discussion about several NIMAS projects; as a group we suggested that the former Stout Commercial Trophy be rejuvenated and set up as a perpetual trophy for Indoor Stick.

In 1963, the available meeting time was taken up with many important AMA meetings; we just couldn't squeeze one more meeting into the schedule.

If at all possible, a NIMAS meeting will be held this year, possibly after the close of indoor flying. Watch this space next month for further announcements.

Postal Contests!

Right after the suggestion about postal contests in the May issue, Bill Graham of Winnipeg challenged Bud Tenny; his 55' hangar against the 56' SMU Coliseum when it became available. We're discussing events and rules; the events will be Easy B, B Stick, Indoor Stick and maybe HLG.

Lee Hines and Ken Happersett will have a go with any other two IHLG fliers in any ceiling Category; if more than two fliers wish to accept the challenge, Lee thinks he can find a few more members for his team.

Dick Black, one of the sparkplugs of the Ann Arbor Airfoilers (Michigan), feels that their group can field a team of between four and six fliers for a postal meet; their proposed events would be HLG, B Paper, paper covered Easy B and perhaps microfilm Easy B. Their site is a 20' school gym - a typical site and one which ought to be equal to many others around the country. Who else will step forward? This sounds like a lot of fun - send a card listing details of your site and the events you wish to fly to Bud Tenny, Box 545, Richardson, Texas.

MODEL AIRCRAFT & CIRCULAR AIRFLOW

That's the title of the latest model aircraft book by Frank Zaic - and anyone who has read any of his fine Year Books won't have to be sold on this book. Send a check for $3 to: Frank Zaic, Box 135, Northridge, Cal.

TWO GOOFS!

With a bold stroke of the pen (well, anyway, several strokes on the typewriter) I managed to create a new AMA event! When the final version of the Indoor Rules Questionaire came out, I had listed C Cabin ROW as an event. It really isn't, and no one who reviewed the questionaire before publication caught it. Several people called me on it when they sent in their questionaire - but it was too late. About the same time, I listed a C Cabin ROW record attempt in RECORDS? MAYBE! If anyone is confused as a result of my goof, I'm sorry.

INDOOR RULES

Rules Questionaire

Returns from the Questionaire have been fairly slow, but the surprising thing was who took time to send them in. For a long time, all the returns were from fliers who were not members of NIMAS. By now, however, more NIMAS members have responded and the ratio is just over two to one in favor of NIMAS members. Another surprise: there are two or three groups who feel quite strongly about possible rules changes, both pro and con; almost none of these fliers have expressed themselves. Once again I stress the importance of the questionaire; future action by the Indoor Rules Committee should be based on information gleaned from this source. Thus, all who are interested in this issue should complete the questionaire and return it to BUD TENNY, Box 545, Richardson, Texas.

FAI INDOOR REPORT

65 Cm. Span FAI?

The Sept. '63 issue of INDOOR NEWS requested that all fliers forward their opinions on changing the size of FAI Indoor models from 90 cm. maximum span to 65 cm. span in preparation for an expected discussion of the issue at the fall meeting of the C.I.A.M. Before the meeting it was agreed to wait until the 1964 meeting before bringing the issue up; that time is about here. Bob Champine has been tentatively appointed to attend the meeting this coming November; he would like a consensus of opinions from U. S. indoor fliers on the subject. Send these comments to: Bob Champine, 25 Beechwood Dr., Yorktown, Virginia, or to: Bud Tenny, Box 545, Richardson, Texas.

INDOOR ELSEWHERE

A few years ago, indoor flying almost died out everywhere. In the U. S., indoor boomed when we created ceiling categories. About a year ago, the boom leveled out for a while - took a breather. The indications now are that indoor is growing again, steadily but slowly.

Along with our growth, indoor is being revived all over the world. It didn't die out in England, and there are signs that indoor is slowly growing there. In New Zealand indoor started growing again a couple of years ago; it is still growing and the fliers are becoming very competent. South Africa has a small group of indoor men; their times are quite good considering the lack of materials to work with. Finland has a small group of dedicated fliers and there are quite a few newcomers also. In Holland, we have one or two fliers who are handicapped by lack of places to fly. Although Boyd Felstead lives on the island of Tasmania and maintains a good correspondence, I've not heard of any activity in the rest of Australia.

This month, we will learn something of the rules and performances of our friends to the north - Canada. As time and space permit (and material becomes available), we can find out about indoor activity in other lands.

Canadian rules have recently been worked over, with emphasis on revising the list of events. The flight regulations, which were patterned after U. S. rules, were not changed. Ceiling categories have been adopted, with the break between Cat. I and Cat. II being at 25 feet.

Model classes were adopted as follows:

Hand-Launched Stick Model - Class A (30 sq.in. max.)
Hand-Launched Stick Model - Class B (30 to 100 sq.in.)
Paper Covered Stick Model - Class B (Same as Class B)
Helicopter - Optional launching; no size classes
Hand-Launched Stick Model - FAI Class

The Canadian HLG is quite similar to the U. S. model except they have provided for a minimum weight of .1 oz which should prevent any nonsense about microfilm gliders! They also retained U. S. scoring of the best single time from nine attempts. The Open HLG record (before adoption of ceiling categories) was 0:47, held by Bill Graham of Winnipeg.

The present list of Canadian records I have was compiled before the ceiling categories were established; some recent marks were: Class A Microfilm (formerly like U. S. Class B) - 8:38.5, Gord Hilliam; Class B Microfilm (formerly 100 to 300 sq.in.) - 12:25.2, Duncan McRae; FAI - 21:39.1, Duncan McRae.

The Canadians also have a category for records set on foreign soil. One of these is Open HLG - 0:57.1, Ron Higgs. Ron made this flight in Chicago at the '62 Nats.

HINTS AND KINKS

Safe Winding

No matter how careful we are, or how prepared we are, sooner or later we break a motor trying to get maximum turns in it. Nearly always it is possible to protect the model, but once in a while a broken motor gets away from us and damages the model. The winding systems presented here won't always save a model (Bill Graham was unlucky enough to have a motor break in flight after eleven minutes), but it will eliminate most of the danger.

Method One

by John Triolo

After having several props ruined, microfilm shattered, etc., (by broken motors), I decidedto wind off the model. The advantages are:

1. Safety for the model.
2. Peace of mind when packing in maximum winds. This enables you to concentrate on your technique of winding, especially when you are using an old motor which you want to "push" - or a new motor.
3. Any chance of bending the prop shaft is gone.
4. An experienced helper is not needed since you do your own winding and transfer the rubber to the model yourself.
5. By using a counter you get the turns you want without "chickening" out.

The procedure is this: Have your helper hold the model high in his left hand while holding the rubber attached to a small block of wood by a hook. Hook your winder to the motor and pack in the number of turns you want. Remove the motor from the winder and hold it in your left hand. Grasp the model by the prop and thrust bearing, letting the motor stick rest on your index finger. (Take a good bite on the stick with your fingers to allow for the length of the prop shaft.) Hook the motor to the shaft. If you grasped the model correctly, the thumbnail should be just aft of the shaft hook. Remove the other end of the motor from the block and hook it to the model with your left hand - and you're off!

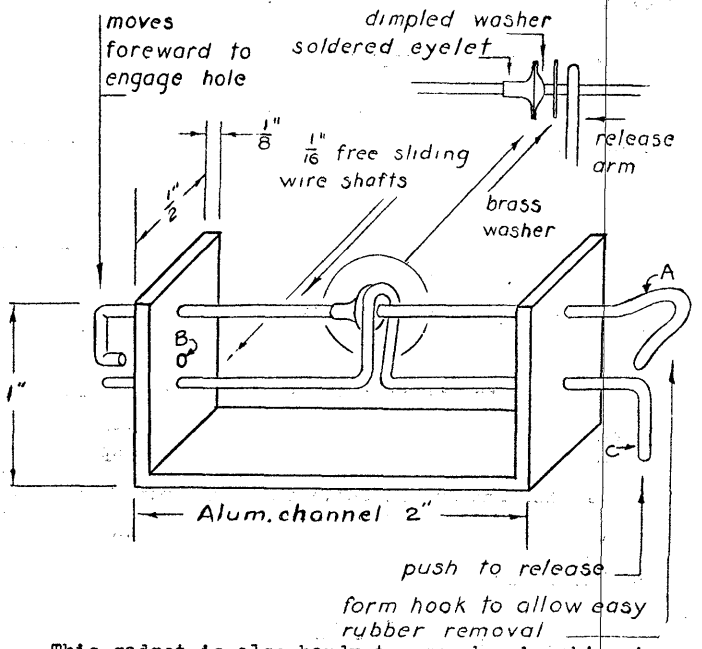
Method Two

by Charlie Sotich

Study the sketch below as an aid in understanding how this gadget works. It is the latest of several devices that permit an indoor modeler to wind his model without assistance. I had to develop it so that I could do my test flying last summer before the Nats when no one else was coming to the Armory. The motor is wound off the model and then put on the model. All this device does is hold the back end of the motor while it is being wound and then releases a few turns so you can slip the motor off the hook and transfer it to the model. The dimensions shown on the sketch are not critical - but are shown to give an idea of the proportions used.

The procedure for using the device is as follows:

1. Hook the motor to hook "A" with the knot centered on the hook. Be sure the other end of "A" engages hole "B".
2. Stretch and wind the motor in the usual manner.
3. Unhook the motor from the winder and hook it to the prop shaft.
4. While holding the prop and plane with the right hand, grip the other end of the motor just in front of the knot with your thumb and middle finger of your left hand.
5. Push the release lever ("C") with the index finger of your left hand to release a few turns.
6. Slip the motor off the hook and put it on the rear hook of the model.



This gadget is also handy to use when breaking in motors as they can be easily unwound. I have noticed that when fellows use this device to wind with they tend to break more motors. They probably are not as afraid to wind to capacity since their models are not in danger.

A LOOK AT YESTERYEAR

Bill Tyler poses this question: "When was the last time an indoor pusher was flown?" His answer: "To the best of my knowledge, the last indoor pusher was flown at Lakehurst by Jimmie Throckmorton of Atlantic City, N. J., before World War II."

STATE OF THE ART

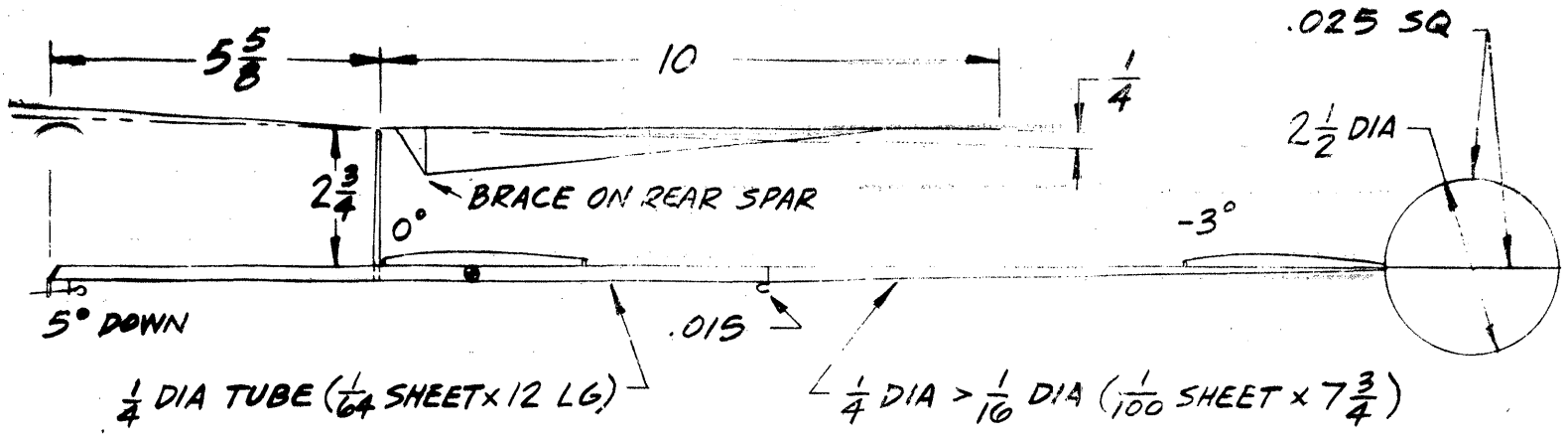
The model design featured this month has set two records for its designer, Ned Smith. It is the seventh in a series of models built in the past few years, and the schedule of weights shown on the plans corresponds to the model which flew for 5:22.9 in Lakehurst. A lighter model (total weight .025 oz.) of the same design flew for 2:21 in the 30' Union High School Auditorium for a new Cat. I Senior record.

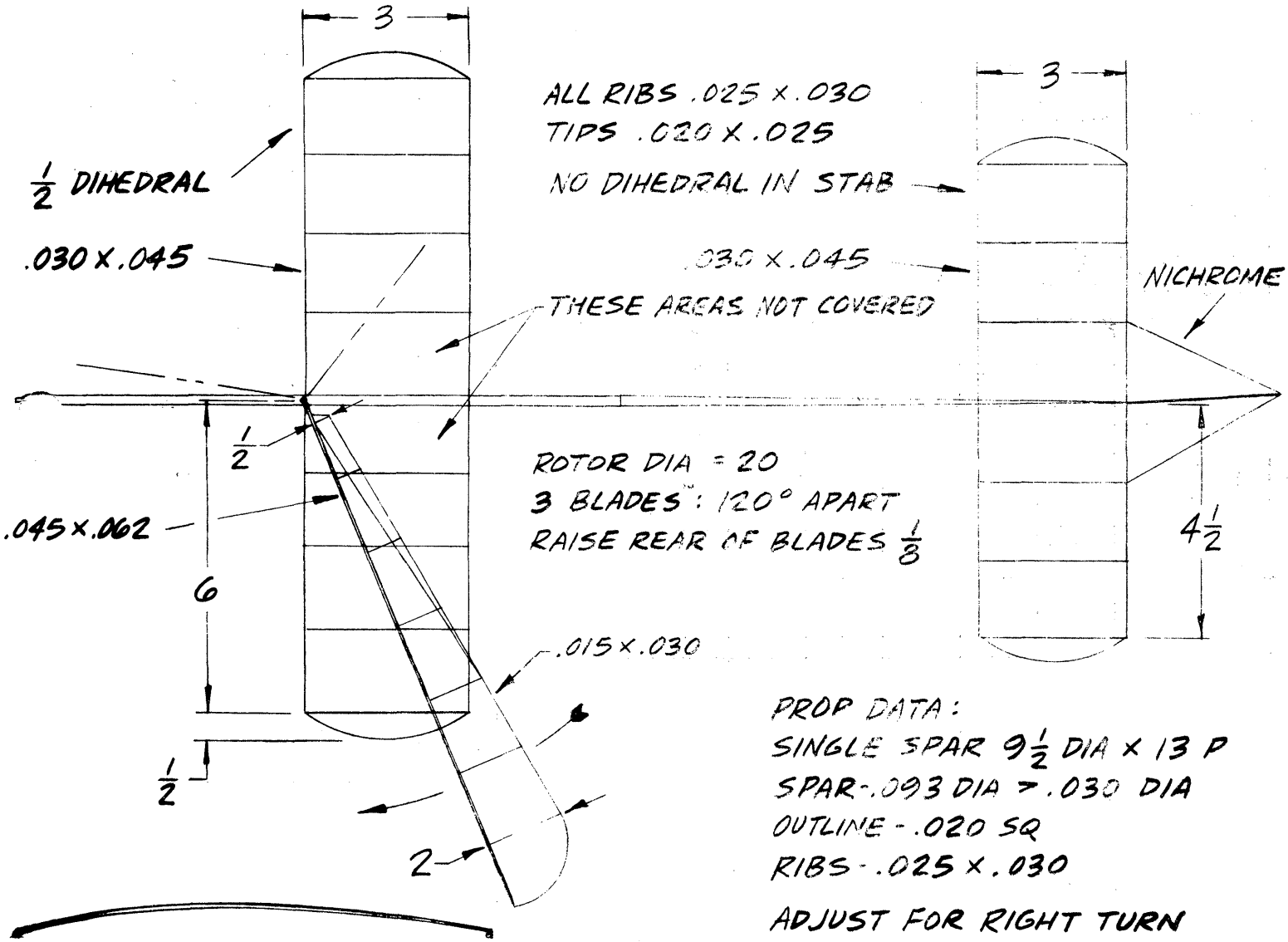
Both models were flown to the right, since there was a definite tendency to spin when flown to the left. The flights in Cat. I also brought out another tendency - it would stall and not recover when it touched the ceiling. Ned feels that this is due to the fact that the rotor is still lifting, which holds the nose up. He suggests that if this is a problem, it may be overcome with downthrust.

On the plans, it appears that the rotor and the prop would clash; but the rotor incidence (the whole rotor) is about ten degrees; the rotor mast also flexes. Thus, the prop and rotor clear while in flight but not at rest. The individual rotor blade trailing edges are raised 1/8" as measured at the widest point on the blade to give the proper incidence for auto-rotation.

LAST MINUTE BULLETIN

The Free Flight Contest Board has received a ballot for final vote on the proposal to add FAI Indoor to the schedule of AMA indoor events. At this point, a favorable vote will create a new event; a negative vote will kill the proposal.

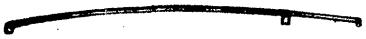




PROP DATA:
SINGLE SPAR 9 1/2 DIA x 13 P
SPAR - .093 DIA > .030 DIA
OUTLINE - .020 SQ
RIBS - .025 x .030

ADJUST FOR RIGHT TURN
FLY AGAINST TORQUE
POWER - .060 PIRELLI
MICRODYNE FILM & WOOD
ROTOR CLEARS PROP DIE TO
ROTOR INCIDENCE & MAST FLEX

WING & STAB



ROTOR

WING	.0031
STAB	.0027
FUSE.	.0150
ROTOR	.0100
PROP	.0035
FIN	.0003
TOTAL WEIGHT	.0346

"LUCKY SEVEN" by EDMUND SMITH
CAT. III SR. RECORD 5:22.9

THE LAB

In the past few months, Fred Pearce of NASA (formerly of the Langley Brain Busters and now in Houston, Texas) has been perfecting a method of testing rubber. While his test is not non-destructive and takes quite a bit of time to perform (the ideal test would be non-destructive and simple enough to perform on the field), it is a valid test and the most definitive test I've seen so far. The following material is reprinted from SCATTER, the fine newsletter published by the SCAT club in California (if you are also interested in FAI Power, Wakefield and A-2, SCATTER is a must):

"I've been making some energy storage tests of rubber, based on the stretch method. I assume that this method is related to the energy storage as when the rubber is wound. My procedure is:

1. Make up 12" loops of new rubber. Weigh the samples making allowance for the knot. Record the exact length.

2. Establish the force to which each sample is to be subjected when stretched as a function of the cross-section density. I use 1785 times the weight in ounces per inch of loop. For a typical sample of 6 mm. Pirelli, this comes out to 20 pounds.

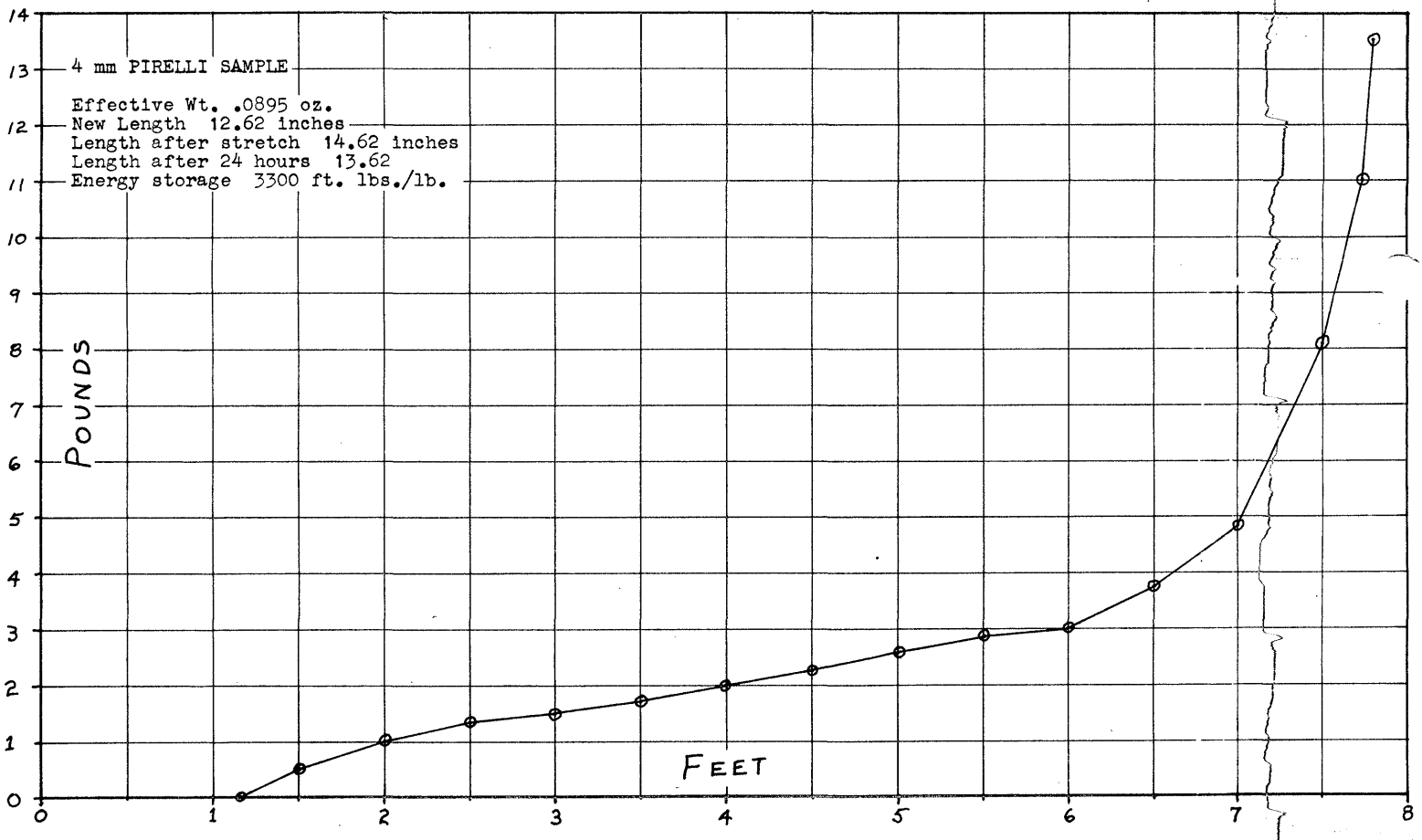
3. The rubber is anchored securely and stretched till it just won't stretch any more (this is typically near 8 feet for a one ft. loop). I maintain the calculated pull force at the maximum stretch for 3 minutes.

4. Then, using a spring scale, I measure the pull force coming in at 6" intervals.

5. A graph is plotted of the pull force as a function distance. The area under the curve is the energy storage. Dividing this energy by the weight of the sample gives the energy storage. I express this in ft. lbs. per lb. (unit is ft.). Typically this is around 3300 ft. lbs. per pound for very good Pirelli.

6. As an additional descriptive term, I measure the area under the lower half of the curve to give some indication of the flatness of the curve. Typically this runs around 800 ft. lbs./lb. for Pirelli."

The graph shown below is information recorded during a test Fred ran on some rubber for me, which gives a very good rating on this particular piece of rubber. To find the area under the curve, divide the curve into straight line segments and multiply the average height of this segment (the unit is pounds) times the width of the segment (the unit is feet); add these figures to get total energy for the test loop. Divide this figure by the weight of the loop in pounds to get ft. lb./lb. To make the calculation simpler, I have plotted Fred's figures and used straight line segments instead of the nice curve he furnished.



NEWS FROM AROUND THE WORLD

CALIFORNIA - UPLAND

Warren Williams reports that he recently demonstrated several different indoor models at the Men's Prison at Chino, California. Model airplanes have been used in the rehabilitation program for some time, but this is the first example of indoor models in the program. It seems likely that indoor could catch on there, and a recently completed recreation center (45' ceiling) will offer a good place for the models to be flown.

CANADA - WINNIPEG

The lament of a lonely flier: Why, oh why aren't there more indoor fliers? Bill Graham actually has more sites to fly in than he has fliers to fly with him! The bonanza of sites totals this way: one 18', two 40', one 55', and one 65'! The last one is a hockey arena and not available most of the year, but the others are available fairly often. Maybe Bill could offer hints on how to persuade people to let us in, and some of us could swap hints on recruiting?

ENGLAND - CARDINGTON

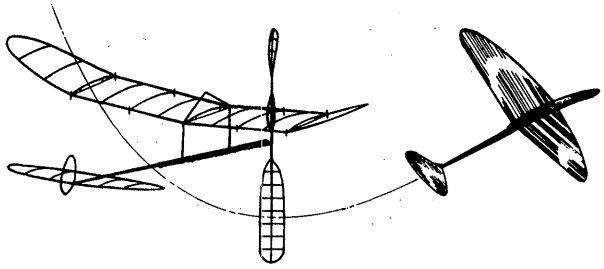
The first English practice session at Cardington had a last minute hitch - payment of $30 was asked when no previous charges had been made. So that session didn't get started, but arrangements apparently have been made to everyone's satisfaction, since the June session is now firmed up. This leaves only three sessions for the team to practice, including the team selection session.

NEW JERSEY - LAKEHURST

The "solid" date for a two-day meet at Lakehurst evaporated at the last minute, leaving a good many people out of a chance to trim for the Nats. Apparently there is a chance for a session later this year - time will tell.

The Voice of N.I.M.A.S. JUL · 1964

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

FRANK L. HAYNES, 2096 Tiebout Ave., New York, N. Y. 10457

'64 Nats

By now, all who entered Indoor at the '64 Nats have received a special notice from AMA HQ. The notice said that indoor contestants would be able to register at Will Rogers Coliseum (the indoor site) in Ft. Worth on Monday, July 20. This is to correct the original instructions which said that all contestants must register at Dallas NAS prior to going to fly indoor. The notice also calls out the flight schedule (Indoor HLG - 9 AM to 2:30 PM, Indoor Rubber - 2:30 PM to 9 PM with the last official flight required to be airborne by 8:35 PM).

This all came about after June 21 - I was filling out my Nats entry blank (late as usual!) and read the registration instructions. Quickly I sent a letter of inquiry about the matter - registration was scheduled to start at 8 AM on July 20, the indoor events were to start at 9 AM, and it is almost an hour's trip from Dallas NAS to the Coliseum unless you are very familiar with the route. I heartily commend AMA HQ for their prompt solution of this problem and the prompt notification of all concerned.

On July 3 I made a trip to Ft. Worth to inspect the Coliseum and to plan the layout and make arrangements for door closing and spectator control. There is one major obstruction in the top - many will remember the big blob of speakers which caught many models during previous Nats. The speakers will be hoisted high and moved to the North end, over the entrance. There are also several big counterweights which hang down about 15' from the top; they won't move but they may not present a major hazard. All the lights are about 85' high, and most of the ceiling should be good to that altitude over the center of the arena.

The major problem, even with spectator control, will be congestion on the floor and in the air. The basic site is excellent, except for the small floor area. If we all will remember that we will have no business on the arena floor (except for along the edge where we will have our equipment) except when we are launching or retreiving a model, extra turbulence will be kept at a minimum. We all can help police the situation by reminding our helpers and acquaintances to step back as soon as we release a model and it goes out of reach. Once a model is away, there is nothing we can do to help it. If you feel that prayer or "body english" is effective, please apply it from the sidelines!

Special Nats Testing Session??

Due to a conflict with outdoor contests and site schedules, Dallas-Ft. Worth fliers have not had a chance to test fly any indoor ships since the April session. An effort has been made to secure the Coliseum at Southern Methodist University for a session on Saturday, April 18. To date, we have only a possibility of an afternoon and perhaps evening session on April 18, due to a University function scheduled for the Coliseum in the morning.

If we are successful in setting up this session, all out-of-town fliers are welcome to attend. In order to find out about the session, call Bud Tenny at AD 5-4035, Area Code 214 or drop me a card telling where you have reservations and I will call you there. Even if we fail, this would be a good chance for a bull session!

There are two conditions about flying: First, since the ceiling is only 56' maximum, attempts at glider trim for Will Rogers Coliseum would be pretty futile. Thus, no gliders allowed, please. Second, this session will represent $25 out-of-pocket, and everyone will be asked to help foot the bill.

The floor area of the arena proper is about 125' x 150', and the usable ceiling is 50'. Since the arena floor has just been refinished, absolutely no street shoes are permitted - go barefoot, wear socks, or bring gym shoes. Bring your models, proper footwear, watches, and your latest theory for bull session material.

S.M.U. Coliseum is located at the east side of the S.M.U. campus, and almost anyone in Dallas can direct you to the campus. Additional directions: Highway 75 (Central Expressway in Dallas) passes just to the east of the campus; if you are going north, take Mockingbird Lane exit west one block from the west service road and turn north - the Coliseum is easily visible. Going south on 75, take University Blvd. exit west about two blocks and turn south, again you should soon see the Coliseum.

NIMAS Meeting?

Nothing more has been settled about having a NIMAS meeting in conjunction with the '64 Nats, but if one is held it most likely will be on Sunday night, July 19. The final decision will most likely be made at the last minute, due to a variety of circumstances. If everyone will give me a call as they arrive in town, it will be possible to notify everyone about the meeting. Call me at: Area Code 214, AD 5-4035 when you arrive or drop me a card telling where you are staying and when you expect to arrive (if you have made reservations in advance) at Box 545, Richardson, Texas. If you have suggestions for a meeting agenda, make a list and let me know.

Postal Contests!

No new challenges have been received, and so far no one has answered the challenges issued last month. If the following rules are acceptable for Easy B, Bud Tenny and Eric Vogel will challenge any other two-man team to a Cat. I postal contest for Easy B. The rules:

1. Fuselage and boom to be solid wood except for wing mount and motor fittings.

2. Wing to be 18" maximum span, 3" maximum chord, paper covered.

3. Prop blades to be all balsa.

4. Surface bracing and curved outlines optional.

We suggest that a third party can be recruited to act as timer and recorder, and that the results be sent sealed in a second envelope which can be opened after we make our flights.

Another challenge! Our daughter Kristi (age 7) has built a Jetco ROG and will challenge anyone her age to a Cat. I match. It is a stock kit except for the wing mount, which has been modified to an all balsa sliding mount to make it easier to adjust and more reliable.

Back Issues?

We have on hand back issues of INDOOR NEWS dating from January 1963 - 18 different issues in all. These are available to NIMAS members for 35¢ handling charge; to subscribers and others the price is 10¢ per copy, stamps preferred for remittance.

More on Dacron

Since the original Dacron "sample" consisted of one pound of Dacron cord (the cord is a bundle of 250 monofilaments), there is plenty left. Anyone who desires to try this material for wing bracing may have a sample by sending a stamped, self-addressed envelope to Bud Tenny, Box 545, Richardson, Texas. My personal reaction to this material for wing bracing is enthusiastic; it is lighter than wire, more than strong enough for even a "D" wing, and easier to handle than wire. The individual filaments are about .0007" in diameter, but it is shiny white and as easy to see as .001 nichrome.

FAI INDOOR REPORT

Champine C.I.A.M. Rep

It has been confirmed that Bob Champine will be the AMA FF representative to the November meeting of the C.I.A.M. Anyone wishing to suggest an item to be placed on the meeting agenda should contact Bob at 25 Beechwood Dr., Yorktown, Va. before August 1. Bob still needs a helping hand on the proposal to change FAI Indoor models to a maximum span of 65 cm. - send him your comments pro or con as soon as possible.

INDOOR RULES

Rules Questionaire

The return is still very light on rules questionaires and it will soon be time to tabulate the results of those which are on hand. If there is not a larger return, it is possible that the results will not represent the true feelings of the majority of indoor fliers.

For that matter, the present returns would not even represent the feelings of the NIMAS membership - less than 25% of the membership has returned a questionaire.

Contest Board Action

Free Flight Contest Board Chairman Phil Klintworth has circulated the final ballot on the hand launched glider proposal which will eliminate "mike" gliders from competition against conventional thrown gliders. Phil has modified the wording (but not the intent) of the proposal in such fashion that present gliders are not outlawed as they were by the original wording. The changed wording appears on page 24 of the June Model Aviation, and the change removes the major objection to this rule proposal. Ballot deadline was July 1, but no report has been received on the outcome.

Also, just after publication of the June INAV, the final ballot on the proposal to add FAI Indoor to the AMA rule book was circulated.

MEET THE STAFF

In case any of you are wondering what it takes to put out this newsletter, here is a list of staff members and their duties:

Bud Tenny - reporter (news and info from any source, primarily by correspondence and lots of it), typing and arrangement of all material, collate all issues to be mailed, fold and staple same, keep track of subscription info and notify those whose membership is expiring, and other odd jobs.

Jody (wife and mother) - type labels, proof-read all material, tape folded issues for mailing, attach labels and stamps, and supervise the rest of the staff, besides all the other wifely duties.

Kevin (age 9) - stamp return addresses and help tape issues for mailing.

Kristi (age 7) - collate the file copies and help separate labels and stamps.

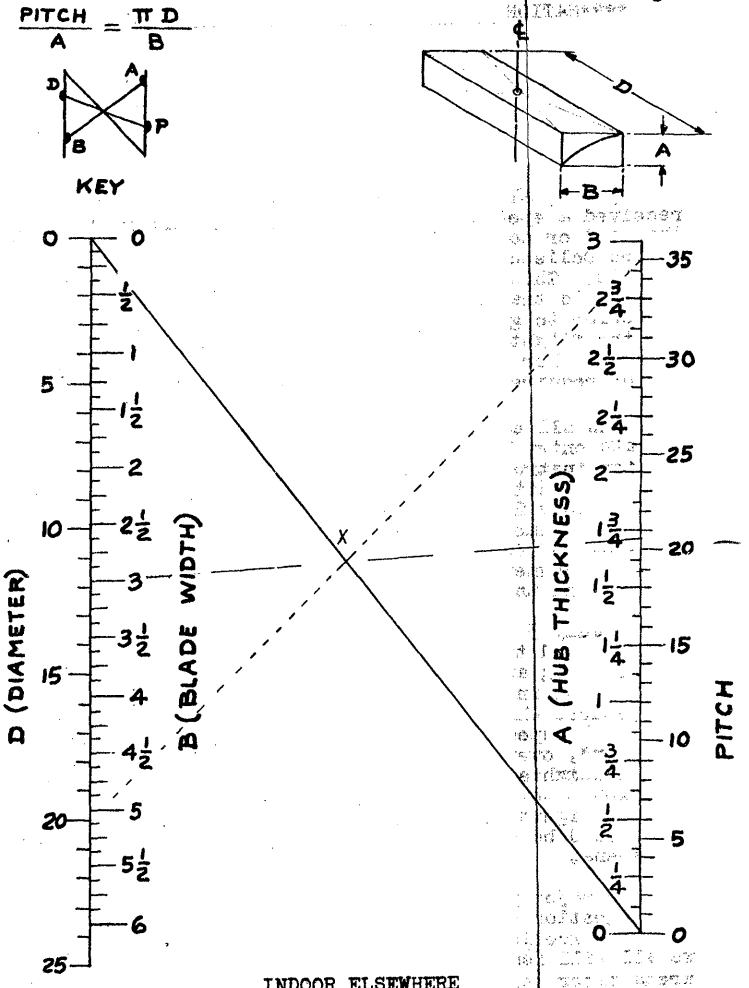
Kerry (age 5½) - separate labels and stamps so they can be attached to the mailing issues.

On the evening the newsletter is mailed (usually the tenth of any month), 200 issues are collated for mailing, folded, stapled, taped, stamped, addressed, sorted, and mailed. Expiration notices are made out and envelopes to go with them are addressed. The extra services (back issues, dacron, service requests, answers to problems and addresses of other members) are done in other "spare" time, along with the correspondence and requests for info on specific topics.

PROP FORUM

Each time we design a new prop, it is necessary to compute the dimensions of the block to build it on. This chart, drawn by Ray Wylie and sent in by Charlie Sotich, removes the work from the design of prop blocks.

The chart is used this way: Draw a line between pitch and the diameter scales to get an intercept on the solid diagonal line, then draw a line from the desired maximum blade width (block width) through the intercept; the second line will intersect the Hub Thickness (block thickness) scale. The example shown is for a 20 x 32 prop - the line (short dashes) from 20" diameter to 32" pitch gives intercept "X" and the line (long dashes) from 3" blade width through "X" gives 1 23/32" for hub thickness. Thus, the block for a carved prop would be 20" long, 3" wide, and 1 23/32" thick. To build a monospar prop the block would only have to be half that long.



INDOOR ELSEWHERE

Finland

In recent years the Finns have cut down the number of classes of indoor events to two microfilm classes plus a special class used in the yearly contest held on January 1. The two mike classes are: Under 35 cm. Span and Under 90 cm. Span (FAI). There are no other restrictions on these classes, which enables considerable time to be spent on each class.

In all of Finland they have very few sites - mostly low ceiling gymnasiums. Helsinki has the two highest sites in the country; "Otahalli" with 35' ceiling and "Messahalli" with 45' ceiling. In spite of this limitation, the Finns have made a good showing each year at Cardington. During good conditions in Messahalli top times have approached 21 minutes - good time anywhere!

The annual contest in Messahalli brings out the last indoor category. It is centered around a paper-covered kit named "Hyttynen" which has a 16.5" span and 3.2" chord and uses a solid prop. The different age classes have different weight restrictions as follows: under 16 - 15 grams; over 30 - 10 grams; between 16 and 30 - 4 grams (without rubber). The other weights (10 grams and 15 grams) are weights with rubber.

THE LAB

Part of the NIMAS search for measurement standards is concerned with simple equipment to make definitive measurements of various parameters and quantities which will affect the performance of our models. First comes the equipment; then a definition of how it is to be used - an agreed upon standard procedure which will enable everyone to duplicate a given test with a fair degree of accuracy.

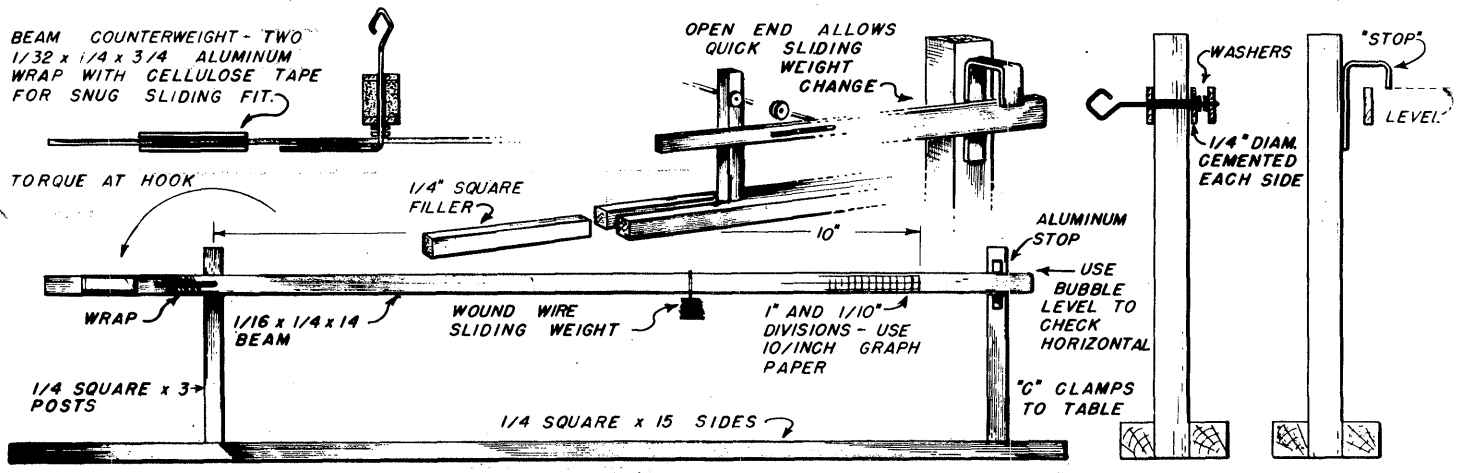
The sketch below is of a simple torque scale which can be duplicated easily and will fulfill the requirement of test duplication. The device was designed by Irving Sherman and drawn by Marvin Moss. Torque measurements will be as accurate as the construction of the scale and the calibration of the sliding weight.

The operation of the device as a simple torquemeter is straightforward: Hook the rubber loop to be tested on the hook, wind it in the manner you would at the field, slide the sliding weight along the beam until the beam is level and read the distance off the beam. The torque in inch-ounces is the product of distance (inches) from the weight to the hook times the weight (ounces) of the sliding weight. To plot a curve, let out a few turns and repeat the measurement. Continue to record torque versus turns for as many points as you desire.

The following is a suggested procedure for a definitive test of a rubber sample which will enable someone to compare their own rubber to a batch tested by the same method somewhere else.

1. Anchor the torquemeter and construct a bracket to hold a winder a specified distance from the torquemeter hook. Perhaps the bracket should be adjustable to permit the slack in the loop to be adjusted.
2. Make up a loop of rubber to a standard length (12" or 18") and record the weight of the rubber and cross section area.
3. Adjust the bracket so the loop has a standard amount of slack. For example, set the distance so the loop is snug and then move the bracket 1" closer. Some interesting data may result if torque readings are repeated with similar samples, as a function of slack.
4. Set the torque meter for a given increment of torque, apply turns until the beam balances and record the number of turns. Repeat this process until the torque is as high as desired.
5. Hold the torque at this maximum level for a specified time - say five minutes. Set the torque meter for the next lowest torque value recorded in step 4, let out turns until the beam balances and record turns. Repeat until all the previous points have been covered, recording turns each time.
6. Plot the data from steps 4 & 5 on the same graph. Both curves will contain useful information, and the area between the curves will be proportional to the amount of hysteresis the sample has. This information may also be useful in comparing samples of rubber from different sources.

Comments and modifications on the above procedure are requested - I'm probably overlooking something!



HINTS AND KINKS

Colored Condenser Paper?

Do you want some exotic colors of condenser paper for your latest scale job? Or a distinctive paper stick ship? John Chizmadia suggests this method: Use a clean, smooth piece of glass as work area. Paint the glass with colored ink, using a brush 3/8" to 1/2" wide, then quickly lay a piece of paper cut to the desired size on the glass this way: support the ends of the paper and blow on the center so the center touches first, then lower the ends in place. Now paint the top side of the paper with more ink and let it dry evenly all over the top. Peel up the edge of the paper and blow on the underside of the paper to dry the remaining ink on the bottom. The side next to the glass will have a hard shine or gloss which enhances the appearance of the tissue considerably.

Another Method

Fred Weitzel colors his condenser paper this way: While he is pre-shrinking the paper (by fastening the sheet to a wooden frame and water spraying), he uses ink of the proper color diluted with water in place of water to shrink the tissue. The frame must be tilted from side to side during the drying process to insure even color.

Wing Covering Hint

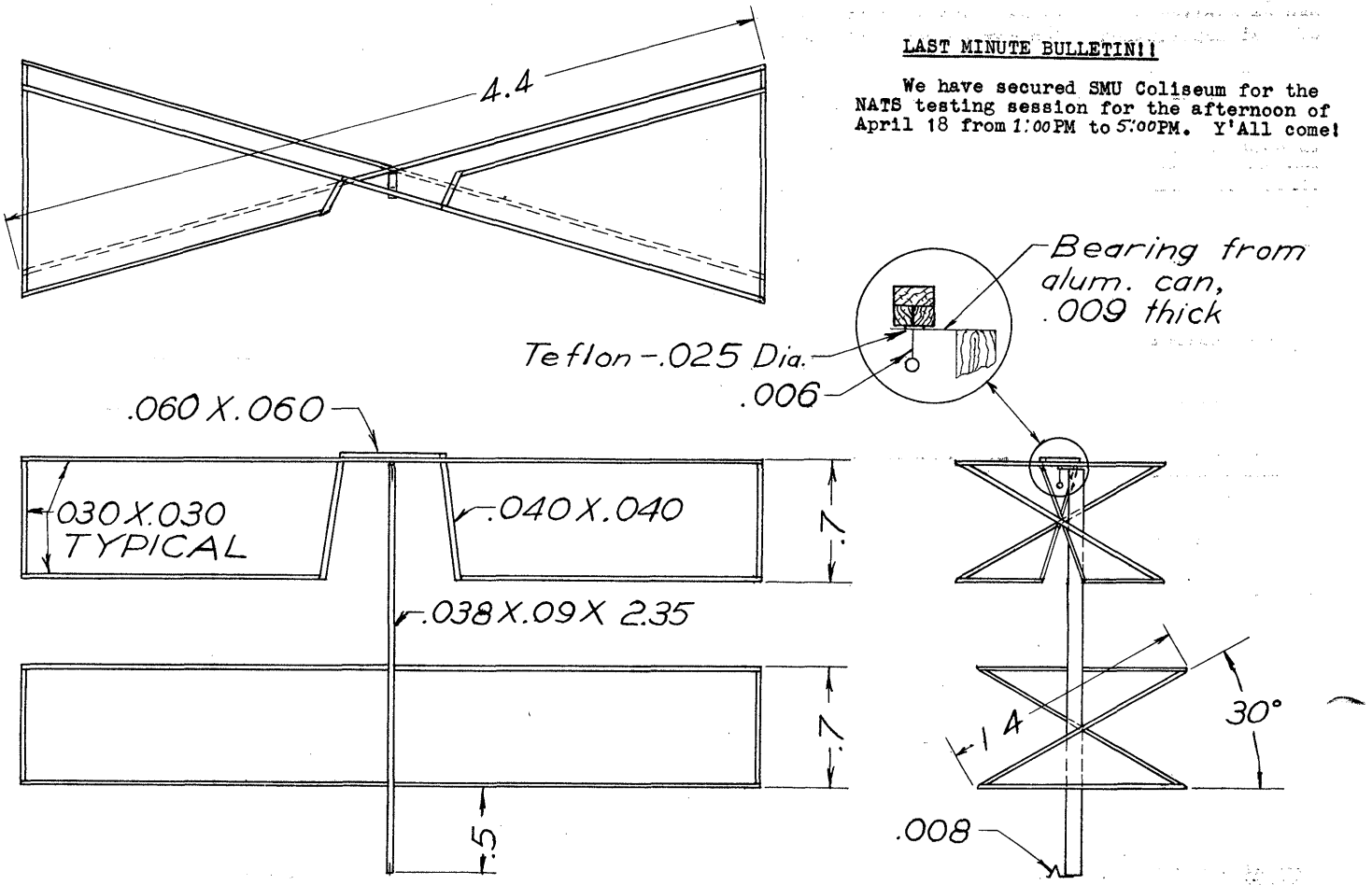
Depending upon how your film was aged and stored, the sheet may not have enough slack to use "as is." (Lew Gitlow suggests that film stored in moving air will slack up quite nicely in a week or so). Since my film is put into an airtight carrying case (no room in the closet - the same old story!), it remains relatively tight no matter how long it has aged. Thus, I have to slacken it enough to cover with, without destroying the sheet doing it. First, I cut two strips of newspaper 1/2" wide, wet them with tap water, and lay them across the end of the film about 1/16" from the end. Next, I cut the film loose between the paper and the end of the frame. Now, two strips of 1/16" x 1/8" balsa longer than the hoop are wet and laid lengthwise on the film, 1/16" from the edge of the hoop, and a drop of dilute Elmer's Glue is put between the strips of wood and the paper. After most of the water has evaporated (and the Elmer's has set), I pin the wood strips to the hoop and cut the film loose between the balsa strips and the hoop. In effect, this creates a hoop-within-a-hoop, but the inner hoop can be made narrower so the film droops slack in the middle. Put in just enough slack so the film curve matches the wing airfoil with the wing frame resting on top the film, and pin the balsa strips to the hoop again. Use a small soft brush wet with tap water, and wet the center rib and the dihedral ribs so they will stick to the film. Now, starting in the center and working toward the tips, wet the wing outline all around, making sure it sticks to the film all around. If you stick the rest of the ribs to the film (highly recommended) do this last. Let the wing dry out, then trim it loose. Be sure not to have a slick surface under the wing when it drops free - I pulled four holes in a "C" wing when it stuck to the table!

CHANGE OF PACE

Match Box Helicopter - "Boxer"

by Bill Bigge

The plans are self-explanatory (Ed. note - note carefully that the plans are not to scale. Follow the dimensions as a guide to construction), and the finished model will fit in a match box. The motor is a 2 1/2" to 4 1/2" long single strand of .025" Pirelli, or a loop of golf ball rubber. It has done 1:17 on 1160 turns in the living room, and is capable of a lot more if it is pushed a little. My model needs a little ballast on the bottom of the stick, but it might not if the pitch were raised a little.



LAST MINUTE BULLETIN!!

We have secured SMU Coliseum for the NATS testing session for the afternoon of April 18 from 1:00PM to 5:00PM. Y'All come!

A LOOK AT YESTERYEAR

The Baby ROG

by Justin Murray

The kit for the Baby R.O.G. was amazing, and its arrival one cold blustery day was certainly one of the most exciting moments of my life. It came in the mail in a cardboard tube, and contained one slab of 1" x 1/8" x 12" balsa, one stick of bamboo (like in a Chinese fortune telling deal), a piece of rather heavy piano wire, formed thrust bearing, some Jap tissue, a pair of red fiber wheels, and two vials of Ambroid and dope. Oh yes, and a small length of 1/16" square rubber for the motor. The price, I think, was sixty cents.

So for 60¢ the challenge was at hand. I worked slowly. It took me about a week of evenings to build the model, and another week to get it to fly. I simply could not get it trimmed out properly, and everyone else in the neighborhood knew less about it than I did, which was practically zero. However, I gave it that "if at first you don't succeed" bit, and one calm, cold, sunny morning it took off beautifully from our snow-encrusted yard, and circled leisurely for what seemed an eternity, ultimately coming in for the most gorgeous, smooth glide landing the world had ever seen! I felt like God! and I've been hooked ever since.

-30-

I'm sure that the above story invokes pleasant memories in many people - I remember similar experiences with a Jasco ROG many years later than Justin's story. Eventually I "graduated" to removing the gear and hand launching the model. This was on a Kansas farm, and the calves in the pen near the front yard soon learned to ignore the strange little "bird" I was flying!

NEWS FROM AROUND THE WORLD

CALIFORNIA - SANTA ANA

There is still a 14" gap in the end of the Santa Ana hangar where the door jammed - so far no attempt has been made to fix it. This has restricted serious flying to a great degree, since the air settles down about 4 PM, if at all. The Sky Hoppers of Orange County continue to hold record trials monthly; the remaining dates are July 12, Aug. 9, Sept. 6, Nov. 8, and Dec. 6. An open AMA indoor contest is scheduled for October 11.

ILLINOIS - CHICAGO

Although the Madison Street Armory is open almost every Saturday (it was closed once in the past 3 months), only a few fliers use it each week. Two of the regulars are Charlie Sotich and Wally Mumper - and they make full use of the Armory to prepare for the Nats. Some recent sessions have had exceptional conditions, and times were pretty high without even trying hard. Paper times range up to 17½ minutes, and the high FAI time was 26:27 by Charlie's new design with 2.4" longer inboard wing.

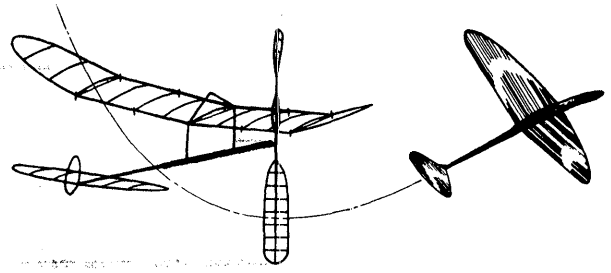
At present, no sanctioned sessions are planned for the Armory until about October. It seems likely that the Aeronuts will continue their efforts to encourage juniors to build and fly simpler indoor models - a commendable plan.

NEW YORK - ELMIRA

Most of the members of the Elmira Indoor Model Airplane Club are also active in FAI free flight events, s their weekly indoor activity has been suspended until the present round of qualification trials have been completed. They will be back at the indoor stand again before too long - this group is quite active.

The Voice of N.I.M.A.S. AUG·1964

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

1964 INDOOR NATS RESULTS

Indoor Stick

Junior

1.	J. Shepherd, Jr.	12:34.0
2.	Eric Vogel	12:28.2
3.	A. Markiewicz	9:46.0
4.	Steven Valerius	4:24.4

Senior

1.	Larry Loucka	19:18.5
2.	Mike Fedor	18:05.5
3.	Dave Erbach	17:16.2
4.	Steve Houlihan	13:40.0
5.	James Bradley	6:49.6

Open

1.	Charlie Sotich	27:44.2
2.	Bill Atwood	25:38.2
3.	Phil Klintworth	25:12.2
4.	Bruce Paton	24:39.2
5.	Bud Tenny	22:44.0
6.	Curtis Janke	20:01.8
	Jim Clem	18:52.0
	Walter Erbach	17:29.8
9.	Paul Crowley	16:47.4
10.	Bill Bigge	12:05.0

Paper Stick

Junior

1.	Eric Vogel	13:01.0
2.	A. Markiewicz	9:32.0
3.	Steven Valerius	5:21.0

Senior

1.	Larry Loucka	16:03.2
2.	Mike Fedor	10:22.0
3.	Dave Erbach	10:21.0
4.	W. H. Vanderbeek	10:00.8
5.	Steve Gibbs	8:30.2

Open

1.	Phil Klintworth	19:41.0
2.	Walter Mumper	19:03.6
3.	Charlie Sotich	18:40.8
4.	Bill Atwood	17:38.8
5.	Paul Crowley	14:51.0
6.	Bud Tenny	13:53.0
7.	Jody Tenny	13:03.0
8.	Bruce Paton	12:22.0
9.	Mark Valerius	11:17.8
10.	Jim Clem	10:56.6

Indoor Cabin

Junior

1.	J. Shepherd, Jr.	4:53.2

Senior

1.	Larry Loucka	18:06.4
2.	Dave Erbach	11:02.0
3.	Mike Fedor	10:10.0
4.	Steve Houlihan	8:22.0
5.	Steve Gibbs	7:21.9

Open

1.	Charlie Sotich	17:54.8
2.	Walter Erbach	13:52.2

Indoor HLG

Junior

1.	David Maystead	0:46.4
2.	Thomas Milla	0:42.8
3.	A. Markiewicz	0:42.4
4.	Gary Hammond	0:38.0
5.	J. Shepherd, Jr.	0:37.6

Senior

1.	Larry Miller	0:59.6
2.	Faust Parker	0:56.6
3.	Jerry Chambers	0:55.2
4.	Mike Fedor	0:53.6
5.	James Lewis	0:53.4

Open

1.	Reid Simpson	1:01.4
2.	Neil Kasmar	1:01.4
3.	Lee Hines	1:01.0
4.	Robert Hanford	0:56.2
5.	Paul Crowley	0:54.2
6.	A. Zimmerman	0:53.2
7.	Jack Bomar	0:52.2
8.	Lee Polansky	0:50.2
9.	Dave Kelly	0:48.2
10.	Tom Hutchinson	0:47.6

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

E. E. WOLFE, 131 Wildwood Dr., Elk Grove, Illinois

Nats Aftermath

First on the agenda - a word to those of us who won a trophy at the Nats this year. Right at the bottom of your trophy is the name of a firm or person who donated the trophies for your event. Take a few minutes to drop them a line and say thank you - one of the hardest jobs faced by the AMA each year is to find sponsors for Nats trophies, and the least we can do is to say thank you so the job will be no harder next year.

The second thing - of equal importance - was a lack of Junior entries this year. I know of at least a few junior types who were entered and were unable to make it at the last minute - but we need more Juniors than that. A few clubs and individuals are making a big effort to help interested youngsters, but each of us should help. The Juniors need help, instruction and transportation to contests. Keep Indoor growing with new faces!

Taut Film Comments

The first published information on German type taut film (so far as I know) appeared in the Aug.-Sept. 1964 issue of FLYING MODELS. The info appeared as part of the article "The Indoor Intruder" by Joe Bilgri. If you haven't seen the article, look it up. It is a good one, with two film formulas and a good outline on building stressed elliptical dihedral. Thanks to Joe and FLYING MODELS for getting the info into print.

NIMAS Meeting

No advance planning for a NIMAS meeting was made, since no one knew where anyone else was, or even if they were in town. Finally, in the closing hour of the rubber session, we took a poll of those present and decided to

1964 Indoor Nats

A casual look at the results above reveals one thing immediately - there weren't many of us at the Nats. This was reflected in all the events - not just Indoor, since there were only about 800 entrants and only about 630 actually made it out to fly.

The lack of entrants didn't affect the quality of flying - seven new records were set in the rubber events, most of them a substantial increase. Larry Loucka made a clean sweep of the Senior rubber events, setting a new record in each event and winning the Stout Trophy for the longest cabin flight of the day. Charlie Sotich's long practice paid off also - he won first in Stick and Cabin and third in Paper Stick. The two Juniors who divvied up the hardware in the rubber events - Jesse Shepherd and Eric Vogel - were both newcomers to Indoor. Jesse has flown outdoor FF for some time, but the Nats was his first indoor meet; Eric's contest flying started with indoor models.

Much credit for the new records and fine flying was due to the unusually stable air in the Coliseum - we had almost zero drift during the whole 6½ hours of flying. Also, there was excellent cooperation from all the people who flew - ground turbulence was low and there never was a large group of people out on the floor at any time. Thanks also to AMA HQ for setting up the special contestant ID system which made it possible to limit access to the flying area to bonafide contestants.

Something we can laugh about now might have been more serious if there had been many more contestants or a lot of turbulence. Great care was taken to see that we had helium and balloons and that the helium bottle had the proper adapter so the balloons could be filled. Alas! We got two and one-half balloons full of helium and the bottle was empty. A hurry-up call to the Navy produced a replacement bottle - and no wrenches to change the fittings to the new bottle! Charlie Sotich saved the day with his trusty beach ball loaded with hydrogen, so all is well that ends well. Incidentally, Charlie donated

NIMAS (cont.)

meet at the B.O.Q. at Dallas NAS as soon as we could get together after the close of indoor.

The meeting started with three of us wandering all around the B.O.Q. area watching for the others to show up. By 11:30 eight or ten of us had gathered in Phil Klintworth's room - and it went on until about 1:30 AM. In the meantime there was a free-swinging discussion of various technical topics, the Junior problem, more and better publicity for model airplanes in general and indoor in particular, how to get experienced modelers to try indoor, and the World Indoor Championships (see FAI INDOOR REPORT). Mostly, it was a very satisfying bull session, but no momentous decisions were made.

"CIRCULAR AIRFLOW"

Frank Zaic's new book, "Circular Airflow and Model Aircraft" has been delivered and it lives up to expectations as an excellent and definitive work. Anyone who flies model airplanes can find much of interest in this book. Frank's address is Box 135, Northridge, Calif.; the price is $3.

INDOOR RULES

Contest Board Action

In recent action the FF Contest Board gave preliminary approval to the proposal to change the method of scoring indoor HLG. Originally this proposal was the Wilmington-Detroit-Chicago proposal that indoor HLG be scored on the total of the best three out of not more than nine flights. This was rejected by a narrow margin, and the accompanying remarks indicated that the principle was acceptable. So Phil Klintworth changed it to the best two out of not more than nine flights; the approval enters the proposal into the study period.

The proposal to add FAI Indoor models as a new AMA category was also passed - presumably this will be in time for the new category to appear in the 1965 AMA Rule Book.

FAI INDOOR REPORT

Postponed!

Just before the Nats, word was received from England that the World Indoor Championships will not be held this September as originally scheduled. The reason for this was a lack of entry - at the time of the entry deadline only Finland and the United States had made formal entry. Great Britain had not chosen a team due to difficulties in obtaining Cardington, but there was intent to field a team.

Naturally, this matter came up for a lot of serious discussion at the NIMAS meeting held right after the end of indoor flying at the Nats. Those present agreed upon presenting a case to re-instate this Championship event next year without disrupting the regular schedule which calls for another Championship in 1966. Also, a special effort is to be made to set up a network of communications between the Aero Clubs of all nations involved with the idea of coordinating all the efforts and also to get some advance warning if a similar situation might develop again. Finally, all possible efforts will be made to build up interest in several other countries so there is a better chance of getting the minimum of five entries required to give the event international competition status. As it was, all it took was for one country to miss a year and the event was off - this time two dropped out. If any of our readers correspond with fliers in another country - now is the time to spread the word!

1964 Indoor Nats (cont.)

the colorful balloons and the monofilament nylon tethers that we used during the meet.

Hand launch glider times were disappointing, especially to the fliers. The site was air-conditioned until two hours before the meet started, and the air was cool until after noon - this may have been the reason for the low times. Quite a few Sweepettes were flown, and many of the originals showed Sweepette influence. One Hi-Hat showed up, and the remainder of the originals covered a lot of design territory. Most of the fliers were putting heart and soul into their launches, but one Senior had a casual left-handed flip combined with a left-left pattern which made good use of the small floor area. It ended with a tie between Reid Simpson and Neil Kasmar for Open honors - the nod went to Reid on the basis of the best supporting flight. After the tie-breaking decision was made, Ray Lipsey (FF Category Director) asked Frank Ehling how he would break a tie in IHLG. Frank replied, "Grasp each glider by the nose and tail and bend the fuselage double. The winner is the one with the longest pieces."

A brief look at the statistics - 72 HLG fliers out of 105 entrants made 555 official flights for a total air time of about 4.7 hours. These same fliers made about three times as many test hops - so the air was always filled with models. The rubber events had 50 fliers out of 76 entrants actually make official flights; the total air time was 23.3 hours and the average length of the 121 flights was 11:33.

RECORDS? MAYBE!

NATIONAL MODEL AIRPLANE CHAMPIONSHIPS, July 20, 1964
Cat. II, Will Rogers Coliseum, Ft. Worth, Tex. (93')
Jr. Paper Stick - 13:01.0, Eric Vogel
Sr. C Stick - 19:18.5, Larry Loucka
Sr. Paper Stick - 16:03.2, Larry Loucka
Sr. C Cabin - 18:06.4, Larry Loucka
Open Paper Stick - 19:41.0, Phil Klintworth
Open B Cabin - 13:52.2, Walter Erbach
Open C Cabin - 17:54.8, Charlie Sotich

HINTS AND KINKS

Looky, Ma! No Jig!

Eric Greenwell suggested this method of wing bracing as used by Ray Harlan: Fasten the wing posts upright (Ray glues them to a sheet of glass, and checks to see if they are perpendicular in all planes) and spaced exactly the width of the wing. The wing is glued in place to the posts, while being supported at the dihedral breaks with short pieces of wood. Install the cabane and your favorite type of "goodies" to hook the wire around, then put on the primary and secondary bracing. Double check the alignment of the wing (if you use washin, this is put in by making the wing supports the proper length) before the wires are glued down all around. Finally, install the tip dihedral and the tip bracing if you use it.

An editorial comment on this system - I was dubious about this bracing method until I tried it. All my old bracing jigs are about to get the heave-ho - they are now excess baggage. This system will accomodate any type of dihedral (except possibly stressed elliptical dihedral), and any size of wing. One of the reasons I haven't made anything except wings with parallel chords is that I did not want to make a bunch of new jigs - now the wing shape doesn't matter.

PICTURES FROM THE NATS

UPPER LEFT
The site - taken during the last part of the HLG session.

UPPER RIGHT
Bill Atwood launches the second place Stick model - a geared model swinging a 20" prop.

CENTER LEFT
Charlie Sotich puts away his Cabin model after winning the Open Cabin event and setting a new record.

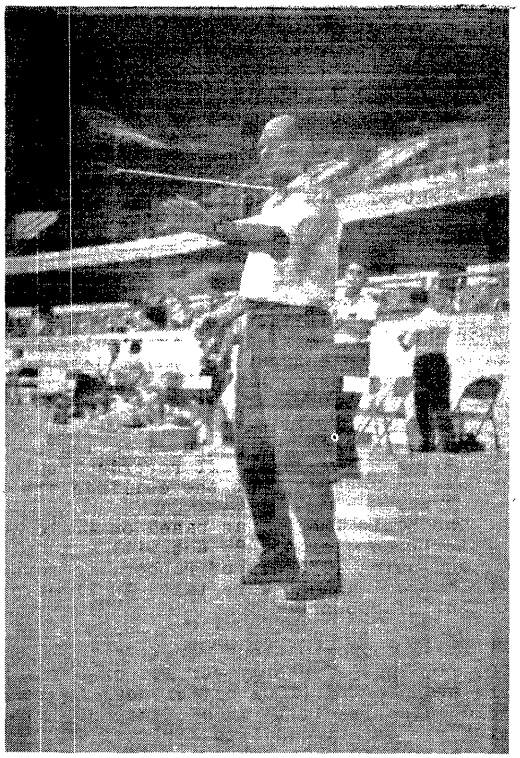
LOWER LEFT
Quite a chunk of Junior hardware! Jesse Shepherd, Jr. on the left with 1st in Stick, 1st in Cabin and 5th in HLG; Eric Vogel on the right with 1st in Paper Stick and 2nd in Stick.

LOWER RIGHT
Walter Erbach with record-setting B Cabin.

INDOOR FLYING SCALE

The Indoor Scale group at Wilmington, California have come up with a new scale event - Easy-Built Flying Scale. These models use all sheet wood construction, have a max. span of 24" and the prop is limited to 35% of the span. Kits may be used, and non-kit models must have 3-views or pictures with them to prove the model is recognizable and reasonably to scale. All flights must R.O.G., and scores combine workmanship, finish and flying points.

The scale contests at Wilmington are held every two months, usually on a Friday evening from 7 PM to 11 PM. Vic Hardin is the scale CD, and he usually has a large entry to contend with, since this is a very active group.



LOW POWER MODELS - TRICK OR TREAT?

In the October 1963 issue I advanced the concept of using small amounts of rubber on Cat. I and Cat. II models as a means of limiting the altitude gained by the model. Later I gave a very sketchy preliminary report and some observations based on very limited experience. As my interest in the subject grew (very nearly becoming an obsession) I added to the concept and theory until it has expanded to a concept of high efficiency for all indoor flying.

Before I go further, let me define "efficiency" in the light of this discussion:

$$\text{Efficiency} = \frac{(\text{flight time in minutes})(\text{model wt. in oz.})}{(\text{rubber wt. in oz.})(\text{ceiling in feet})}$$

For purposes of model evaluation, the ceiling should be the actual altitude reached by the model; and the term would be actual efficiency in minutes/ft. of altitude. For comparison between several models in the same site on the same day, use the building ceiling height and call the result relative efficiency. Note - by my definition Cat. I models would be more efficient than the best Cat. III models, which isn't true - at least with present models. However, Cat. III records aren't twice as high as Cat. II records, but the ceilings are twice as high!

The basic theory was based on Ernie Kopecky's Class D Stick record of 43:42, set with a model weighing .039 oz. and using .039 oz. of rubber; to furnish a reference some approximations were taken in light of the energy content of rubber.

These approximations were: Pirelli can store about 3000 ft. lbs. of energy per lb. of rubber; if this energy were transformed (100% efficiency) into altitude, pirelli could raise itself to an altitude of 3000 ft. If a model using rubber wt. equal to airframe wt. (100%) could use the total energy in the climb (100% eff.), the maximum altitude of the model would be 1500 ft. Current practice uses about 40% of the energy stored for climb; this would limit the model to 600 ft.(100% eff.).

If we assume that present-day models are only about 30% efficient, models with a 1:1 ratio should peak out at 180' - about 30' higher than present sites. To put it another way, full winds on the model would cause it to bounce around in the top until the excess energy was used up or until it hung. Ernie admits he was lucky - he did bounce around for some time and got a new record. His next attempt did hang, and he didn't get it back.

At this stage of the game, the low power theory is outlined in these terms:

1. The optimum weight of rubber for any given site (to keep the model out of the top) will be expressed by a straight line between these points: 50' - rubber weighs 40% of airframe; 180' - rubber equal to model weight. Other points: 30' - 32% rubber, 75' - 50%, 100' - 60%, 150' - 80%.

2. The required weight of rubber will be made up into a loop which will be 20% longer than between hooks. It is certain that the amount of slack will be an important factor during the cruise, but many more flights must be logged to evaluate this factor.

3. The propellor size and design will be chosen to let the model dead-stick right at the floor. So far, low pitch/diameter ratios seem to work best - 1.5:1 is a good place to start.

4. Maximum turns will be installed without backing off. So far, no one has managed to get a proper combo of prop and rubber to permit this ideal.

The goal behind this approach is to find a rule-of-thumb which will enable a flier to reach near optimum times in a site without having to make numerous test flights. The rubber will be figured on the basis of model weight; our present experience seems to indicate that the prop will be fairly optimum if chosen on the basis of rubber cross section area. Note that this will result in about the same size prop being used on models of similar weight, regardless of model size. That is, a light paper ship and medium weight FAI might use the same prop design.

To my knowledge, this technique has not been used in competition except for my entries in the Nats, and these models were not set up exactly by the theory. The data on the models is as follows: Indoor Stick - 185 sq. in. wing, model wt. .042 oz., rubber wt. .026 oz.(62%), 1860 turns in and 60 backed off, landed with 30 turns, flight time 22:44 for 77 RPM. Peak altitude was about 75', about 10' below the obstructions. Paper Stick - model wt. .044 oz., rubber wt. .024 oz. (55%). Turns were nc recorded, flight time 13:53. Maximum altitude 85' with the model touching about ten times.

Frankly, the paper stick time was lousy. I have decided that the prop was not nearly optimum. With my usual hindsight I decided that the FAI was out of trim. The final test flight at the SMU session on the previous Saturday gave an RPM of 63, but I didn't figure the RPM for the Nats flight until the next day - to my disgust. I then examined the model and found that the last adjustment on the tail incidence had slipped and the decalage was less than for the 63 RPM flight. It is foolish and depressing to speculate on what might have been, and I am quite happy with the flight as it stands.

I quoted the above numbers to give an indication of the possibilities of the technique. Since I am now not able to make regular flights in any site (except perhaps some T-Hangars at a local airport), I would very much like to have some help in gathering data about flights made under low power conditions. I have strong-armed a few people into helping me, and these people are making tests as their time permits.

If you are interested in helping me, drop me a line describing the model you want to use, and the site you fly in. I will specify props and motor, maybe even design props to fit the situation. I will want to record the model weight, rubber weight, turns put in, turns left on landing and the flight time. It will be a lot of work, but if you are interested in helping advance the state of the art, let's dig in! It may all be a pretty bubble which will burst, but that 22:44 was the fifth flight on a new model and prop - the promise is bright!

NEWS FROM AROUND THE WORLD

CALIFORNIA - CHINO

Mr. W. R. Snedden, Model Club Sponsor at the California Institution for Men, reports that several members of the club are interested in indoor models and that he expects more interest as others get to see them in action. Warren Williams has been working with the group and has set up instruction sessions.

CALIFORNIA - SANTA ANA

The hangar door remains open, but the fliers have moved the events around in the hangar until pretty fair conditions are available if the outside conditions aren't too bad. The Sky Hoppers have record trials scheduled for Sept. 6, Nov. 8 and Dec. 6; an open contest is set for Oct. 11.

ENGLAND - CARDINGTON

Bad news piled upon bad news for English indoor buffs this summer as Cardington changed ownership. First, they are charged for using the shed, the World Championships were called off, and now the August session may also be called off. The final blow is poised - the hangar is to be sold for scrap. One bright hope - the asking price is something like $420,000 and it may take a while for anyone to scare up that much cash.

HOLLAND - ROTTERDAM

Cornelis Wolthoorn hopes to be able to set up an indoor session and record trials in Rotterdam this month. An article about Wolthoorn and his current record model increased the interest in indoor models and dispelled the idea that a blimp hangar was necessary for indoor flying. Thus he hopes that more interest and some actual flying will result among the Dutch modelers.

MICHIGAN - DETROIT

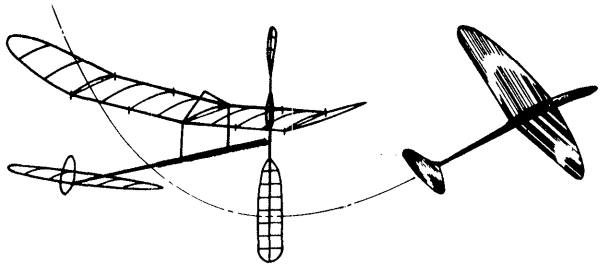
It seems that Cobo Hall, once a bright hope for a new site in Detroit, remains too drafty for serious flying, but the State Fair Coliseum has remained available all summer. A very few fliers have been taking advantage of the site, but those few, including Ed Stoll, have been quite regular in their practice sessions.

PENNSYLVANIA - PITTSBURGH

Ron Ganser's small-but-handy site was lost when it became a storage area, so Ron and the other indoor men in Pittsburgh are now site hunting again. They scheduled a demonstration of indoor flying in the Soldiers and Sailors Memorial Hall last week, and hope to get permission to use the place for regular flying.

The Voice of N.I.M.A.S. SEP·1964

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members

Prof. MIKLOS BENCZE, School of Music, Baylor University, WACO ~~Austin~~, Texas
TIM LAVENDER, 4397 East Mound, Columbus, Ohio.

AMA Elections!

Although the nominations for 1965 AMA elective posts were made at the Nats, it most likely will be the October issue of MODEL AVIATION which lists the nominees and publishes available information about them. This month is not too soon to become concerned about the matter of elections, and to make a special effort to return your ballot. For those who really care, it should be possible to find out who the nominees for your district are by contacting the AMA VP for your district.

Who Cares?

The June and July issues of INAV announced that Bob Champine had been appointed as a representative from AMA to CIAM for the November '64 meeting. The articles went on to plead for everyone to express their feeling to Bob about how he should vote on the British proposal to lower the span of FAI Indoor models to 65 cm.

During August I had a chance to visit with Bob; at that time there had been only about 25 comments sent to either AMA HQ or to Bob. Many people who like the rules as they are don't voice an opinion, thinking it doesn't matter. It is very unreasonable to expect AMA HQ to read your mind - if you don't speak up the only possible conclusion is that you don't care. To quote Bob on this matter, "I find that it is very important to keep AMA HQ informed as to personal feelings about rules, contest procedures, etc. Without a letter, any griping is for naught; you may as well talk to deaf ears. Letters to AMA, Contest Board members, committee chairmen, etc. are much more effective than most people think - it takes letters, letters and more letters."

Postal Contests

Winter draws nigh and soon there will be many small groups with their own sites - and not many opportunities for competition with outsiders since so many of us live so far apart. As suggested before, postal contests seem like a fun-filled way to liven up your flying sessions and to get better acquainted with groups from other areas. For HLG fliers, how about an equalizer to minimize the differences in ceiling heights? For example, if two groups would like to have a postal challenge in HLG but their sites are 20' and 28' high respectively, there is a problem. As a start, let the first group multiply their times by 35/20 and the second group multiply their times by 35/28; this should give us enough experience to see if this type of multiplier will work. If you are not acquainted with a group similar to yours, and would like to try postal contests, drop me a line at Box 545, Richardson, Texas, 75081, and I'll try to put you in touch with a group.

New Materials

Sig Mfg. Co. has marketed a new rubber which prelim-inary testing shows to be equal to or better than Pirelli ubber at its best. On page 63 of the Sept./Oct. '64 AMERICAN MODELER Larry Conover reports the results of his testing; on the basis of this report I purchased some of the rubber. My own testing has been limited, but so far I have had no reason to doubt that this is good rubber. It is marketed under the name Powerstrip, and my batch measured 1/4" wide by .032" thick.

Back Issues?

We have back issues of INDOOR NEWS dating from Jan. '63, and NIMAS members may get a set by sending 35¢ (in stamps preferably) to cover postage and handling. Other subscribers may complete their collections at 10¢ per issue - tell us what you want!

FAI INDOOR REPORT

The AMA has submitted their suggestions for the CIAM Agenda in the form of a ten page memo. The indoor part of this memo is brief and to the point. We have gone on record as opposed to a change in specifications of the FAI Indoor model. In addition suggestions were made to initiate discussions on methods of increasing participation in the Indoor World Championships; the possibility of re-scheduling the 1964 World Champs; and finally to set up a network for communication and information exchange between all countries interested in Indoor.

After reading this entire memo, I must congratulate all who had a hand in preparing it - all the proposals are well conceived and the wording is clear and concise.

A LOOK AT YESTERYEAR

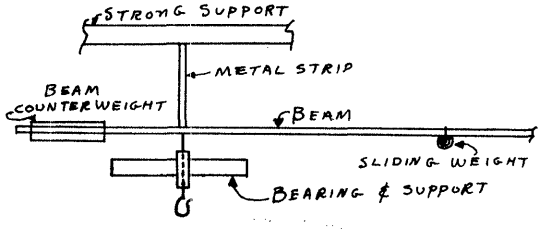
In the June issue Bill Tyler asked when an indoor pusher was last flown. Sez Charlie Sotich, "Bud Wolfe flew a paper covered canard pusher down at the Armory this past winter. I don't think it was a very new model, probably a year or more old. It is a stable flier but it wasn't outstanding with regard to duration."

Have you ever wondered why our models have a separate motor stick and tail boom? Bill Tyler revealed in Bill Winter's PLAN BOOK that early rules limited indoor models to fifteen inches between the thrust bearing and rear hook. The models which resulted were short coupled and pretty unstable. The problem of longitudinal stability was solved when some unknown builder added a tail boom to lengthen the tail moment - and times soared to new highs.

THE LAB

Torque Meter Follow-up

The July issue detailed a beam torquemeter designed for definitive rubber measurements. Bill Bigge offers the following comments: "Bearing friction will be significant, especially if measurements are made in the process of winding with a normal amount of stretch. Friction can be eliminated by using a thin wire or strip in tension to oppose the tension of the motor. I use a strip .001" x .018" from a stainless steel sponge. During unwinding at least, torque does not follow a smooth curve. It seems to increase suddenly as a knot goes out, then decreases until the next one goes out. To get a good value of torque it might be necessary to observe the average value for several turns. The clockspring torquemeter may actually be more accurate than the pure beam balance in that one can integrate by eye, so to speak. A low range clockspring torquemeter with a long, light, stiff pointer and maybe a ten gram sliding weight may be the best combination." Below is a sketch of Bill's bearing system for his torquemeter:



STATE OF THE ART

"Dram Dip"

by Charlie Sotich

While the best time of this model (27:44.2) is nearly identical to that of its predecessor, it does show promise of being able to do better. I would say that this is due mainly to its 21" diameter, 36" pitch prop. Although this model is a real heavyweight by current FAI practice, (.053 oz. for the plane and about .070 oz. more for its .080" Pirelli motor), the average prop speed is only about 42 to 45 RPM. This is about 10 RPM less than that obtained with a 20 x 36 prop used earlier.

Because the Madison Street Armory is available to Chicago area indoor fliers nearly every Saturday of the year, this model was built to meet the conditions of this building. Except for the summer months some drifting can usually be expected. This means that balloons are used to guide the models and sometimes models will get caught in the lights or girders. To get as much flying time as possible without spending the intervening week repairing or making new parts, it is easier to build a slightly more rugged model. The bracing has been kept to a minimum to avoid snagging on obstructions which can make removal using a balloon more difficult. The advantage of this heavier type of construction is that the models can be thoroughly test flown well in advance of a contest so that you can get a reasonable prop and rubber combination that will give good results.

Because there wasn't any FAI indoor team selection in 1964, I decided to try out a number of changes on an FAI size model. Since so many things were changed it is not possible to accurately evaluate what helped or hurt the model's performance. The wing has one more rib space on the left side which makes the left side 2.4" longer. No washin has been necessary in the left wing with this increased offset. This can be considered an improvement since the wing will be operating at a more nearly uniform angle of attack. It is also easier to make a new wing flat than try to guess the amount of washin required.

A smaller than usual stab (24%) was tried to see if the efficiency (sinking speed) could be improved as some calculations by Walter Erbach had indicated. I don't know if it improved the flying any but it takes less room to pack. A somewhat longer than usual tail boom is used to maintain the stability with the smaller stab and the same C.G. location. The fin was moved to in front of the stab to make it less vulnerable during balloon retrieving and it simplifies packing. The longer moment arm and small stab give this model proportions closer to a Wakefield model or a Nordic glider, rather than the stubby appearance of some early FAI models which had proportions more like the early FAI Power models. My timer at the Nats had no trouble telling which model was mine!

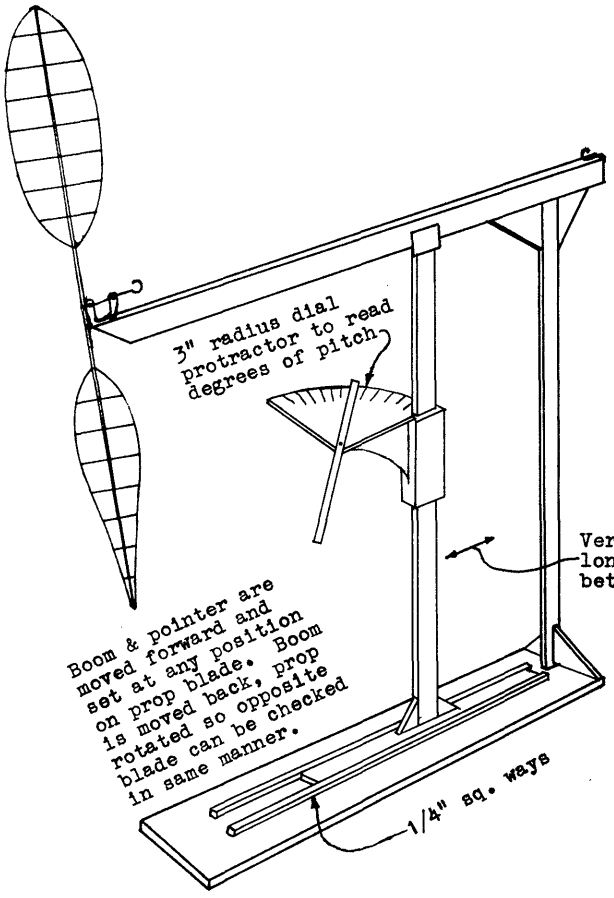
On the winning flight at the Nats a 19 3/8" loop of .080" Pirelli was used for power. 1760 turns were put in the motor and 160 turns were backed off before launching. At the end of the 27:44.2 flight 400 turns remained. A shorter motor might have done a little better. The average prop speed was 43.2 RPM.

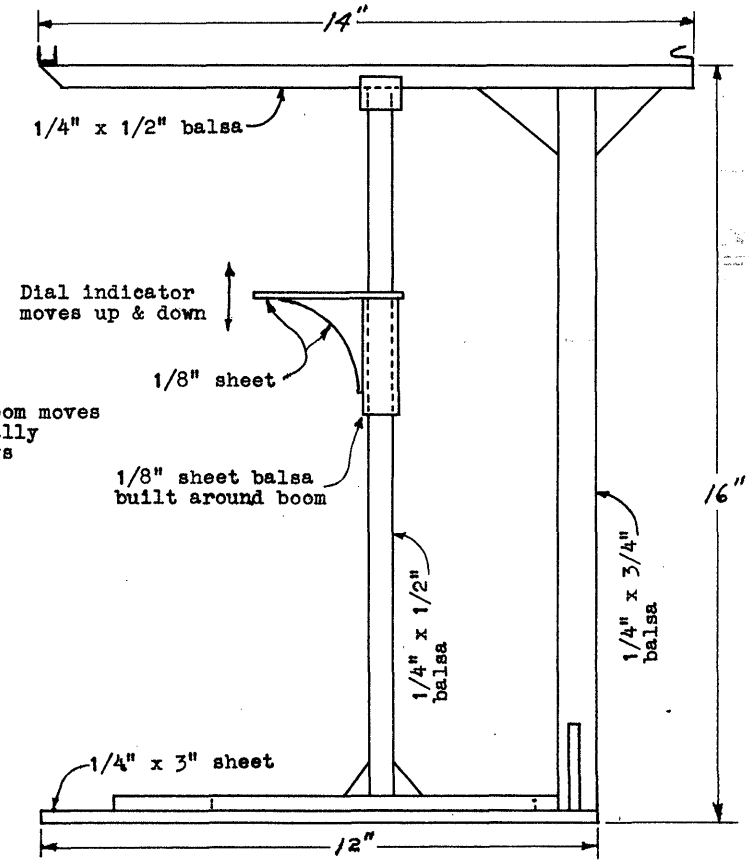
PROP FORUM

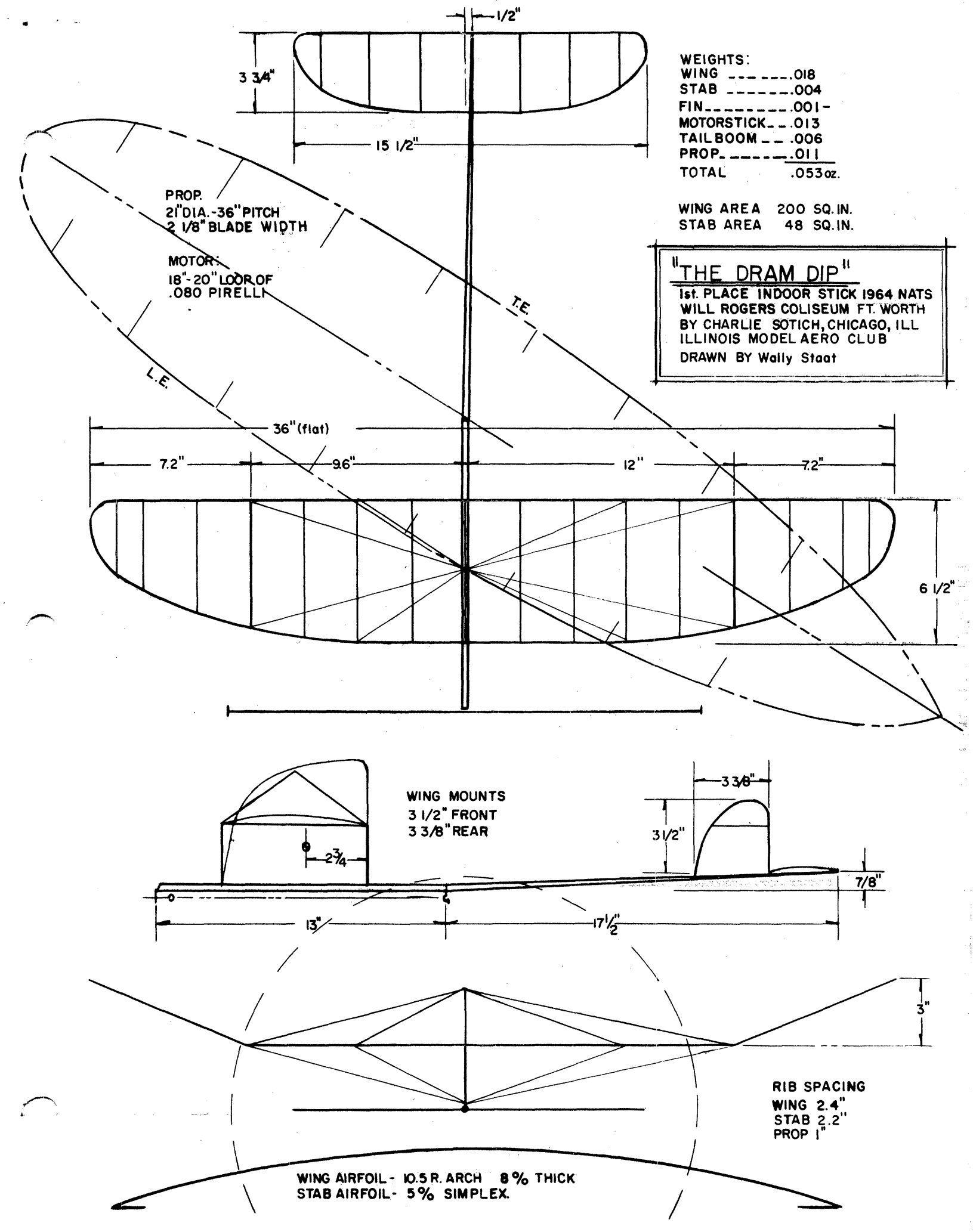
Pitch Checking Jig

C. V. "Russ" Russo built the jig shown below to check pitch distribution on his props, and to see that each prop had matched blades - very important for smooth operation in flight. To use the gadget, slide the vertical boom forward until the protractor arm will touch the back of the prop blade. Turn the other blade around and check to see that it has the same angle. Move the protractor up and down to check angles at other places on the blade.

At the present time experiments are being made with props which have pitch distribution other than standard - that is, non-helical pitch. If these prove to be better than present props, this type of gadget may be necessary to define and describe the new props.






1/2"
3 3/4"
15 1/2"
PROP.
21"DIA.-36"PITCH
2 1/8" BLADE WIDTH
MOTOR:
18"-20" LOOP OF
.080 PIRELLI
T.E.
L.E.
36"(flat)
7.2"
9.6"
12"
7.2"
6 1/2"
WEIGHTS:
WING .018
STAB .004
FIN .001
MOTORSTICK .013
TAILBOOM .006
PROP .011
TOTAL .053oz.
WING AREA 200 SQ.IN.
STAB AREA 48 SQ.IN.
"THE DRAM DIP"
1st. PLACE INDOOR STICK 1964 NATS
WILL ROGERS COLISEUM FT. WORTH
BY CHARLIE SOTICH, CHICAGO, ILL
ILLINOIS MODEL AERO CLUB
DRAWN BY Wally Staat
WING MOUNTS
3 1/2" FRONT
3 3/8" REAR
2 3/4
3 3/8"
3 1/2"
7/8"
13"
17 1/2"
3"
RIB SPACING
WING 2.4"
STAB 2.2"
PROP 1"
WING AIRFOIL - 10.5 R. ARCH 8% THICK
STAB AIRFOIL - 5% SIMPLEX.

LOW CEILING FORUM

The Ideal Site

Since most of the sites in this area have beams in the ceiling, I have had ample opportunity to observe models hitting beams regularly. It occurs to me that beams may be used to good advantage - if they are the right kind of beams.

Beams come in a variety of sizes and shapes, but only two general types. Regardless of the construction of the beams, they are arched or peaked or else they have a main member which runs parallel to the floor surface. I will deal mostly with the second type (level beams), since my experience with peaked and arched beams has been 100% bad - that is, when a model hits a sloping beam, the prop usually touches first while the inboard wing passes below the beam. The model them slides down the beam some distance before dropping free. The model heading has not changed very much and the model is now lower and closer to the wall. It usually takes about two such passes to terminate any flight - no matter how well centered it was before the collision with the beam.

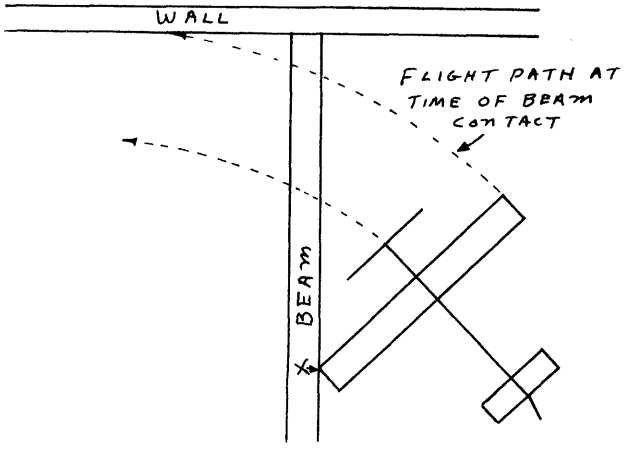
At one time I felt that the ideal low ceiling site would be the one with a smooth ceiling - but it now seems that the straight beams may prove to be superior. My reasoning is this: in the smooth ceiling much of the natural turbulence and drift accumulates in a narrow layer near the ceiling. If models are to fly very long they must spend a lot of time near the ceiling in the drift - and away they go!

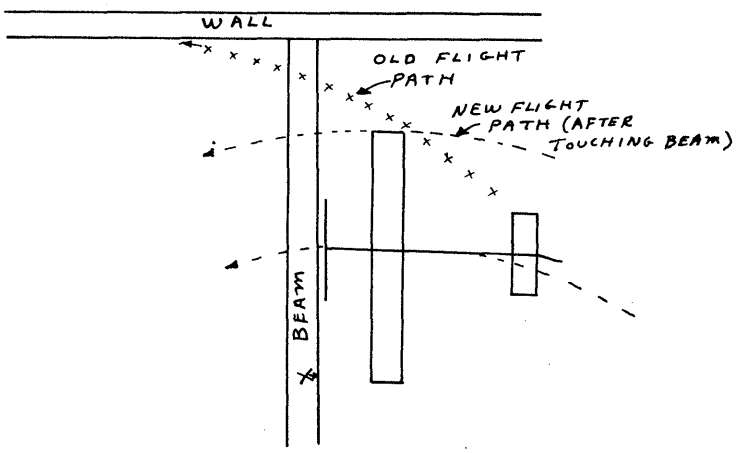
In a site with beams, the bad air still accumulates near the top - but the beams keep the model below most of it. Thus, if the model will climb slowly to the beams, touch, then drop below the beams for another try, it will fly as long as it stays centered.

Most of the time when a model hits a straight beam, the new flight pattern is better centered and the loss of altitude is slight. It seems to work this way: when the model approaches a beam at an angle and hits wing tip first, the model pivots into a head-on attitude before dropping free. The result is that the flight pattern has been shifted so the area of contact on the beam is tangent to the flight circle (see sketch below), and most of the time this is good. The pattern is unchanged if the model hits a beam head-on - it just drops below the beam and flies on. Thus, collisions with straight beams may improve the flight pattern, but seldom make it worse.

Part of the success of this phase of flying is related to the diameter of the flight circle and the beam spacing. No doubt there is an optimum ratio between beam spacing and flight circle diameter - it seems apparent that the flight circle should be tighter than the beam spacing if possible. In general, a tight circle is helpful for combatting drift in small sites and there is a good possibility that beam collisions can be more favorable also.

One caution - if the beams are open framework the model's rate of climb must be slow enough to assure that it doesn't climb above the lower edge of the beam between touches. If the climb is too fast there is danger of hanging the prop in the framework - almost an impossible retreiving situation unless you can reach the model with both hands.

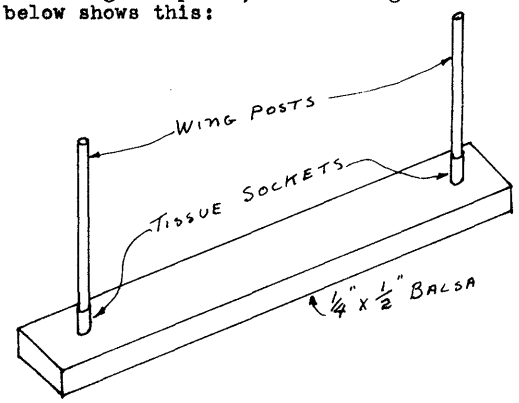




HINTS AND KINKS

Harlan Jig Follow-up

Last month this column presented the concept of wing bracing without a jig by supporting the wing in the center with the posts (glued to the work surface to keep prope alignment) and at the dihedral joints with wood scraps. Since I make a handling and storage jig for each wing, I hit upon the idea of anchoring the jig to the work surface, installing the posts, and bracing as before. The sketch below shows this:



In addition, Eric Greenwell points out that miniature clothespins (about 3/4" long, available at some "dime" stores) are ideal weights for tensioning bracing wires. He glues the wire at the starting point, strings the wire all around the wing and back to the starting point, hangs the clothespin on for proper tension, and glues the wire in place at all the other joints.

NEWS FROM AROUND THE WORLD

NEW YORK - YONKERS

Fred Weitzel discovered an Armory near his house and has been making use of it some. He and Ted Pfeiffer flew scale jobs one session, and Fred returned a couple of times with an autogyro. With luck, this may work into a regular flying site - which will be the first active site in the New York City area since the days of NIMAS East.

PENNSYLVANIA - PITTSBURGH

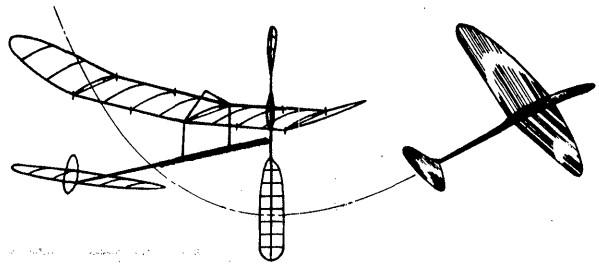
Ron Ganser, Norm Bickar and Ken Johnson put on a spell-binding indoor demonstration which won them a site for regular sessions. This happened last month as they met with the directors of the Soldiers and Sailors Memorial Hall, and their audience could hardly believe what they were seeing! This all goes to show that we should never go site-hunting without demonstration models. No one can really visualize an indoor model without seeing one, and no matter how much we protest to the contrary, people responsible for buildings can only picture a gas job smashing up their furniture!

TEXAS - FT. WORTH

Some relief for the lack of sites in this area came when Jesse Shepherd pinned down the General Dynamics recreation hall for monthly sessions. Some of these will be sanctioned, with the first session set for September 25, from 7:30 PM until 11 PM. Contact Jesse at 5312 Odessa, Ft. Worth, Texas, for more details.

The Voice of N.I.M.A.S. OCT·1964

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

JOHN MAROTTA, 7512 Jamaica Ave., Woodhaven, N.Y. 11421
L. A. WOOD, 3655 Tremont, Florissant, Missouri 63033
FRANK ZAIC, Box 135, Northridge, California 91326

AMA Election

The October issue of Model Aviation is scheduled to contain your AMA ballot, plus a list of the candidates and a brief resume of qualifications for each candidate. In past years most AMA members have been apathetic toward the election, to the extent that as few as ten ballots had been cast for all candidates for a given post. This is a deplorable state of affairs - but everyone knows all about that.

The upcoming election may well be one of the most important in some time, since we are choosing a new president at a time when we need a strong hand at the helm. We have by no means recovered entirely from the financial troubles of past years, and the Executive Council, guided by the president, is charged with controlling affairs and policies of AMA.

We have two candidates for president on this ballot - Gordon Gabbert of Dallas and Howard Johnson of Los Angeles. Both men have similar qualifications and experience in AMA affairs. To a certain extent, both men have similar platforms, and the choice will be difficult for many people - if they bother to vote.

Mr. Gabbert has singled out two particular jobs for himself if he is elected - jobs which must first be completed before AMA is back upon its feet. The first task is to get the AMA membership interested in AMA. Except for a hard core of about 5000 members, roughly 25% of our greatest membership, there is no interest beyond contest participation. We have close to 75% membership turnover, largely because of lack of membership interest. We must strive to create a pride of membership second to none.

Second, Mr. Gabbert feels we must create a useful purpose for our organization, since no club or organization ever survives long without a purpose. The selfish purpose of regulating model aviation (our only purpose at present) has not sustained us. Mr. Gabbert proposes that we could best serve in the field of youth aviation education. He says that aviation is becoming more and more removed from youth. No longer can youth visit the airport and see airplanes on the terms of before. Fences and guards keep them out of the area of danger and out of the way. No wonder they turn to other things. If we can accomplish these goals, we will have a growing membership and more juniors to keep the activity alive.

My vote will go for Gordon Gabbert in a very close decision. The important thing is: Will you use your ballot for either candidate, or do you care?

Special Warning!

Some time ago the suggestion was made to utilize a background which clearly contrasts with what you are working on - such as a dark background for a work surface to cut out ribs. I extended this idea to painting a model box black inside for ease of handling and for contrast for some pictures. Anyway, I used black enamel from an aerosol spray can and allowed it to dry. After three days, the fumes were still strong enough to affect microfilm. Imagine storing a taut film model and getting one back covered with baggy film! Happily, the effect was temporary. If you're looking for a way to undo a warped wing, this isn't it - but what a shock!

Postal Contests?

In times past there have been several challenges for postal contests issued - and no takers so far. Since it is now the season for a lot of sites to open up, here is a summary of the challenges:

Bill Graham challenged Bud Tenny in Easy B, B Stick, Indoor Stick and HLG; SMU Coliseum vs. Bill's 55' site. I may have to forfeit; SMU may no longer be available.

Lee Hines and Ken Happersett challenge any team in any category ceiling in HLG - they're lucky enough to be near good sites in all three categories.

The Ann Arbor Airfoilers hope to be able to challenge some Cat. I group in HLG, B Paper and Easy B.

Bud Tenny and Eric Vogel challenge any other two-man team in Easy B, Cat. I.

Send any answers to these challenges and any new challenges to Box 545, Richardson, Texas and I will pass them on to the interested parties.

Indoor Films

Joe Poloso carried his movie camera to Lakehurst for the last session it was open and took about 800 feet of 16 mm. film. He made an extra copy of the film and gave it to me - for which I am grateful. If there are any clubs who would like to view this film, contact me and it may be possible to work out a loan.

Dacron Samples

Just a reminder to anyone who would like to try some monofilament Dacron as bracing material: If you would like a free sample, send a stamped, self-addressed envelope to Box 545, Richardson, Texas, and I'll send you a sample. The same goes for those who have tried it and like it - have some more!

FAI INDOOR REPORT

From Ned Smith (via Curtis Janke's KOTDE journal) comes the thought that maybe international indoor competition ought to be limited to Cat. II sites. He cites the fact that Cardington is up for sale, Santa Ana has a door jammed open, and the Lakehurst hangars are currently unavailable as good reason to move to lower and more easily available sites. This sounds like a very worthy suggestion, since there are sites the world over which would permit development of top-notch Cat. II models. Curtis also observed that perhaps many potential entrants are discouraged at the thought of competing with teams who are already familiar with big hangars.

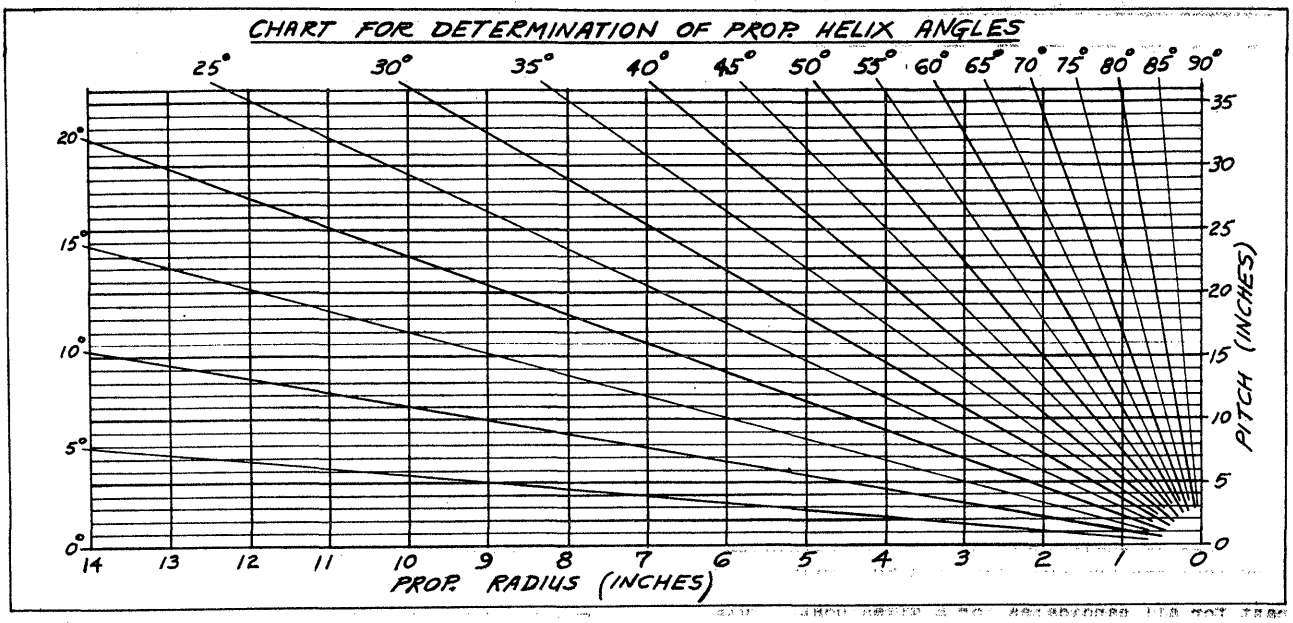
This is no doubt a good reason for some of the lack of indoor interest - many people automatically assume that a blimp hangar is the first requirement for flying indoor models, and won't even try low ceiling flying. It seems that this idea of limiting FAI Indoor to Cat. II sites should be given serious consideration - certainly nowhere in the U. S. except the coastal extremes can one conveniently fly in a blimp hangar. This can be said to be doubly true of the rest of the world - so why not give everyone a break?

A LOOK AT YESTERYEAR

Another addition to the indoor pusher quest: Steve Houlihan relates that Dave Copple flew an Easy B sized pusher at Wilmington two years ago. According to Steve, the model did very well, flying for 6 or 7 minutes. Any more recent pushers?

PROP FORUM

Last month's pitch checking jig prompted Charlie Sotich to send the chart below. The blade angles for all common pitches and diameters may be read easily from the chart, thus enabling you to check those older props to see if they are still what you think they are. The chart was drawn by Ray Wylie.



NEWS FROM AROUND THE WORLD

ENGLAND - CARDINGTON

Arthur Barr reported on a session held late in August at Cardington, and indicated that Indoor isn't dead in England - not yet, anyway. He gave no particular times, but indicated that most of the regulars and a few new fliers showed up. The tab for rental of the hangar was shared by the fliers, a collection from spectators, and the SMAE. It was decided to make the next session just one day so they could afford another session this year.

ILLINOIS - CHICAGO

The Chicago Aeronuts have not planned any sanctioned meets for October, but the Madison Street Armory is open almost every Saturday, and several fliers have been out sampling the air. Charlie Sotich is one of the regular fliers - he topped 25 minutes with his FAI in a recent session, while Tom Stone, a newcomer, was getting his first 20 minute flight. Pete Sotich says plans are being made to institute special events in contests this season to encourage junior participation.

INDIANA - KOKOMO

The Kokomo Aero Team has once again set up indoor contests at the Bunker Hill AFB, with this season's meets set for the third Sunday of each month from October thru April. The gym is open from 12 Noon to 6 PM, official flying from 12:30 PM to 5:30 PM. The events for October are HLG and Easy B, and the prizes will be engraved trophy plates as has been used so successfully before.

NEW YORK - YONKERS

Fred Weitzel has clarified the situation on the Armory near his house - it is available for use anytime weekdays in the daytime. The ceiling is 30' high with girders at 20', and Fred has done 3:02 with an autogyro and close to a minute with indoor scale jobs. So far, no one has flown any other events, but it seems sure that it is a good, usable site. If you're interested, contact Fred at 131½ Warburton Ave., Yonkers, N. Y. 10701

PENNSYLVANIA - PITTSBURGH

Ron Ganser's group in Pittsburgh will soon be using their new site about twice a month. It is the Soldiers and Sailors Memorial Hall in the Oakland district of Pittsburgh, with ceiling about 50' and floor area about 100' x 100'. To find out about these sessions, contact Ron at 2500 Mission St., Pittsburgh, 15203.

TEXAS - FT. WORTH

Jess Shepherd's session in the General Dynamics rec. hall was quite well attended. Miklos Bencze came the longest distance - about 100 miles, and all found very good conditions. Most of the models hadn't been flown since the Nats, so a considerable amount of re-trimming went on. Jim Clem finally topped the troops with 8:24 on his paper ship, followed by Jess with about 7½ minutes on his D Stick. No further sessions have been set up, because of a heavy basketball schedule.

HINTS AND KINKS

Balsa Repair Kit

Charlie Sotich solved the problem of safely carrying small strips of balsa to a contest for emergency repairs by storing the wood in brass or aluminum tubing.

Bracing Wire Tensioner

To insure equal tension in each panel of bracing wire on his models, Bob Champine loops the wire around a piece of balsa wood and applies tension to a set deflection of the wood strip. He then holds this set tension until the glue is dry and then moves to the next panel of wire.

Lightweight Wheel Hubs

Eric Vogel suggests that wheel hubs or axles for Class A ROG's and indoor scale models be made from grass stalks which are dried and cut into sections.

STATE OF THE ART

The model of the month, by Warren Williams, holds the Cat. II Cabin ROW record of 9:15.8 and the Cat. II B Cabin record of 13:01. Although the model is mostly conventional, "Willie" has the following to say about the floats: "I find the float secret is not in the design, but in the use of zinc stearate powder. Rub the powder on thoroughly and dust the floats with a powder puff before each flight."

TAUT FILM REPORT

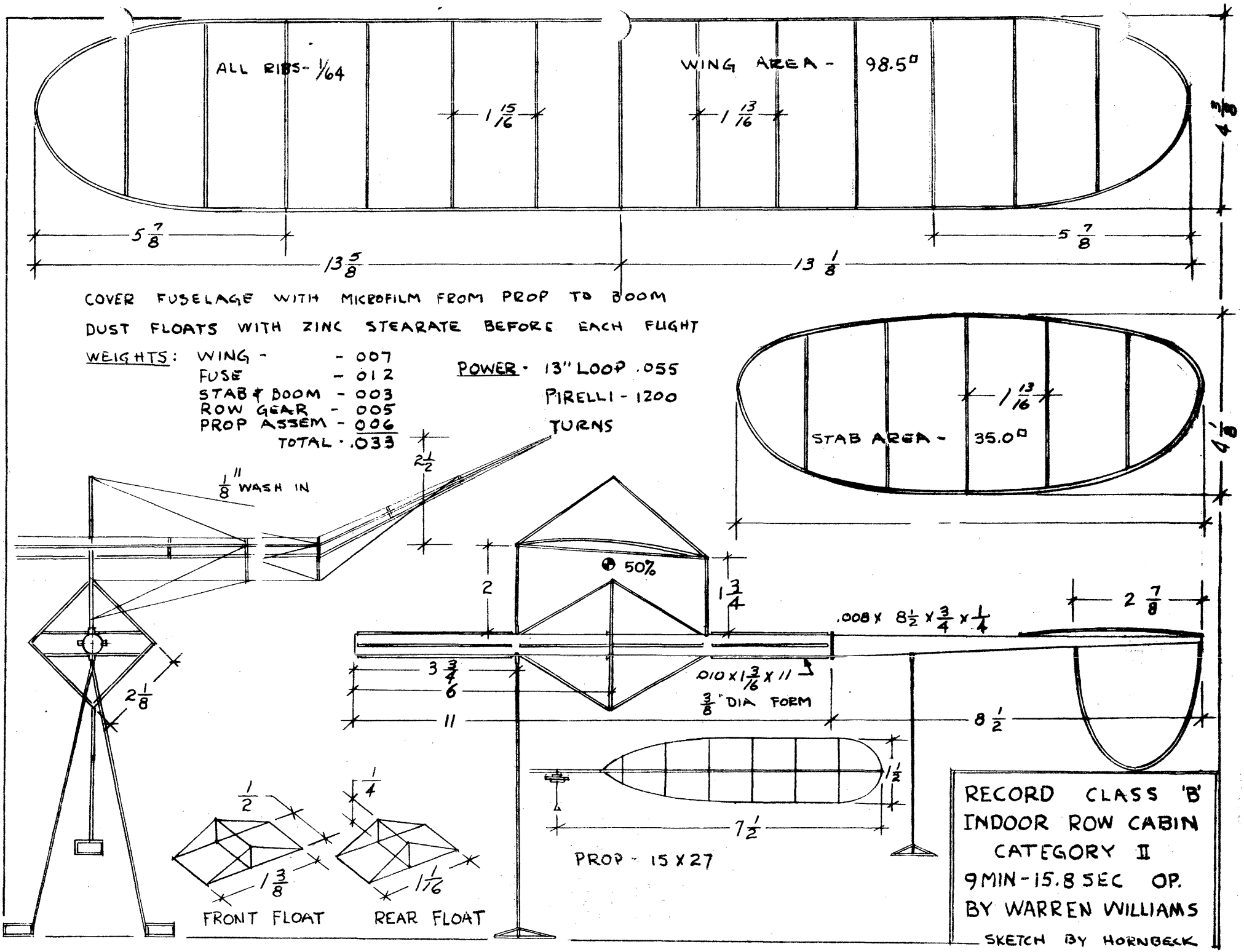
Part I - A Construction Method

A number of people have written asking how to make taut film models like the German team used to such good effect in the 1962 World Indoor Championships. I have tried to gather information from those using taut film, but without success. I offer the following information gleaned from correspondence, experience and recent experiments. If you can add to the following, please do.

It should be realized that "taut film" can be used to describe films which vary widely in tension. The loosest film in this category would be just snug enough to avoid a noticable change in camber between flight and rest; this film will not be wrinkle-free. The tightest practical "taut film" will put all members of the framework under tension and will contribute considerably to structural rigidity.

Of course, the tighter the film is, the thinner it must be to avoid warping and overstressing the framework, and the shrinking technique becomes more demanding and perilous as the film tension goes up.

If you settle for snug film which maintains your air-


ALL RIBS - 1/64
WING AREA - 98.5□
1 15/16
1 13/16
4 3/8
5 7/8
13 5/8
13 1/8
5 7/8
COVER FUSELAGE WITH MICROFILM FROM PROP TO BOOM
DUST FLOATS WITH ZINC STEARATE BEFORE EACH FLIGHT
WEIGHTS: WING - .007
FUSE - .012
STAB & BOOM - .003
ROW GEAR - .005
PROP ASSEM - .006
TOTAL - .033
POWER - 13" LOOP .055
PIRELLI - 1200
TURNS
1 13/16
STAB AREA - 35.0□
4 1/8
2 1/2
1/8" WASH IN
50%
2
1 3/4
.008 X 8 1/2 X 3/4 X 1/4
2 7/8
3 3/4
6
11
.010 X 1 3/16 X 11
3/8" DIA FORM
8 1/2
2 1/8
1 1/2
7 1/2
PROP - 15 X 27
1/2
1 3/8
1/4
1 1/16
FRONT FLOAT
REAR FLOAT
RECORD CLASS 'B'
INDOOR ROW CABIN
CATEGORY II
9 MIN - 15.8 SEC OP.
BY WARREN WILLIAMS
SKETCH BY HORNBECK

foil section without imposing high loads on the structure, the building and covering techniques will be simplified. I have produced snug film models in the past without really intending to, by using care in covering and by taking up slack spots with saliva brushed on top the film in the right places. The film used on these models was too thick to heat-shrink, so the airfoil was not uniform over the whole wing.

By now it is obvious that the thickness of film you use is important to get good results - the thinner the film is, the safer it is to apply the necessary heat to tighten the film. Up to a point, any film formula known to produce a stable sheet of film can be used. The sheet of film you plan to use should be uniform in color over the whole sheet and perfectly smooth (no wrinkles).

Purple to gold film can only be used if you intend to cover tightly and take up the excess slack with water or saliva brushed on top the film. Gold to hazy brown film can be heat-shrunk with care, after careful covering to eliminate as much slack as possible. Hazy brown to silver film is required for extensive shrinking and for elliptical dihedral models.

I'll assume that you have a sheet of film in the desired color range, made from a formula known to give a stable film after suitable aging. From this start I will describe the construction of a taut-film wing with the film tight enough to eliminate all sagging and most of the wrinkles. It will have conventional polyhedral to avoid the special construction techniques involved in elliptical dihedral construction. In fact, the only variation from normal practice will be the covering technique. It seems advisable to start with an elliptical planform, since other planforms require extra care with the wing tip areas.

I would suggest that you experiment with this technique on a wing of 70 to 100 square inches area - it can be especially disheartening to wreck an FAI wing from lack of experience with the heat source used to shrink the film. It can happen, and the only way to learn this technique is to practice. Make the tip outlines and outboard compression ribs a bit stiffer than usual on your practice wings - again to prevent ruining a wing with an over-active heat source.

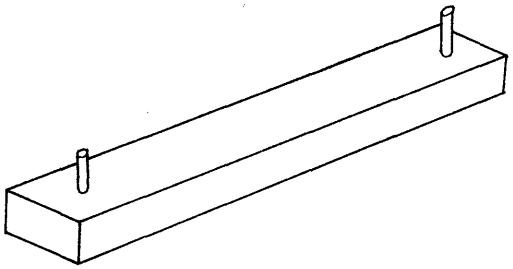
Only one extra gadget is used on the covering - a frame with aluminum ends like that suggested by Phil Hainer some time ago. Use 1/32" x 1/4" aluminum strips or 1/16" aluminum welding rod for small frames up to 25" long, and 1/4" x 1/2" balsa with the aluminum strips or 3/32" aluminum welding rod for the larger frames. Use epoxy cement to join the frames (see sketch below); make the frames at least 1" wider and 1" longer than the wing to be covered. Use regular hoops to lift and store the film and transfer the film to the covering hoop.

Now to begin covering. Transfer the film to the covering hoop, using saliva to stick the film to the aluminum and water or saliva on the wood. Note that the film goes on the flush side of the hoop as shown in the sketch above. Let the hoop dry half an hour, otherwise the film may bunch up along the wood sides as you slacken the film. Support the hoop film side up about 2" above the work surface, then carefully curve the aluminum ends so the hoop is concave on the film side. This slackens the film chordwise and curves it to fit the wing. Excess curvature will not matter, and may be beneficial. Place the wing on the film gently, remembering that rough surfaces on top the film may tear thin film. Use a small, very soft brush to apply water to the wing outline at the center rib. Now apply water alternately to short segments of the leading edge and trailing edge, working out to both tips from the center. Watch carefully to see that most of the slack is pulled out of the wing covering without deforming any of the ribs, and that the whole outline is wet down. Wet each rib, taking care not to push the ribs out of line.

Double-check to see that the entire frame is wet, then use kleenex to blot up any remaining drops of water. Place the hoop film side down over a large smooth work surface (corregated cardboard is O.K.), trim the wing loose and pin it down to dry overnight.

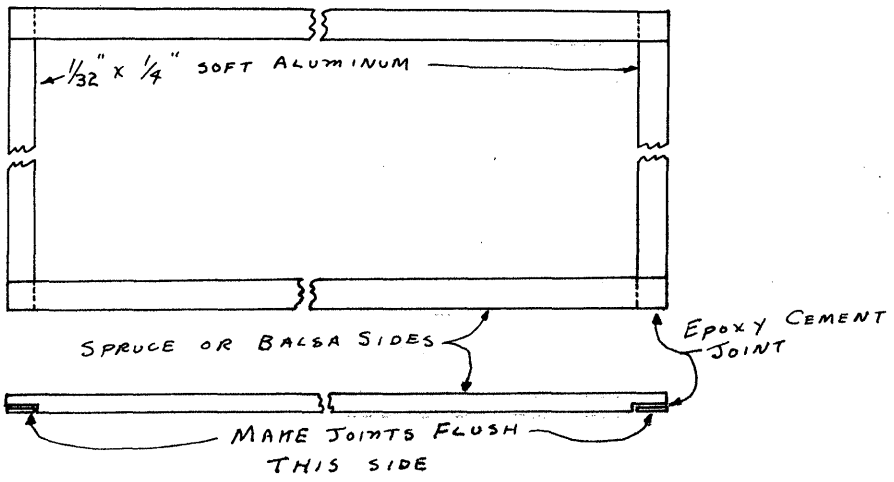
After the wing is dry examine the covering. There probably will be many tiny span-wise wrinkles; ignore all but any large areas of slack film. Use a heat lamp to shrink these - but be careful. Use dark glasses to avoid back glare and reflections, and watch carefully for the film to start shrinking. Remove the heat as soon as the film starts shrinking, then bring it back if it wasn't enough. I use a small variable transformer and a 150 watt heat lamp to get better heat control.

Install the center dihedral, then run the brush wet with saliva along the center rib to remove the resulting slack film. Now install the wing posts (on your bracing jig or by the Harlan method), cabane, and primary bracing. Install the tip dihedral and remove the slack from the film with the brush and saliva. Install the tip bracing and secondary bracing (if needed), double-check the wing for alignment, and mount the wing in a handling jig like that shown below.

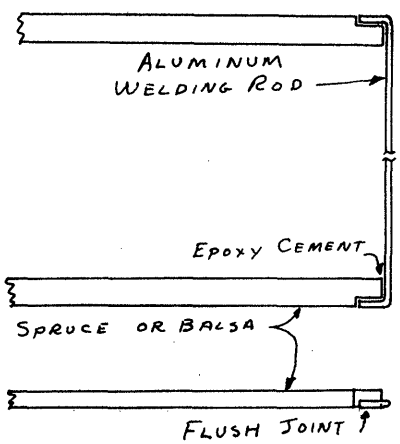


Inspect the film for slack spots. If the film is heavier than gold, heat-shrink at your own risk. The brush and saliva will probably clear up a lot of small wrinkles, especially along the edges of the framework. If you're going to shrink, mount the handling jig so the wing projects out over the edge of the table, arranged so the wing is about 6" below eye level and between you and the room lighting.

The best heat source I've found for this operation is a 40 watt Ungar or Sidco soldering iron plugged into a variable transformer. 85 to 90 volts AC input seems to be about the best setting. I hold the iron about 6" below the area to be tightened, tip vertical and pointed toward the slack. By working very carefully, most of the wrinkles can be removed. Take it easy, working over the worst areas first, and remove the iron as soon as the film starts to shrink. Repeat the process for the other wing - and good luck. Next month: Some discussion of film formulas and of pouring and handling techniques.



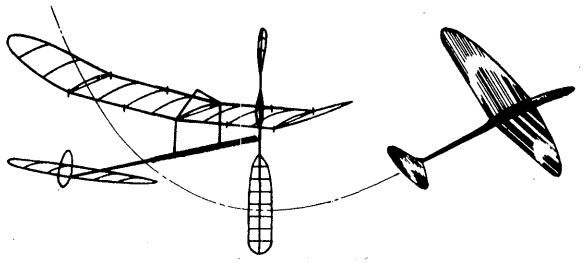
COVERING HOOP - PHIL HAINER



COVERING HOOP - JIM CLEM

The Voice of N.I.M.A.S. NOV · 1964

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

GEORGE BUCIC, JR., 10146 S. Rhodes Ave. Chicago 28. Ill.
BOB HANFORD, 4318 N. Frankfort, Tulsa, Oklahoma
THOMAS F. STONE, Box 78, RR #5, Rockford, Illinois

AMA Election

By the time you read this, it will be almost too late to mail your AMA Ballot to Headquarters. The presidential election is quite important this year, and half the AMA Districts are electing officers this year also. If you aren't concerned with who holds the offices in your District, you have never handled any AMA business. If you ever need to transact any business, from some kind of complaint to a rules change or similar business, you need officers who take their duties seriously. Inform yourself and vote - now! Deadline - postmark before November 15, 1964!

Financial Report

The third anniversary of INDOOR NEWS AND VIEWS finds us slightly in the black for the first time. This was made possible by an increase in circulation to almost 200 issues, coupled with a close watch on printing costs and quantity and discount purchases of office supplies. The costs break down as follows: Printing - $203.26; INAV postage - $139.82; postage for correspondence - $55.23; office supplies - approximately $24; Total - $430. The income totalled to $453.95, leaving $23.95 surplus. This compares to $25+ deficit in 1963 and about $90 in 1962.

Incoming mail added up to 635 pieces and I sent out 777 letters during the same period. Some of you aren't answering your mail!

However, many of you are answering your mail - and many of you are going out of your way to help out and to furnish material even without being asked. I am deeply grateful for all the help and cooperation you all have given - without this, INAV would be a mighty poor paper!

NIMAS Services

In the past a few of you have written asking for the names and addresses of NIMAS members and indoor fliers in your state or city. If enough of you indicate a need, a compilation of the membership can be made available. If you would like such a list, drop a line and let me know.

Some time ago a survey of active sites in the U. S. was started on an informal basis - and now it seems that it is time to put the survey on a more active basis. A site survey form will soon be available to record this information; with your cooperation the results will be put into a site directory to be made available to all who want one. If you travel - you could take your models and the site directory and join others in their own site.

Need A Club Library?

Many model clubs are lucky enough to have a permanent meeting place with storage area. If your club is one of these, have you considered setting up a club library? If club members have a ready access to a variety of information and ideas, the whole club will benefit in bigger and better models and improved performance.

Start building the library with subscriptions to each of the model magazines and any specialty newsletters that cover interests of the group and mix in full size plans published by various plan services. Add as many Zaic Yearbooks and back issues of model magazines as you can beg, borrow or otherwise obtain - and there you have a good start at a comprehensive library. In no time other items will be added to the library and it will soon be a reference source tailored to your group.

Sponsored Junior Memberships

All clubs, NIMAS members and AMA Leader Members are reminded that sponsored NIMAS memberships for Juniors are available - full voting NIMAS membership (one year only) for $1 cost to the Junior. Write Bud Tenny, Box 545, Richardson, Texas, for details.

Back Issues?

There are still a few complete sets of back issues dating from January 1963 which are available to NIMAS members - but with a new price. The total number of issues have accumulated until it requires 40¢ postage to mail them - so send 40¢ to get your set; stamps preferably, please. Price to subscribers still 10¢ per issue.

FAI Is In!

The Oct. '64 MODEL AVIATION announced that FAI Indoor has been added to the list of indoor events, effective November 1, 1964. By the time you read this, three new records may have been set at the SHOC Indoor RT at Santa Ana on Nov. 8.

FAI INDOOR REPORT

Just before our deadline, a memo came from Bob Champine on the subject of the CIAM Agenda for Nov. 20-21. The following quotes are "lifted" from the memo, since it dealt with outdoor FF also:

"The time for the CIAM-FAI Paris meeting is now only two weeks away and even though I have suggestions from only the USA, Austria and Deutscher Aero Clubs, you 'interested' AMA FAI'ers should get the last word on the various proposed agenda items.

Please - please reply immediately if you want me to know your reaction, and I'll press for the majority viewpoint at the various meetings.

USA Agenda Items - Indoor

No change to span rule.
Is 1964 Indoor Championships Cancellation permanent?
Discuss addition of ceiling category records as per AMA Rules.

GERMANY Agenda Items

Propose change in bi-annual rhythm of Championships to:
1st year - FF and Control line
2nd year - RC and Indoor
World Champions be allowed to compete next time to defend title and be independent of new team.

This is about it for FF/Indoor - any other suggestions will be welcomed, but it is pretty late to do anything but discuss new items at the various 'informal' meetings. Only agenda items will be officially covered (so I'm told) at CIAM.

Sorry this covers only three countries, but this is all that's available!"

O.K., fellows! Hop to it! Send your comments and reactions to Bob immediately - his address is 25 Beechwood Dr., Yorktown, Virginia. Don't assume that he knows that you like things as they are - if you don't tell him otherwise, all he will know for sure is that you don't care enough to express your views!

SUGGESTIONS WANTED

In recent months INAV added a new column to the many regular and occasional features: A LOOK AT YESTERYEAR. The reader response and contributions to this feature assure that it will continue - but what about many of the other columns?

It has been my practice to try to fill a need when one shows up, and so seven of the sixteen columns now regularly included were suggested by readers or the idea for the column came from comments made by a reader.

Therefore, if we're missing something you feel ought to be included, sound off! In particular, suggestions on the following columns are desired:

QUESTIONS AND ANSWERS - Have you any questions on techniques or materials or design which bother you? No question, asked sincerely, is too "simple" or "silly" to be dealt with.

RECORDS? MAYBE! - Should this one be kept? It was set up when MODEL AVIATION was publishing record listings semi-annually only; at present the list is brought up to date monthly. The advantage to the INAV listing is that you hear about five weeks sooner. If you are flying in a record trials, this can prevent you from applying for a record with a time which exceeds the former record and is still less than a new mark made three weeks prior to your flight. If this column is retained, fliers and CD's alike will have to make the times available to insure a complete listing.

THE LAB - This one was set up hoping to stir up interest in the proposed NIMAS measurment and testing standard procedures, but no one seems to care whether Indoor remains in its "cut and try" status or not.

INDOOR FLYING SCALE - This feature was requested by a few readers, but most of the available material is sent to other newsletters. Consequently, our info is mostly secondhand and scarce.

So there it is - what do you want? Let me know what you think - if the info is available, I'll try to run it.

GET THOSE SITES!

No matter what type of models we fly, we sooner or later must face the problem of where to fly them. As the world population keeps expanding, the wide open spaces for free flight models and the more limited space needed for RC and U/C (especially ones where the noise is not rated as objectionable) are harder and harder to find. Indoor fliers are lucky in one respect - the models are not noisy, create no mess except for the litter of cigarette butts, coke bottles and trash which thoughtless fliers leave around, and are essentially incapable of damaging anything except themselves.

In spite of the advantages indoor models have in the matter of litter, noise and site damage, we nearly always have a shortage of sites to fly in. Then, because there is no place to fly the models, few people will build an indoor model and store it for months on end hoping that a site will open up. Sometimes this develops into a vicious circle - especially when city recreation facilities are used. The city employees must consider the group with the greatest demand, especially when very many people use the building. So, you can't use the site if you have a small group, and your group is small because there is no active site to encourage activity!

However, it seems that even serious indoor fliers tend to disdain the use of sites that are less than perfect. The ideal site would have a 200' (or higher) clear ceiling, zero drift, and acres of floor area - so what! Two years ago Charlie Sotich set a Cat. I D Stick record of 15:20 in a 22' room which had very small floor area. Thus, it turns out that the only really essential thing for an active site is low drift - but the smaller the floor area, the lower the drift must be for long flights to be achieved.

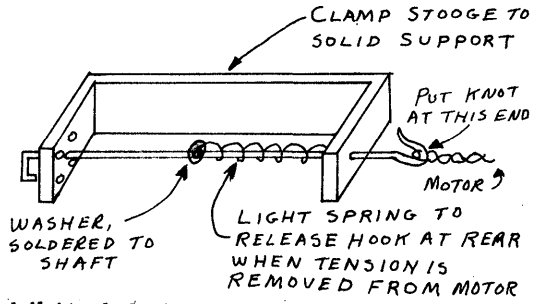
Just for once, look for sites while you THINK SMALL. It isn't necessary to locate the smallest site, but don't reject a site just because it is small. Rather, try each site (if you can get in) and evaluate the air conditions. The highest site may not be the best. For example, a church fellowship hall with 14' ceiling and 35' x 55' floor area has enabled me to make flights in excess of 7 minutes, while a 30' aircraft hangar with 60' x 70' floor was unbearably turbulent late one night, even though the air outside was calm enough to fly indoor gliders under the street lights. Three ships were flown - a small B stick, a paper stick and an Easy B. The Easy B topped them all by getting 4:41 on a very lucky flight, while the others were buffetted and driven to the walls.

Now that you know what to look for, be prepared to contact those responsible for the site by making a personal visit. Take along a demonstration model, one which will turn tightly enough to fly in an office, since this may be the best and only chance you will have. Know well in advance if the site floor has a special finish, and be prepared to tell him in advance that your group will wear special shoes or go in stocking feet. Try to avoid sites which have no windows unless you are prepared to pay for electricity to light the place - you just don't have a case if it will cost them money for you to use the site! Be sure to point out that they won't have to heat or cool the place - you can't stand the blowers running! Go to it, and good luck!

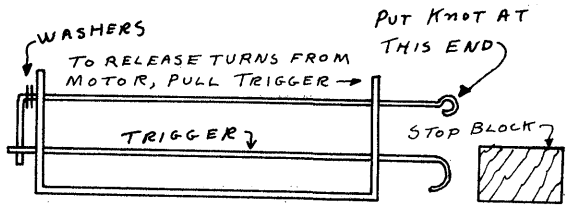
HINTS AND KINKS

Two More Winding Gadgets

By the time Charlie Sotich's winding gadget got into print (June '64), he reported a modification by Pat Laughton of Waukegan. This modification, shown below, makes the device completely automatic in operation. To use it, anchor the "stooge" to some solid object, hook the knot end of your motor over the stooge hook, engage the other end in one of the locking holes, and wind the motor as desired. Disengage the motor from the winder and hook that end to the prop shaft (while holding the model in your left hand). Grasp the motor near the hook of the stooge and release the tension on the stooge - the spring (get one from a worn out ball-point pen) will disengage the stooge hook and permit the few turns to run out - thus giving a loop to hook to the model easily.



Fred Weitzel devised the second modification, which has the advantage of requiring no solder for assembly. This one is used the same way, except the trigger is pulled to release the "back off" turns. This gadget, in common with Charlie's original, can be used to count the left over turns after the flight, where Pat's model might release a few turns when the spring tension overcame the tension of the few remaining turns.



NEWS FROM AROUND THE WORLD

CALIFORNIA - VISALIA

Don Farnsworth reports via the INFORMER that the Visalia Sky Kings will hold their first indoor meet of the season at Mt. Whitney Gym on Nov. 14 from Noon to 6 PM. HLG only, spans restricted to 9", entry fee 50¢, awards for Jr. class and Sr.-Op. class. He had a (?) after the date, so contact Don at 301 Carl Dr., Viaslia, for more info and confirmation of the date.

ILLINOIS - CHICAGO

Pete Sotich passes on the info that indoor contests will be scheduled on the last Saturday of each month, but the first date hasn't been firmed up yet. Pete says the emphasis will be placed on Juniors and pre-Juniors when the contests are planned. Contact Pete at 3851 West 62nd Place, Chicago, 60629 for more info.

NEW YORK - YONKERS

Fred Weitzel has now arranged for the Armory he uses to be open from 5 PM to 7 PM on Wednesday evenings. From all reports this site is one with very low drift - so it should be possible to make pretty long flights in there in spite of a fairly cluttered ceiling. Drop Fred a line at 131½ Warburton Ave., Yonkers, N.Y., 10701.

TAUT FILM REPORT

Part II - Notes on Microfilm

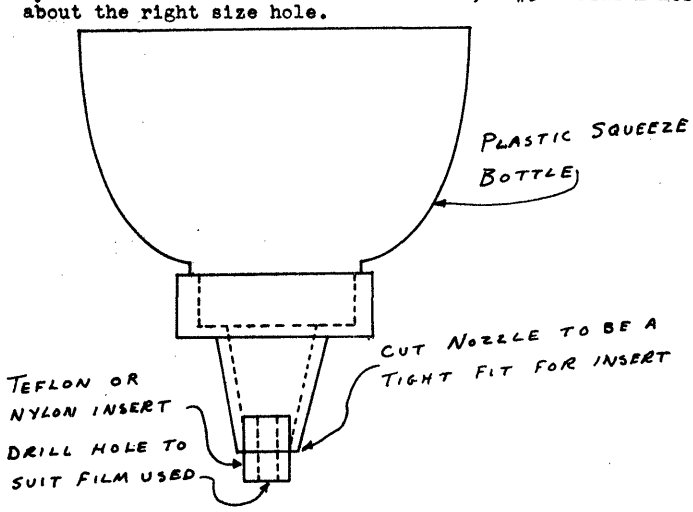
The following comments come from personal experience and conjecture, and may disagree with pet theories and experiences of some readers. If so, please feel free to expound on your own methods and ideas.

As I said in Part I, microfilm that is used for taut covering must be dimensionally stable after proper aging. It should also be strong in thin sheets, or it will be impossible to lift. The ideal film will also be reasonably "dry" (little tendency to stick together); will form thin sheets easily (which may also be a matter of technique and experience); and will stabilize fairly quickly on the water without wrinkling.

Quite frankly, I have no idea how to formulate the "ideal" film. I can offer a formula which is still in the experimental state, but it seems to meet many of the above requirements. I produced it experimentally without really knowing what I was doing, but with good results. The base, chosen because it is a uniform, easily located material, is Duco Household Cement. After trying various thinners and plasticizers, I settled on the mixture of thinners and the plasticizer mentioned by Joe Bilgri in his "Intruder" article (July-August '64 FLYING MODELS).

The film formula is this: Mix two parts Methyl Ethyl Keytone, two parts Butyl Acetate and one part Amyl Acetate; use three parts of this mixture to thin one part Duco Cement and add two or three drops of Butyl Phthalate for each ounce of solution. I have no models older than three months which have been covered with this film, so the long-term aging stability is not settled, but it has worked out very well so far.

Forming the sheets of film is largely a matter of standard practice and lots of experience with the film you are using. Use a tank which is large compared to the hoop, fill it with clean water to about 1/4" depth and allow it to come to room temperature, and make sure the tank is not located in a draft. Use some pouring method which gives a uniform flow; my favorite is the pouring spout shown below. The orifice is removable for cleaning and to change orifice size - make it from teflon or nylon rod. For the film formula above, a #38 drill makes about the right size hole.



After pouring and lifting the sheet, let it dry off enough to determine the color. Discard any sheets which are heavier than gold to purple or have wide variations in color, and reject any which have large wrinkle areas. Minor wrinkles may settle out after aging, or you may elect to heat-shrink these wrinkles on the hoop. The ideal sheet will be uniform in color, gold or thinner, and perfectly smooth on the hoop. Age the sheet for at least two weeks to be on the safe side, and apply it to the model as outlined in Part I (Oct. '64 INAV).

I have ignored at least one variable in this article, and that is settling time on the water. Some films don't wrinkle appreciably after pouring - they just lie there. This type of film might show better stability or different characteristics if it is allowed to age some on the water before it is lifted. Even those films which do wrinkle quickly show different amounts of tension on the hoop when you vary the length of time on the water before placing the hoop on the film. Good luck, and if you have problems I'll try to help. If you disagree with the way I do it, let's get together - we both may learn something.

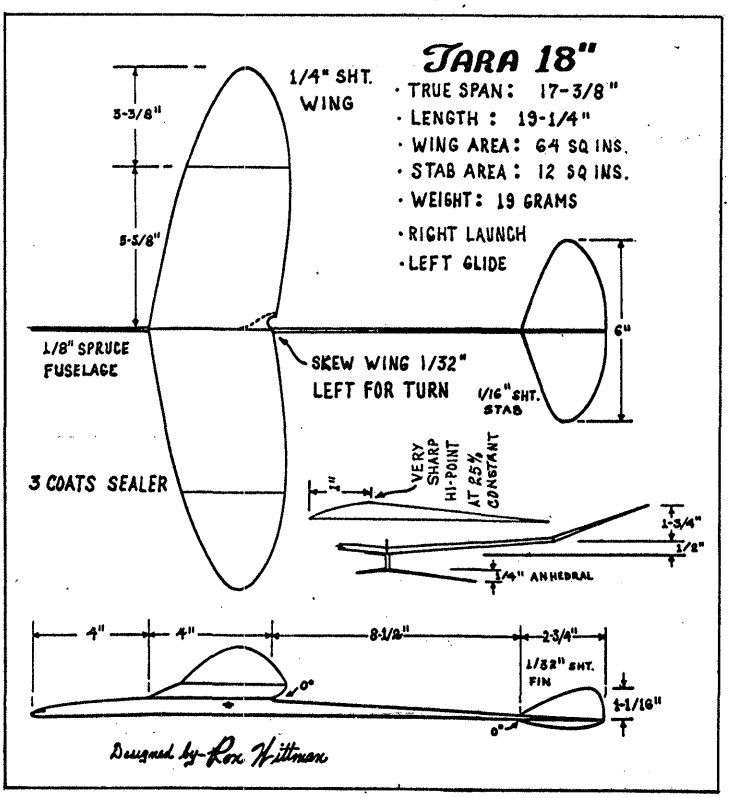
A LOOK AT YESTERYEAR

Justin Murray once mentioned being disqualified for using a rolled motor tube on a Baby R.O.G., commenting that this was the first rolled tube that anyone in that part of the country had seen. I asked him to elaborate, and this was his reply:

"Whether the rolled fuselage is my invention or not, I, of course, cannot say. Someone, somewhere, in some other part of the country may very well have had the same idea, but it was the first ever seen in the Minneapolis area. I was promptly disqualified after winning a contest in the West High Gym, with the time of one minute and fifty something seconds. The closest competitor had turned in the time of about forty-five seconds. The contest was advertised as competition between "flying stick planes" not to exceed the span of twelve inches, and the judges declared I had no damn business trying to pull the wool over their eyes with a tubular fuselage which enclosed a motor that could be stretched out two feet and cranked with an egg beater!

Perhaps they were correct in their action, but in this case I think I should have been disqualified when all jobs were examined for the twelve inch wing span rule, before the contest got under way. This took place in the spring of 1928. I was also disqualified for the same reasons that same summer in Fargo, N.D.(where my family usually spent their summers), after making the unheard of time of 2:22.3. I was so delighted with my ship's performance that I forgot the disappointment of not winning. Indeed, for its vintage, this 12" span job was a little jewel and had several innovations: all balsa split-axle landing gear and wheels, attached to the fuselage with short (about 1/4") pieces of very light and springy jeweler's wire to take up shock, making the chance of fracture upon contact virtually impossible. The original "Baby" had a bamboo and wire landing gear with hard fiber wheels and weighed a comparative ton. Old "Two-Twenty-Two" as we called it, also sported the first sheet balsa prop I had ever seen, which was quite high pitched, of larger diameter and very effective. The motor was a single strand of 1/8" flat rubber, with tiny loops at either end, bound with silk thread and lubed with saliva!

The prop and rolled fuselage I made by sanding a 1/8" sheet down to about 1/32", a terrible task, as the thickness had to be perfectly true or it would crack when rolled. I used to boil it first! I don't think 1/32" sheet balsa was available until the early 30's."



DESIGN FOOTNOTES

The Built-Up Tail Boom

Several months ago Lew Gitlow wrote of a really light FAI ship he had built, one which turned 39 minutes plus with room to spare in Santa Ana. Aside from Lew's normal light construction (total wt. .034 oz. for 210 sq.in. wing), the model also had a 16" tail boom which weighed just over .002 oz. The ultra-light boom was achieved by building it from .020" square balsa strips and bracing it with karma wire. At the time, Lew commented "It did not work out well - I'll go back to a tube." In my reply I observed that there couldn't have been too much wrong with the boom if the model did 39 under the catwalk!

After this idea had time to kick around in my skull for a while, I wondered if the built-up boom could be perfected with a different design goal. Rather than shooting for light weight as Lew had done, I decided to aim for a boom with better than normal structural efficiency and no more weight than a rolled boom. That is, the new boom should be stronger in both torsion loads and bending loads.

My first booms were like the line sketch in figure I, with the crossed diagonal bracing made of monofilament dacron. The weight saving was about 40% over that of a similar length rolled boom and the bending strength was vastly superior. Torsional strength was adequate for flight loads (except for rough air) but rather "loose" for normal ground handling (maybe I'm just clumsy?) and for minor turbulence caused by people walking by. The boom design shown in figure II turned up with even better bending strength and entirely satisfactory torsional strength, with weight about 5% less than a rolled boom. Several bracing schemes are possible, but untried. A final version might well save about 20% in weight with strength superior to a rolled boom.

Some final comments: Adequate bracing strength for the design in figure I is hairy - the individual strands must be tight, and this is hard to do any way I've tried so far. The building time is about 3 hours. The second design is easy to build in about 1½ hours. Both designs are built as a crutch over a top view, with the cross pieces glued on top the crutch and trimmed to length with fingernail clippers after the glue is dry. The completed crutch is inverted and short uprights are glued at "X" and "Y" to support the third longeron while the other cross pieces are added. The diagonals in design II are cut to fit, using dividers to measure the proper length Besides the above mentioned advantages, built-up booms require less delicate work (except for bracing design I) and do not use scarce choice wood such as rolled booms must have to achieve competitive weight. Also, there is no glue seam to pull the boom out of shape.

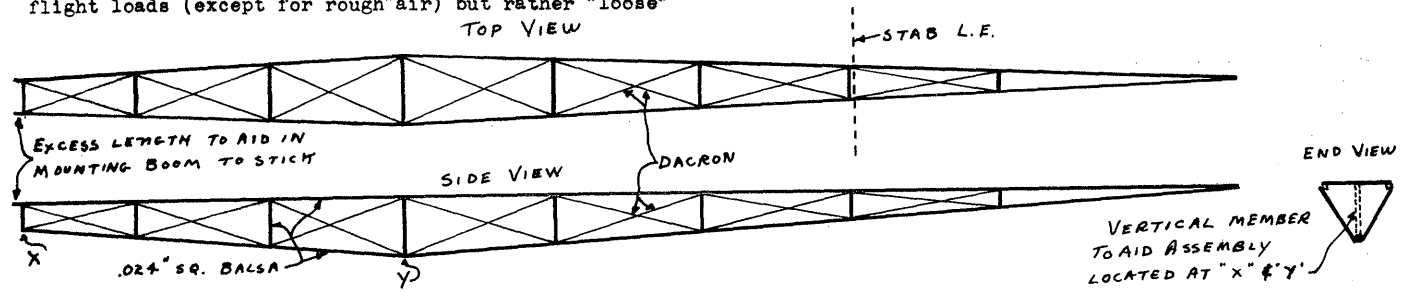


FIGURE I

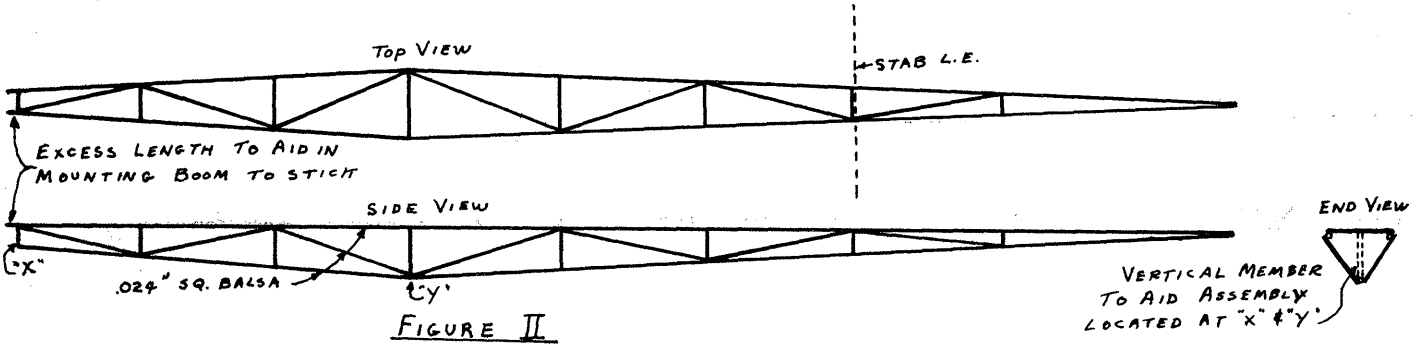


FIGURE II

LOW POWER REVISITED!

In the article "Low Power Models - Trick or Treat?" I ran a formula labelled "Efficiency." Charlie Sotich adroitly pointed out that solving for Time showed that for a given model weight and ceiling height, increased duration could be gained by using more rubber:

$$\text{Time} = \frac{(\text{Efficiency})(\text{rubber wt.})(\text{ceiling height})}{\text{Model wt.}}$$

While this statement is true, we all know that many compromises must be made to use a large motor under low ceilings. Since this is the technique I hope to replace, I guess I pulled a boo-boo!

To top off my chastisement, Larry Renger pointed out that all "Efficiency" numbers are pure numbers - not a unit in a car-load. Since mine had units expressed as minutes/ft. of altitude, it doesn't really qualify! So, maybe the matter of an efficiency formula will be left to develop later.

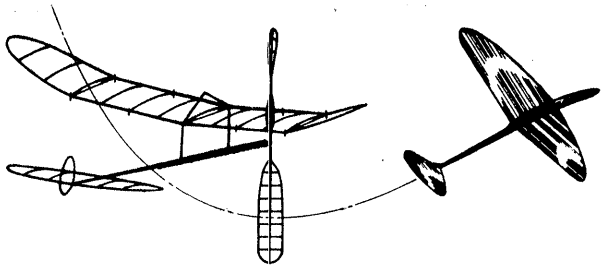
In the meantime, there have been few flights made with low power set-ups. Of those people willing to make flight tests, most of them have been swamped with other projects or else they have not had a site available. In the line of flight tests, a real need exists to make very low power flights under carefully controlled conditions. By this I mean that prop-power set-ups should be chosen so that the model deadsticks right at the floor, yet will not reach the ceiling with full turns. Careful logging of dozens of such flights will furnish data for evaluating the low power approach.

It should be noted that such low power test flights would not be competitive in nature unless the site had an exceptionally rough ceiling which aborted most of the flights which touch the top. The fact remains that if all the models competing have similar cruise characteristics, the winner will be that model which spends the most time battering the ceiling.

The major expected advantage with the low power model is a vastly improved cruise condition due to the lower flying weight of the model. Careful observation of low power models in the cruise seems to reveal that the rate of sink is vastly improved over that which has come to be expected from conventional set-ups. This can't be proven without exhaustive and detailed flight analysis - and such flight analysis would require the close cooperation of several fliers and frequent access to a site which has good conditions. This currently isn't available, to my knowledge at least.

The Voice of N.I.M.A.S. DEC·1964

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

RAY COMBS, RR#1, Box 712, Morrison, Colorado
GEORGE D. MARSHALL, 7208 G St., Seat Pleasant, Md. 20027
ALAN RICHES, 1911 London St., New Westminster, B.C., Can.

A Helping Hand, Please

With the addition of Alan Riches to our roster of NIMAS members, we have contact with another section of Canada. He is a member of the Vancouver Gas Model Club, a well known free flight club. They are starting indoor activity, and Alan makes this request: "We would like to make contact with clubs in the Northwestern states, and if you could put us in contact with anyone this would be greatly appreciated." So, hop to it, fellows!

A Thesis By Hacklinger

During the time Max Hacklinger was preparing for the '62 Indoor World Champs, he also did extensive research and prepared a report. This was translated into English and published in the November 1964 JOURNAL OF THE ROYAL AERONAUTICAL SOCIETY. Thanks to the Society, and to Ron Moulton (Editor of AEROMODELLER), who furnished a copy of this thesis to NIMAS, it can be made available to those who wish to read it.

The title of the thesis is "Theoretical and Experimental Investigation of Indoor Flying Models" and it is a quite complete treatment of the subject. From time to time, portions of this report will be used in INDOOR NEWS as space permits, but it is too long and complex to be completely reproduced here. Therefore, either photocopy reprints or offset reprints will be made available at cost to those who want them. Please order these within the next month or so - whatever reprint method is used it will be cheaper in quantity rather than as several small orders. The price will depend upon how many are printed and I will choose the best method.

Spread The Word!

Some time back I described an indoor display made for a conference in the area and suggested that a similar display could be put in hobby shops with a listing of telephone numbers and addresses for inquiring modelers to contact. This approach will work in starting more people to thinking about indoor - witness the active and able group started by Jim Mayes in Elmira, New York, with similar displays in his school.

This past week I was asked to give a program about indoor before the local Kiwanis club. I gave a brief bit of history, passed around samples of wood, microfilm and bracing materials, and flew an Easy B and a B Stick. The group was well entertained and amazed by what they saw, and they asked many questions. I may be no nearer to a local site than I was, but this group of about 35 men now know that such things exist!

Left-Overs

In the past, several items of NIMAS business have been brought up and discussed. Some of these have gone forward to be accepted, but others have stagnated from lack of concrete action by the membership, in spite of general approval of the idea. Suggestions and comments on these items are desired:

Sponsored Junior Memberships: A fund has been set up by donations from NIMAS members to be used to encourage Juniors to join NIMAS and to be more active in indoor. Briefly, the requirements for Sponsored membership are:

1. The Junior will be nominated by an AMA Charter Club or Chapter, or by a NIMAS member.
2. The nominee furnishes a brief commentary on his model building experience and pays $1 - the fund furnishes $2 to pay the remainder of membership cost.
3. The club or person who nominated the Junior notifies NIMAS, and we will contact the nominee.

NIMAS Awards: This idea started with the concept of an incentive award for performance which did not exceed the existing record but was better than average flying. For example, 14 out of 35 existing Cat. I records are over two years old, and 7 of these are three years old or older. These records are magnificent marks, and if we do 14 minutes in C Stick, we miss the record by only 9 seconds. It is still an excellent flight - and goes without reward or mention. For that matter, Cat. I times over 10 minutes are rare, and flights as long as 12½ minutes are almost non-existent. I could say more, but the point is clear. The following times have been suggested as goals for NIMAS Awards:

Indoor Stick

Award	Cat. I	Cat. II	Cat. III
Silver	10:00	20:00	28:00
Gold	12:30	25:00	35:00
Diamond	15:00	30:00	42:00

Indoor HLG

Award	Cat. I	Cat. II	Cat. III
Silver	0:24	0:45	0:55
Gold	0:30	0:55	1:05
Diamond	0:36	1:05	1:15

AMA Election

Our congratulations and best wishes to Howard Johnson in his new post as President of AMA. This post is a very important one, and Howard's past record indicates that he is a hard and conscientious worker - he will undoubtedly do a good job for us.

INDOOR RULES

Contest Board Action

FFCB Chairman Phil Klintworth called for final vote on the IHLG Scoring rules proposal, with a deadline of Dec. 15 to enable the rule to be included in the 1965 Rule Book if it passes. If it does not pass, this proposal will be dead. The proposal reads thus:

Change paragraph 10.9 under Section 10 (Indoor Hand Launched Gliders) to read as follows:

Scoring of Flights: Scoring time shall be the total elapsed time of the best two of not more than nine official flights. Flight duration shall be scored to the nearest one-fifth second.

RECORDS? MAYBE!

ST. EDWARD'S HIGH SCHOOL RECORD TRIALS - November 1964
CAT. I, St. Edward's High School Gym, 33' ceiling
Open C Cabin - 9:15, Ron Ganser
Open Autogyro - 3:01, Ken Johnson

TAUT FILM COMMENTS

Pat Green of Detroit and Duncan McRae of Winnipeg, Canada, report successful taut film models which have used film which was blue. Both indicate that the sheet must be uniform in thickness and no heavier than blue anywhere on the sheet. Bear in mind, however, that the heavier sheets should be reserved for the wing - for two good reasons. First, small sheets of very light film are easier to pick up than large light sheets; second, the wing is able to withstand the pull of heavier film.

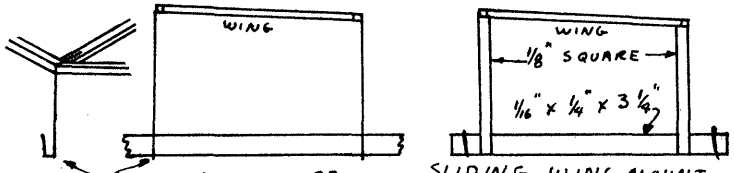
LET'S HAVE MORE FLIERS

Although the terminology grates on the feelings of the dedicated indoor flier, it is "indoor season" again. (As both a dedicated indoor flier and a person who is acutely uncomfortable in temperatures below 60°, I have never understood why indoor models must be flown in the winter only - the temperature in the average site spoils all the fun). Anyway, back to the subject - it is indoor season and now is the time to expand our ranks as much as possible. For the long range good of our hobby, we need to attract as many Juniors and Seniors as possible, but don't overlook the possibility of attracting people who fly other kinds of models, no matter what age the modeler happens to be.

Our hobby has the undeserved reputation of being a highly specialized "for experts only" type of thing, and it is this "image" we must overcome. This idea no doubt comes from consideration of some of our more specialized techniques, plus the many stories in past years about the highly exclusive "30 minute club" and the general tone of many articles which expanded further the "experts only" idea. Anyone who has worked to recruit new fliers for indoor has come up against the idea - expressed thus: "I don't see how you have the patience!" or "I couldn't possibly build one of those!"

In reality, indoor makes the ideal place for beginners to start, strange as that may seem to some outdoor modelers. Certainly, the average person shouldn't start with a full house FAI, but there are many fun events which make excellent projects and teach many skills we use in indoor. Many of the most enjoyable sessions I've had were with oddball fun models. One session involved HLG in an 8' ceiling, with models limited to 4" span. The session kept the whole club busy from about 7 PM to about 2 AM, and everyone gleefully chased tenths of seconds and sanded outdoor balsa to less that .01" thick for tail surfaces. Another time a whole club turned out with Parlor Mites for an absorbing and enjoyable evening.

The list of fun models is long, but some of them are familiar. The Easy B is a well known approach, and perhaps the most complex one from the beginner standpoint. The microfilm glider, rightfully scorned by contest men, is the ideal project to get people used to being around microfilm. In some cases microfilm or condenser paper covered tow line gliders can be used to teach indoor building techniques with the extra bonus of a rousing good time. The Jetco ROG makes a good beginner project, since the stock kit can be built even by very young Juniors. A whole series of fun sessions can be based on this one design - start with stock kits, graduate to lighter wood and condenser paper covering, and finally replace the plastic prop with an Easy B type of prop. One suggestion about the stock Jetco ROG kit - the wing mount is difficult to build and very unreliable. Substitute the wing mount shown below:



In the final consideration, the project is not as important as getting the fun models flying in the hands of scoffers who think indoor is too complicated, and in the hands of those who have never built models before. Projects like the Jetco ROG afford a fairly even start between duffers and more experienced indoor men, and all such projects are a change of pace for experienced outdoor modelers. So, try this avenue to more interest - some of the fellows may suddenly realize that indoor can be fun and try the more sophisticated projects.

Two other ideas are important - first, any program such as I have outlined should be publicized by any and all methods, including displays in hobby shops and grade schools. Second, make sure that the Juniors you are trying to attract have building instruction and transportation to the sessions - too many parents don't care what their kids do as long as they don't have to help them or furnish transportation.

NEWS FROM AROUND THE WORLD

CALIFORNIA - VISALIA

The special HLG contest held in Visalia last month brought out some good times for such small gliders. The ceiling was cluttered and floor area limited, so the wing span was limited to 9". Even so, the top times were: Gary Hover - 0:23.2; Norman Bonacich - 0:22.9; Don Farnsworth - 0:21.1.

COLORADO - DENVER

The Martin Model Masters are well into their indoor season, with their second contest to be held on December 20. They alternate between a Cat. I school gym and the 40' fieldhouse of the Colorado School of Mines - the two sites are on opposite sides of town and this reduces the inconvenience for everyone. They always hold a Jr. HLG event, and the November meet was won by Mike Mock (age 7) with 0:19.5. Real good time, especially since Open HLG was won by Bill Grisking with 0:31.0!

HOLLAND - ROTTERDAM

Cornelis Wolthoorn reports that their planned indoor came off well, and was held in a low ceiling hall in Rotterdam. Since the site was only available for three hours, the session was limited to HLG - the first such Dutch activity in years.

INDIANA - KOKOMO

The Kokomo Aero Team's third indoor contest is set up for Dec. 20, 12 PM to 6 PM at the Bunker Hill AFB Bowling Alley. Events will be Easy B, Paper Stick and HLG. At the November meet, Ed Hughey won Easy B with a new "high" of 9:48.9, Open HLG went to Bernard Boehm with 0:41.2, and Ron Ridgeway won Jr. HLG with 0:24.4.

MASSACHUSETTS - M. I. T.

The indoor sessions at M.I.T. will start with one to be held December 12, 4:30 PM to 8:30 PM. The Armory is located on the corner of Vassar St. and Massachusetts Ave. in Cambridge. The ceiling is 42' peak, and the site record is 16:40 with a C Stick. Sessions are also set up for Jan. 16, Feb. 20, Mar. 20, Apr. 17, and May 5.

MICHIGAN - ANN ARBOR

The Ann Arbor Airfoiler's first indoor meet was postponed by a 4" snowfall followed by a freezing rain. It's rare, but indoor contests can be ruined by the weather! Anyway, the next chance will be Jan. 22 - contact Dick Black for info on the meet.

MISSOURI - ST. LOUIS

The free flight club at McDonnell Aircraft have found a good site in the plant - the Gemini Mock-Up Room. It is 75' x 75' with a 28' flat ceiling, but they didn't say if a security clearance was needed to fly there! The first session produced an "almost tie" of 8:49 by Art Frost and 8:45.5 by Dick Ganslen; 6:05 in Easy B by Terry Hildreth and 0:31.5 by Art Frost in HLG.

OKLAHOMA - TULSA

At long last the Tulsa Glue Dobbers, one of the best-known free flight clubs in the U. S., has scheduled an indoor contest. The meet is set up for February '65, and the date and site has yet to be picked. Contact Bob Hanford, 4318 North Frankfort, Tulsa, Oklahoma for final details on this meet. Good luck to this fine club on this new venture!

WASHINGTON - SPOKANE

All kinds of model building has been at a low ebb in Spokane for some time, so the Spokane Model Boosters were formed. After a busy summer with outdoor events, they have started indoor sessions twice a month in a large gym with 30' ceiling. The group numbers twelve and is growing - look for good things to come.

WASHINGTON D. C.

The D. C. Maxecutors have been holding monthly club sessions in a 38' hangar. Although their first session was spoiled by an emergency aircraft repair and the open doors which went with it, their next session had good luck and good air. Their best times: D Stick - 11:30, Bill Bigge; B Stick - 12:00, Tom Vallee; Paper Stick - 10:48. The club plans a Class AA indoor meet in April and more details will be made available later.

A LOOK AT YESTERYEAR

A Strange Delayed Flight, or - Can You Top This?

by Hardy Brodersen

The event was Junior B mike stick at the '38 or '39 Nats at Detroit; the site was the Grosse Isle Air Dock at Grosse Isle Naval Air Station. Frank Zaic was one of the witnesses (he was an official at the meet).

My flight started nicely with full turns and reached a height of maybe 50 feet, at which point it leveled out and started a moderate rate of descent. The cause was

not immediately known because the model was high enough to be hard to see the cause. As it reached ten feet and below I stood close and was able to observe a large wasp seated on the outboard wing tip, eating away at the sugar coating (we juniors in those days used sugar solution to adhere film, not beer). There was also a modest sized hole at that point. It was the weight of the wasp which gave me the trouble. I took my Navy timer, my approximately 10 minute flight, and my sugar coated hole-y wing to the front of the hangar and presented my case. After some wait for the bull session to pause for official business (some discussion about circular airflow), an official gave this junior his ear, and after some inspection and questions and confirmation by a nodding and voiceless Navy stopwatcher, allowed a delay and restart. I thought the matter settled and turned to go; but I was pulled to face a camera, asked to point, and remember that this was later a detail in a montage in magazine or pamphlet coverage of that Nats.

Are there any scrapbooks in NIMAS land which might have this picture?

Anticlimax: I have the haunting hint of a recollection that that was the best flight ever for that model. It was unbraced, with a carved prop, tear-drop cross-section motor stick, aluminum wing clips, and was covered with apple green and rose JASCO film.

HINTS AND KINKS

Styrofoam Film Hoop

Richard Sherman suggests that good microfilm hoops can be made from styrofoam. He cuts the styrofoam into 1" square strips, joins them with white glue, reinforces the joints with triangular gussets and glue-soaked toothpicks. A nylon string handle completes the job.

Measure Your Motor

To replace the flexible rule which always gets lost or the pencil marks which smear off the box, Charlie Sotich glues a length of dressmakers measuring tape on his boxes.

Wire Bending

Walter Erbach suggests that surgical hemostats can be specially ground at the tips to make miniature needle nose pliers which will easily form special wire parts.

AIRFOILS

Characteristics of Indoor Model Airfoils

by Dick Kowalski

The information used in this study was taken from the Journal of International Aeromodeling and from Suzuki's "Whirling Arm Airfoil Tests" (Zaic Yearbook, 1955).

Quoting from the Journal "The airfoils were tested in the Boston Low Speed Wind Tunnel at a speed of 3.1 ft. per second and at an aspect ratio of 6. The wing planform was rectangular and measured 5" x 30". The airfoil profiles were all derived mathematically from a basic airfoil, which is an arc of a circle. By mathematical relationship, two equations were derived; one to vary the curve forward of the maximum ordinate and the other to vary the curve rearward of the maximum ordinate. With the fixation of the maximum ordinate, it was a simple matter to vary the two equations simultaneously, thereby effecting a series of related airfoils."

Designation of the airfoils is based on the N.A.C.A. system. The first digit "8" designates 8% thickness, the second two digits designate the location of the maximum ordinate in relation to chord. In other words, the 860 is an airfoil with 8% thickness located at 60% Of the chord.

Characteristics and ordinate charts for the Suzuki airfoils was taken from the Yearbook mentioned, however if the experimenter is to use the information presented for the L-44 and L-55 he is cautioned to notice the quite high (comparatively) Reynolds Numbers of Suzuki's tests.

The polar curve below of various model wing sections should tend to verify my conclusions which are as follows:

1. Thickness of camber should be from 5% to 8%.

   The logic:

   a. The polar curve indicates so.

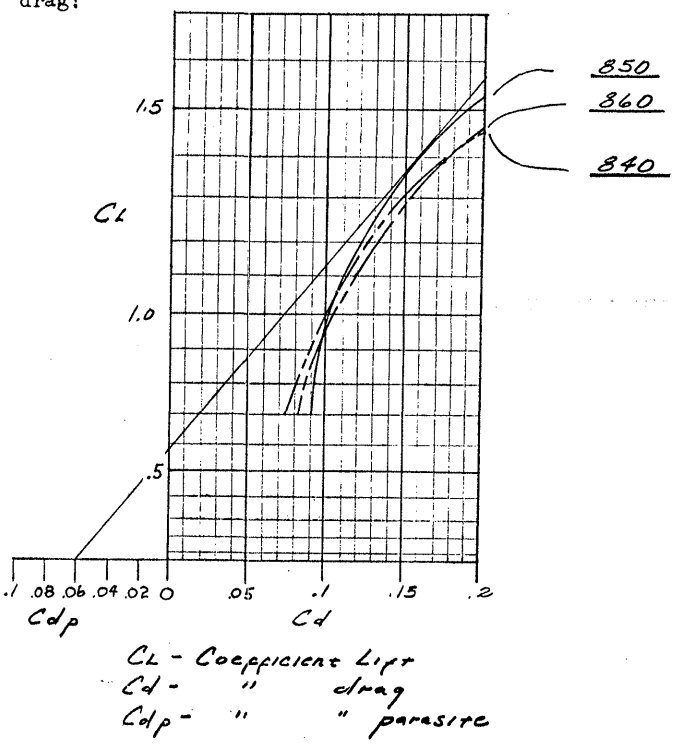
   b. Glide testing and measurement of sinking speed indicate that 7% is the optimum thickness for FAI size models. Sections tested were: L-55, 840, L-44 and two of my own design, Ka-3d (7% @ 50%) and Ka-2b (5.5% @ 50%). I might mention in passing that although glide testing showed the Ka-3d to be superior, the Ka-2b has thus far showed the best performance in the hangars. I used the Ka-3d on my 30:41 Cat. II flight. (Ed. note - this flight was made in the 65' Coliseum in Detroit).

2. High point of camber should be at 50% of chord.

   The logic

   a. Polar curve indicates superior sink rate of 850 vs. either 840 or 860.
   b. Free flight comparisons of 6% @ 40% and 6% @ 50% seemed to indicate better performance for the 50% high point section.

Some presumptions - The energy of the airstream at our speeds is very low, therefore it can only overcome a certain airfoil height and its distance downstream from the leading edge. If all the energy in the air is used in the airflow reaching the section's maximum height, none will be left to hold it to the wing surface toward the trailing edge - i.e. breakaway and resultant high drag!



By plotting the airfoil characteristics on a 3/2 power graph such as above, the airfoil with minimum rate of sink and minimum power (for level flight) will be indicated by a line describing the smallest tangent from vertical with an assumed parasitic drag coefficient of .06. This has been done above to show that the 850 airfoil has a lower rate of sink than either the 840 or 860 at high angles of attack similar to those of indoor model wings.

Editorial comments - In order to lend some perspective to the above information, I asked Dick to estimate the percent improvement in performance to be expected by using the 850 in place of normal airfoils in general use. He deduced the performance difference as follows:

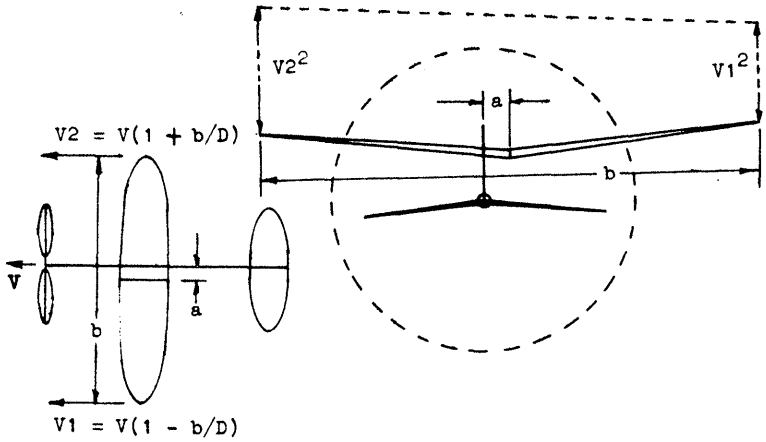
840 - comparison standard, fairly normal section today.
860 - 4½% increase in rate of sink and power required.
850 - 5% decrease in rate of sink and power required.

So - 5% increase is small change and not worth the trouble? It depends upon what you are doing! A 5% jump over a 40 minute flight makes 42 minutes; a 5% increase in U. S. performance at the '62 World Champs would have put us solidly in second place; and Rieke's 45:40 was .8% ahead of Redlin's 45:17. However, in Cat. I where you might expect to get a 12 minute flight, 5% is only 36 seconds, and you will have to decide whether to try it or not!

Hardy Brodersen's "A Case For Wing Offset" kicked off this column in May '64. Here is another approach to wing offset design - complete with a chart which does most of the work for you. Note that Example 1 is the same problem as Hardy dealt with - the results of the two methods agree within 1.5%.

Notes on Wing Offset

by Irving Sherman



The V^2 loading taper-ratio is:

$$k = V1^2/V2^2 = (V1/V2)^2 = [(D - b)/(D + b)]^2$$

The centroid of the resultant trapezoidal loading is:

$$a = b/6\,[(1 - k)/(1 - k)]$$

The span-wise variation of V^2 is parabolic and for low values of D/b the above formulas give a first order approximation. This variation approaches linear as the ratio D/b increases and is virtually linear for circle diameters commonly used. The centroid of the resulting V^2 trapezoidal loading placed over the C.G. determines the offset. Note that the particular form of span-loading is not a factor.

Example 1. b = 35.50 B = 25' = 300"

$k = (264.50/335.50)^2 = (.789)^2 = .623$ and

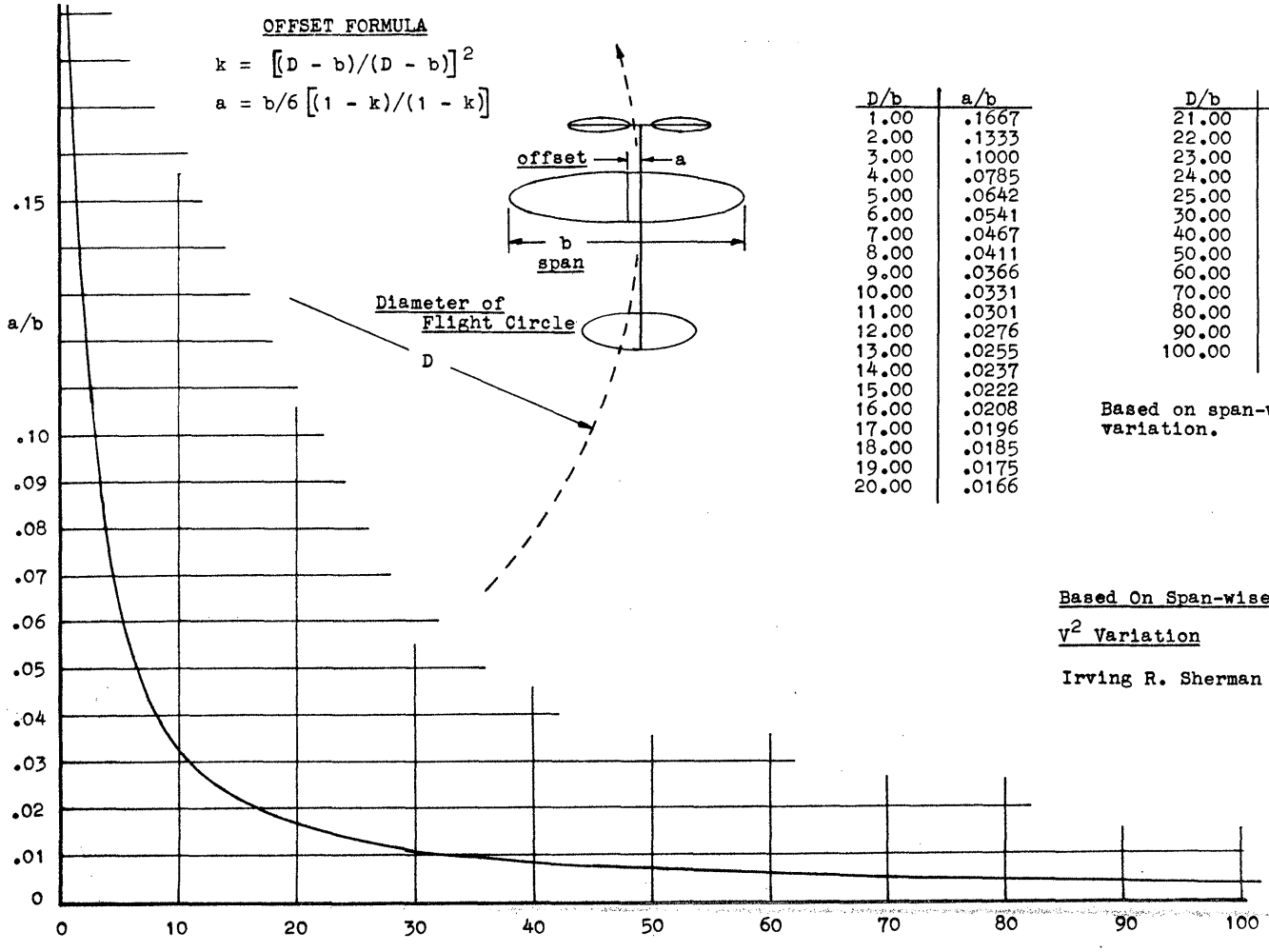
$a = 35.50/6\ (.377/1.623) = 1.375$

Distance from C.G. to tips = 19.125 and 16.375
If C.G. is 1/8" from the stick, distances are 19.25 and 16.25 from mount to tips. Since D/b = 8.45, the computation is accurate.

Example 2. A 40" span wing is mounted 1" offset. If the C.G. were to remain at the stick, how large should the flight circle be for maximum "power off" wing efficiency.

a/b = 1/40 = .025 Interpolation from table D/b = 1 13.3; D = 532" = 44'.

With above set-up, lateral balance is obtained during the last part of the flight provided that only the tail-plane and fin, not thrust, are used to obtain the proper flight circle diameter. The diameter should be checked near the end of the flight. During "power on" flight, the slipstream rotation will increase angle-of-attack of the inboard semi-span and reduce the angle outboard. This will counteract torque but we do not know to what extent. The offset formula accords with and favors the last part of the flight. It does not seem advisable to favor the climb, which could be done by washout inboard and washin outboard - say 1° each - and increasing the offset beyond the formula to balance.



D/b	a/b
1.00	.1667
2.00	.1333
3.00	.1000
4.00	.0785
5.00	.0642
6.00	.0541
7.00	.0467
8.00	.0411
9.00	.0366
10.00	.0331
11.00	.0301
12.00	.0276
13.00	.0255
14.00	.0237
15.00	.0222
16.00	.0208
17.00	.0196
18.00	.0185
19.00	.0175
20.00	.0166

D/b	a/b
21.00	.0158
22.00	.0151
23.00	.0145
24.00	.0139
25.00	.0133
30.00	.0111
40.00	.0083
50.00	.0067
60.00	.0056
70.00	.0048
80.00	.0042
90.00	.0037
100.00	.0033

Based on span-wise V^2 variation.

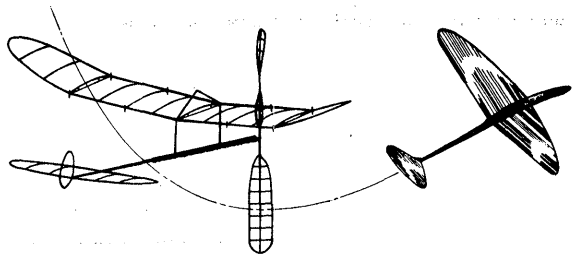
Based On Span-wise

V^2 Variation

Irving R. Sherman

The Voice of N.I.M.A.S. JAN ·1965

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

JON WEXLER, 362 Memorial Dr., Cambridge, Mass. 02139

The New Year

As we move into 1965, a backward look at 1964 is in order. Right up until the Nats and the announcement of the cancellation of the 1964 World Indoor Championships, we had been pretty well holding the line on activity. The late announcement of the Nats dates (it was held a week earlier than usual and a lot of vacations were set for the normal date) undoubtedly cut participation at the Nats, even if the quality of competition was as high as ever. Activity in the big hangars almost came to a standstill - the door is still open at Santa Ana and the Lakehurst hangars were in use by the Army.

Now, as the indoor season rolls around, the normal Cat. I and Cat. II activity is building up to previous levels and one sometimes hears of new groups giving Indoor a try. There is a good prospect of inter-city meets as indoor fliers trek back and forth between Chicago and Kokomo and Chicago and St. Louis. Some more widely separated groups appear to be ready to try postal meets, which will broaden the vistas more. In fact, we have quite a few more sites in regular or occasional use in 1965 than there were in 1964, and there are prospects of more to come. With a little "push" by each of us, 1965 can be a year of growth for Indoor, so why don't we do it?

Christmas Cards

We wish to express our appreciation for the many cards, letters and good wishes we received from our NIMAS friends all over the world. This has made it a nicer holiday season for our whole family.

New Materials!

Ted Pfeiffer passes on the suggestion that the mess and splatter of our normal rubber lube was done away with by using Dow Corning #4 Silicone Grease to lube the motors of his scale jobs. Since this material protects against ozone and oxidation, it should also be a preservative for rubber. We also have a sample of silicone lubricant furnished by Jess Sheppard which we will try as soon as possible.

There is one caution in connection with silicones - I have heard of a case where silicones have destroyed the strength of glues such as we use. It would be advisable to avoid touching wet glue joints during field repairs if you have been using any synthetic lubricant. Merely wiping your hands would not be sufficient - all it takes is a tiny trace of the silicone to do the dirty work!

NIMAS Awards

Several people wrote to express enthusiasm for the concept of NIMAS Awards as expressed in the last issue, and to urge their early adoption. As a result, it has been decided to set up the system effective Jan. 1, 1965. These standards were adopted to govern the Awards:

1. The flier must be a NIMAS member.
2. Both the models and the circumstances of the flight must meet current AMA regulations.
3. Flights may be made at a sanctioned contest or at a non-sanctioned flying session; in either case an AMA Contest Director must witness the flight. The flier must furnish the following information over the signature of the C.D.:
   a. Flight time and details of the model.
   b. Brief description of the site.
   c. Contest sanction number and date.
4. In the case of a non-sanctioned event, the application form must be signed by an AMA C.D. and two witnesses who are also AMA members.

Application forms will be sent out with one issue soon; if you need one in the meantime, drop a line and we will send you one. Special arrangements will be made for Honorary NIMAS Members (overseas subscribers) and for our Canadian members. Those members of other National Aero Clubs besides AMA please drop a line describing the procedure for recognizing national records in your country if you are interested.

Postal Contests!

To further clarify the postal contest concept, it is well to observe that the participants need not fly on the same date. The benefits and purposes of the contest will be adequately preserved if the results from the earliest contest are enclosed in a sealed envelope and sent with a covering letter to the opposing team. When the second or opposing contest is held, their results are similarly mailed off, then the results from the first contest can be opened. This way, the second team will fly their best and their anticipation and curiosity will remain at a high level until the flying is finished and the results are in the mail - exactly as if the events were held on the same day and the results mailed right after the meet.

Although the normal AMA procedures and regulations should apply, the opposing teams can well agree ahead of time on special handicaps or procedures. For example, if both teams have small sites with high drift, balloons could be used by both teams to overcome the effects of drift. Or, both teams could agree to allow bracing on Easy B - or any other special or limiting feature.

Add another to the list of challenges - the Detroit Balsa Bugs vs. any other club, Cat. I postal meet in IHLG and Paper Stick.

The Hacklinger Thesis

Last month we reported that "Theoretical and Experimental Investigation of Indoor Flying Models" by Max Hacklinger was made available to INAV by the courtesy of Ron Moulton and the Royal Aeronautical Society. An offer to copy the report and furnish it at cost was made; to date enough copies have been ordered to permit economical reproduction. The first printing will be made about Jan. 20, 1965, and any orders received before then will be filled at $1.25 per copy. After that time, additional orders will be filled in lots of 5 at about $1.50 each. The report is 7 pages of print approximately the size you are reading, including 13 graphs and charts. Topics covered are strength of materials, aerodynamics, power sources, flight performance, flight characteristics, airframe elasticity, and hail meteorology. If you intend to order one of these reports, it would be appreciated if you do so in time for the first printing, to save me extra trips to the print shop.

FAI INDOOR REPORT

Bob Champine reports on the November CIAM meeting:

"This note is to provide you and INDOOR NEWS AND VIEWS with some advance dope. The official word will be sent out by AMA soon I hope.

1. The 1964 World Championships for Indoor is cancelled permanently because only four countries presented teams; five are required. The USA or England will consider arranging an international contest without

World Championship status for those countries interested during the year 1965 if there is enough interest. Proxy flying is permissible and world records can be established.
2. The 65 cm. span rule was not approved.
3. When using the balloon, the timers must warn the competitor of other models that might be endangered by the balloon. If another model's flight is interrupted, that competitor will be allowed another flight.
4. The timers will keep their watches running for 10 seconds after a model hits an obstruction. If the model hangs up, 10 seconds will be subtracted from the flight.
5. Indoor ceiling height categories (per AMA) were suggested. This will be considered next year after a trial period."

INDOOR RULES

Record Trial Attendance Proposal

Several times in past years indoor fliers have advanced the idea that indoor Record Trials should be excepted from the attendance stipulation in Par. 2.2 of the AMA Rule Book which says, "All records, to be eligible for recognition, must be made in sanctioned competition in which there are 10 or more contestants who have presented models for processing and which are conducted under the regulations of the Academy of Model Aeronautics."

In recent months the C/L Contest Board approved a proposal stipulating that C/L Speed records must be set at Class AAA and Class AAAA meets only. With a precedent for modifying Record Trials requirements already established, a proposal was submitted to the Indoor Rules Committee and to the FF Contest Board via Phil Klintworth. The text of the proposed modification to Par. 2.2 and the supporting arguments read as follows:

Cat. I - A minimum of 5 fliers must present models for processing.
Cat. II - A minimum of 8 fliers must present models for processing.

This change is proposed for these reasons:

1. A large number of people in a small site degrades the flying conditions and the duration in proportion to the number of people present.
2. Most small sites are made available at low cost or gratis; as a result the site is usually available about 3 hours per session. The time factor coupled with the small available space drastically curtails the amount of flying done by each person; this tends to limit interest and activity.
3. Because of the above conditions, small sites foster formation of small groups; the present requirement for a minimum of ten fliers requires almost everyone to turn out to validate any given event.
4. The foregoing factors tend to artificially limit model performances to well below their potential; this tends to limit the activity to some extent.

HLG Proposal

Last month it was reported that the HLG Scoring Proposal was submitted for final vote with a deadline set up to permit inclusion in the 1965 Rule Book if it passed. In spite of the fact that this proposal (and certain FF proposals called at the same time) had been "in the mill" for some time, one member of the FFCB objected to early adoption of the proposals. To clarify the situation an additional vote was called for - each member of the FFCB was asked to vote whether the proposals should become effective (if passed) on Jan. 1, 1965 or Jan. 1, 1966. Since the IHLG proposal has been around since 1961, it is unfortunate that there is some possibility of it being delayed another year, especially since it had met with favor by most indoor fliers for all that time.

HINTS AND KINKS

Three More Hints

Ted Pfeiffer suggests that teflon scrap can be sharpened to a fine point and used as a glue stick. The glue beads up at the point to ease application, and dried glue will clean right off.

Ted also suggests that aluminum 30 mm. film cans make ideal storage containers for rubber motors.

Too often, when you climb up after a hung model and relaunch it, it merely climbs back up and hangs up again. Ron Ganser suggests that the prop be locked by sticking a piece of 1/32" sq. balsa through the prop hook and then gliding the model to safety.

STATE OF THE ART

The Merganser Ornithopter

by Ron Ganser

First off, the name is that of a wild duck. The call is ME R GANSER - what else could you ask for? I have built about 2 dozen indoor ornithopters of many designs and wing flapping setups such as Jerry Murphy's, Reg Parham's and others. Johnson of our group is working on a setup like a swimmer doing the butterfly stroke (real wild). I believe this design was first the work of Dennis Turner of Chicago in the '40's. This possibly is the same type Carl Goldberg used in his 4:05 record set in 1941; the design may even be his.

I have found that the flapping wings do not give any lift but propels the model through the air the same as flippers on a swimmer's feet. Then you say how does Reg Parham's ship fly with no fixed wing? It is done by the acute stab incidence forcing the nose up in flight. I use zero degrees incidence in the bottom wing and the stab with about 2½ degrees in the top wing. If the climb becomes too steep the top wing will stall and lose lift. I found that my time just about doubled after adding the top wing - before, the model wouldn't climb at high speed. This was caused by the stab lift overcoming the wing and holding the nose down. Now my ships climb like a gas job.

At the Cat. II Record Trials at Detroit the ship climbed to a speaker about 45' high, hit it and tore the mike loose on the LE of the top wing. The mike billowed up into a drag brake and brought the ship down with only 2:20. I have had trouble with the mike splitting on the top wing due to vibration. By using 1" rib spacing and taut film this was overcome. The C.G. should be about 80% but it is not critical - each one just about flies right off the board. My model has a pretty good glide and this makes for a slow descent.

If you find you have trouble getting the model to turn tight (20' circles) with rudder offset (wing stroke not perfectly timed) just take a pair of scissors and trim down the left wing."

INDOOR ELSEWHERE

New Zealand

Although relatively few modelers in New Zealand are active in indoor, the state of the art is well advanced. The N. Z. indoor rules were revised and simplified in 1963, leaving two Spar (comparable to Indoor Stick) classes - Under 18" span and Over 18" span (max. 90 cm.); IHLG, Easy B, and 2 classes for Round The Pole models. This change was unpopular with many fliers, and it may have been reversed, since a recent letter from Jack Eriksen mentions Ornithopter and Fuselage (Cabin). Also the New Zealand rules make provision for Cat. I, except that the ceiling limit specifies under 30' instead of 35' as in U. S. rules.

Some recent Cat. I records that have been set in the 22' site in Avondale are:

Ornithopter - 1:09.1
Fuselage HL - 8:36
Over 18" ROW - 5:57
Under 18" ROG - 9:09
Easy B - 7:07
Fuselage ROG - 7:06
Under 18" ROW - 2:32
Over 18" ROG - 9:01
Over 18" HL - 12:29

WHAT A GOOF!

Last month in DESIGN FOOTNOTES, two formulas were incorrectly presented. These two formulas should have read:

$$k = (D - b)/(D + b)^2 \qquad a = b/6\ (1 - k)/(1 + k)$$

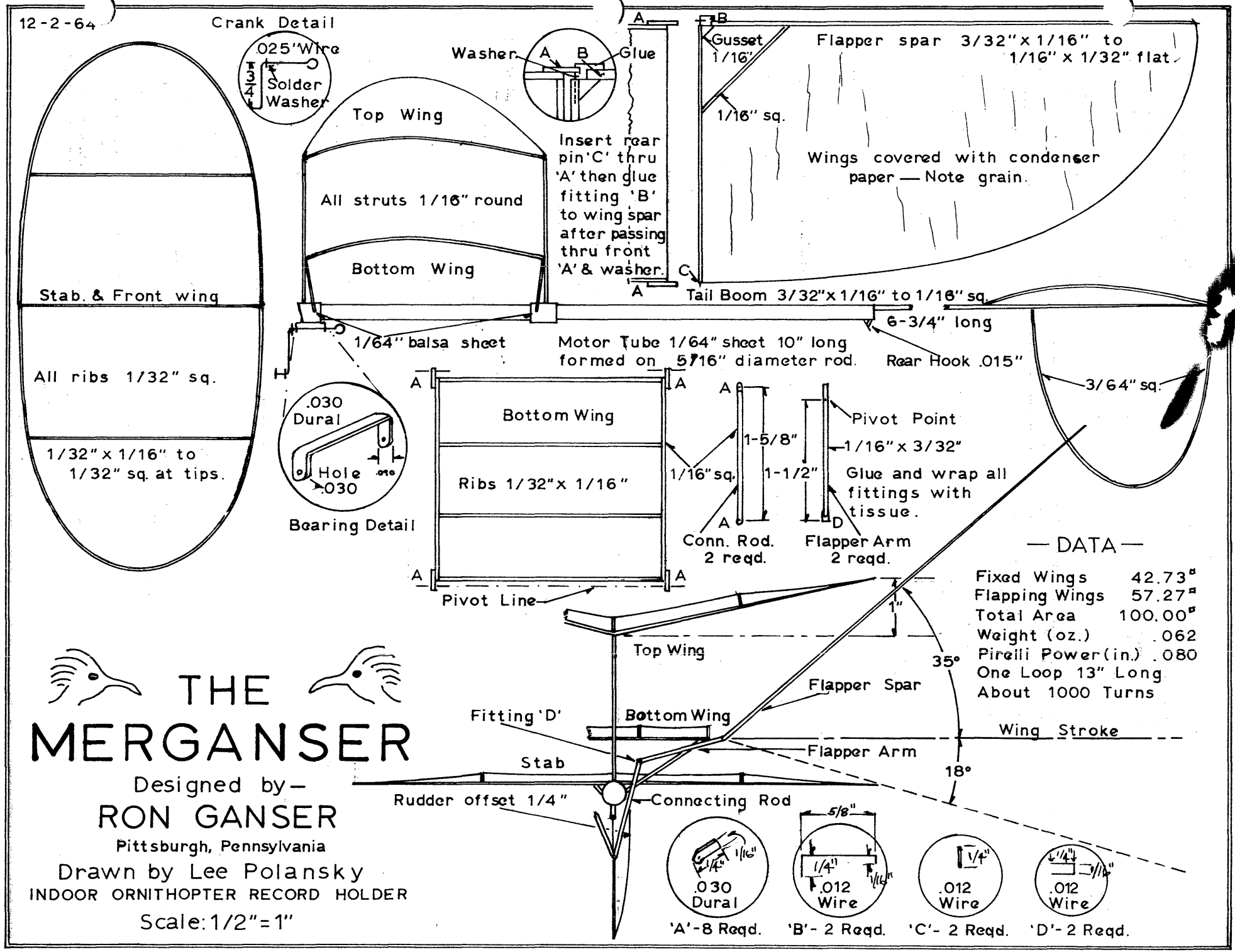
I'm sorry if this error has caused any confusion to anyone - and thanks to those who called me down on it!

RECORDS? MAYBE!

ST. EDWARD'S HIGH SCHOOL RECORD TRIALS - Nov. 29, 1964*
CAT. I, St. Edward's High School Gym, 33' Ceiling
Junior C Cabin - 1:10, Patrick Tchou
Junior D Stick - 3:48, Patrick Tchou
Junior B Paper - 7:38, Bill Schubert
Senior A ROG - 8:30, Larry Loucka
Senior Autogyro - 2:38, Larry Loucka

*This listing in addition to the two listings made in the December 1964 INAV.

12-2-64



THE MERGANSER

Designed by—

RON GANSER

Pittsburgh, Pennsylvania

Drawn by Lee Polansky

INDOOR ORNITHOPTER RECORD HOLDER

Scale: 1/2" = 1"

— DATA —

Fixed Wings	42.73"
Flapping Wings	57.27"
Total Area	100.00"
Weight (oz.)	.062
Pirelli Power (in.)	.080
One Loop 13" Long	
About 1000 Turns	

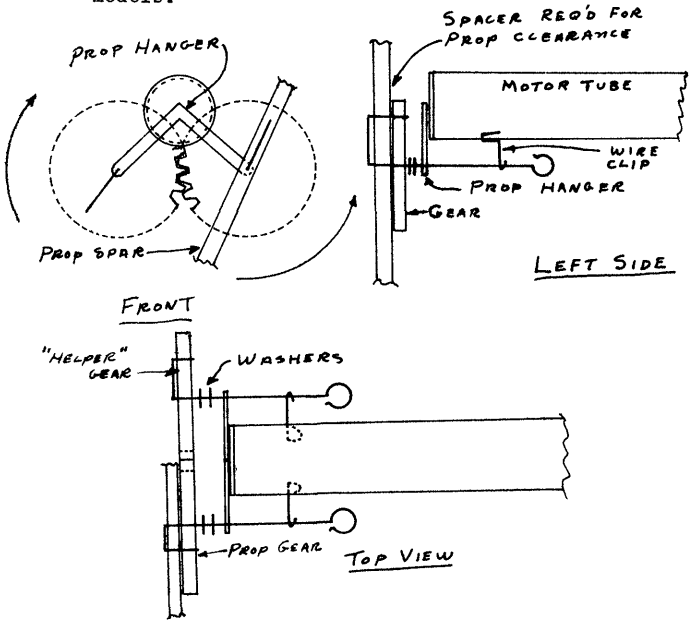
THE ATWOOD GEARS

For some time Bill Atwood has been using gears on his indoor models with very good results. Very few people besides Bill and Bruce Paton have used the gear set-up in spite of the fact the gears have been available from MicroDyne for over a year. Probably the main trouble has been lack of information, so this report is intended to clear up some of the mystery.

Basically, the system consists of two motors with very small cross-section compared to single motors of the same weight. Each motor drives a small plastic gear at the front end of the motor stick. The motors are wound simultaneously and with opposite twist so that the torque of one motor adds to the other. For example, the left motor (with the prop attached) is wound normally and the right motor is wound "backward" so it aids the first one in turning the prop. (Refer to the sketch below.)

The following advantages are claimed for the geared model:

1. The motor stick will be somewhat shorter, since the rubber loops can be shorter and still store enough turns.
2. Stick construction can be relatively lighter since the main loading is compression. That is, with the motors wound in opposite directions the torsional loading cancels out. It would be possible to mount the motors on opposite sides of the stick to cancel bowing; they are lower than center to retain some of the bowing to control power stalls.
3. The torque curve of two motors in parallel is flatter and thus enhances the cruise portion of the flight. The implication is that the model spends more time at a lower altitude. Bill has made many 30 minute flights from low altitude, and his models never were in danger at the FAI Flyoffs in 1963 though he made flights of 41:26, 43:17 and 42:36.
4. One theoretical advantage which has been discussed in regard to the geared model has to do with higher output from small cross section rubber. That is, two loops of .040 rubber would have a higher output than an equal weight and length of .080. The energy gain may be as much as 10% and could conceivably be related to hysteresis loss in the larger cross- section. In other words, a similar gain could possibly be realized by flying multistrand motors on conventional models.



The drawings above were made from observation of one of Bill's FAI models; the motor stick was 13 3/4" between hooks and the prop was 20" diameter adjustable pitch and was set to about 30" pitch.

Some concern is likely over the added weight of parts on a gear model - the gears are available in 3/8" dia. and 1/2" dia.; a set of 3/8" gears check out at .0025 oz. In addition, there are two each of the standard hardware, but wire sizes can be smaller since the rubber load on each one is less. Some precautions in application and building are important:

1. Carefully aligned gear mounting is mandatory, since misaligned gears will absorb a lot of power. For the same reason, double thrust bearings are used.
2. The motors should be matched, and a special winder with dual output shafts turning in opposite directions must be used.
3. Be sure that there is proper clearance between the back of the prop spar and the "helper" gear - the drawing left out a spacer which should be shown.

Bill made this comment about the system: "As far as gears are concerned, I would explain it this way. You can put 2100 turns in a good loop of .060 and the prop averages 48 RPM; this figures out to 43:45. Then you take the same model, split the rubber or use two loops of .040; these will take 2760 turns. If the prop averages 55 RPM, you come up with 50 minutes. I believe my sticks are lighter than some that I built for single motor jobs. I have some new models that are flying at 50 RPM average with 19" loops of .040 which will take 2800 turns."

DACRON FACTS

Bill Bigge recently ran a series of tests on the dacron bracing material which I've been furnishing to all who want it. His report follows:

"My measurements show tensile strength of 122,000 psi, 87% recovery of an 8% strain, elongation to break of 10%, and a Young's modulus of 2.5 million psi. All of which means your stuff is 'harder' or more aligned than the handbook stuff. A Young's modulus of 2.5 million psi versus steel at 30 million psi means the dacron is about 40% as effective by weight as steel, for rigidity. It is 2⅔ times as strong as steel at 250,000 psi, by weight - a good trade.

The dacron has a tendency toward delayed strain recovery, with time for recovery probably dependent upon time under strain. For light model (like an A ROG) it should be worthwhile to avoid ever straining the filament with more than 20 times the force on the bracing in flight. The shock resistance of dacron makes it a joy to use on a heavier model, but it is also so light that it can be used to advantage on a model whose spars it can buckle during strain recovery, if the filament is handled rudely. I expect to start a filament, tie it to a .05 oz. weight, hang it over a smooth wire, and pull it the rest of the way without applying any more tension than will raise the weight."

Several of you have feared that I might have run out of the dacron - but the original sample was two one-pound spools. That figures out to be about 5 million feet of monofilament, or about 1000 miles. A typical sample I have sent out has been 10' of 50 strand bundle and 10' of 250 strand bundle - about 3000 feet of monofilament if you manage to use it all! So, if you want some dacron to try, or want some more, send a stamped, self addressed envelope to me and I'll send you a sample.

A LOOK AT YESTERYEAR

Hardy Brodersen shares these memories, and calls to mind one of the old-time "secrets" of high time:

"In Detroit in the late '30's and early '40's there were indoor meets held in conjunction with the State Meet every year, usually at the Cass Tech Auditorium (maybe 60' with balcony and chandeliers). Detroit was divided into two camps: East Side and West Side. I was an East sider - colleagues were Bud Bobier, Harold LaClair, Walter Hartung and other faces with unrecalled names. The West siders included the Detroit ace Ed Naudzius and a flock of proteges. Every event was full battle, from ROG to B and C mike stick and cabin. And the ROG, being little and unpromising in size, found special attention as an event in which to score in this battle. Now in some preliminary meets the west siders came up with some strange looking paper. White, apparently mutilated, mottled, almost full of holes. And they flew two or three minutes longer than ours. What was the secret? After they took the State meet in that event we poor defeated were given the lowdown: Superfine white tissue was spread on a sheet of glass and wetted. The correct amount of wetness allowed one to roll away more than half of the paper fibers with the finger. When the paper dried on the glass you had a very flimsy but sufficiently airtight and significantly lighter paper with which to cover the surfaces. I quit building about then after an accident while returning from a Scripps-Howard meet in Akron, and don't know if this caught on or how long this antedated the use of condenser paper. My next exposure to indoor modeling in the late '50's found condenser paper in general use. Anyone recall or use this technique?"

NEWS FROM AROUND THE WORLD

MASSACHUSETTS - M.I.T.

The next session at the M.I.T. Armory (Vassar St. at Massachusetts Ave.) is scheduled for Jan. 16. Contact Jon Wexler, 362 Memorial Dr., Cambridge, Mass. 02139 for details. The site is 42' to peak, top time 16:40.

MISSOURI - ST. LOUIS

To quote a comment in the McDonnell FF Club Newsletter, "Indoor flying activity is - and promises to be - elevated to a level it has not enjoyed in St. Louis for the past 25 years. The upward spiral promises to continue into the spring season." The activity is centered around the Washington University Fieldhouse (girders at 40'), but they are investigating the Armory at 3676 Market Street in St. Louis. This site has girders at 60' and a floor area of 245' x 142'. There will be an AMA indoor meet in the Armory on March 28, and if satisfactory, the remaining meet set for May will also be held there.

NEW YORK - VALLEY STREAM

Ted Pfeiffer reports that indoor sessions are being held in the Valley Stream Memorial High School gym by the Valbrook Model Airplane Club. The next session is set up for Jan. 22 - contact Miss Irene Murer, 35 Albert Road, Valley Stream, N. Y., for details.

PENNSYLVANIA - PITTSBURGH

The indoor group in Pittsburgh headed up by Ron Ganser, Norm Bickar and Ken Johnson are flying at least once a week somewhere in town. They also have about two week notice for their sessions in the Soldiers & Sailors Memorial Hall (50'). Contact Ron Ganser, 2500 Mission St., Pittsburgh 15203, for more details.

TEXAS - DALLAS-FT. WORTH

The Cliff Model Club has a series of Cat. I sessions and a Cat. II contest on tap for this season. The first session will be held at the Arlington Recreation Hall on Jan. 10 from 1 PM to 5 PM. The contest is planned for February and will be held in the Drill Hall at Dallas NAS with Indoor Stick, IHLG, indoor scale, helicopter and indoor towline. Contact Jerry Murphy, 1740 Sharon, Arlington, Texas for more details.

WASHINGTON D. C.

The D. C. Maxecutors held another session in December and boosted club records again. The site is a hangar, 38' to the girders. The records are: Paper Stick - 10:48, Dan Belieff; A ROG - 7:17, Bill Bigge; B Stick - 13:02, Tom Vallee; D Stick - 12:30, Dan Belieff; HLG - 0:40.2, Bob Champine. Contact Tom Vallee, 9136 Edmonston Rd. #304, Greenbilt, Md. for info about future sessions. Late word: Next Session Jan. 9, 4:30 PM, Wash. Nat'l Airport!

CANADA - ONTARIO

A group of about 18 Canadian modelers have found two indoor sites - one 21' and the other 42' - and are trying to restore the indoor activity which flourished in the Toronto area 25 years ago. Joe Eisen, the FAI Chairman for Canada, is heading up the movement and can use any suggestions and encouragement you can offer. Contact Joe at 170 Waterloo Ave., Downsview, Ontario, Canada.

CONNECTICUT - SAYBROOK

Members of the Southern Connecticut Aero Model Association have been holding indoor contests for two years, flying IHLG, B Paper, Easy B, flying scale and indoor payload. Their November contest featured Easy B, scale, and HLG; the December meet had the same events and was held Dec. 27 at Choate School. Contact Jack Whittles, Millrock Road, Saybrook, Conn. for details.

ILLINOIS - CHICAGO

Pete Sotich announced the indoor contest schedule for 1965: Jan. 30, Feb. 27, Mar. 27, Apr. 24; 9 AM to 4:30 PM. Except for the Feb. 27 contest (8th Annual Chicago Aeronuts Indoor Contest) the events will be supported by the fliers themselves. The Jan., Mar. and Apr. meets will have Novice (age 10 and younger) events; Junior events will be IHLG and Easy B; and Open events will be IHLG, Paper Stick and Indoor Stick.

A contest was held Dec. 19, 1964 to kick off the season. Winners were: Novice HLG (5¢ gliders furnished by Aeronuts) - 0:05.0, Janice Nakashima; Jr. HLG - 0:44.8 Jim Thornberry; Op. HLG - 1:01.1, Bob Larsh; Jr. Easy B - 7:23.7, Teddy Mills; Op. Easy B - 11:38.2, Charlie Sotich; Op. Paper Stick - 15:20.2, Wally Mumper.

INDIANA - KOKOMO

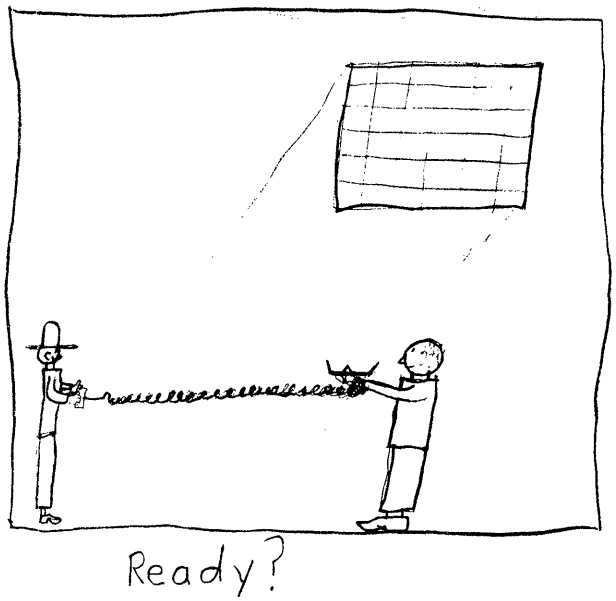
The Kokomo Aero Team will hold their January indoor meet Jan. 17 at Bunker Hill AFB. Contact Chuck Borneman, 1401 West Taylor, Kokomo, 46901 for further details.

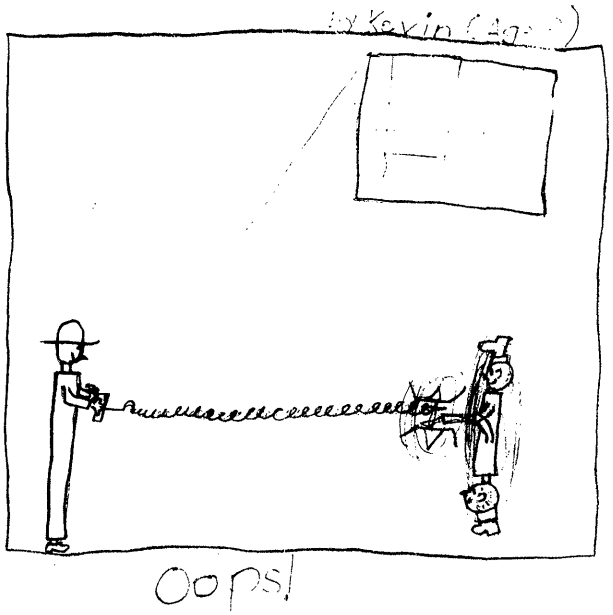
MICHIGAN - ANN ARBOR

The Ann Arbor AirFoilers' January meet will be Jan. 22, along with a sanctioned record trials for Cat I. The cancelled Dec. meet was to be rescheduled for Jan. 8, if the weather didn't interfere again. Contact Dick Black, 1717 Covington, Ann Arbor, Mich. 48103 for details.

MICHIGAN - DETROIT

The Balsa Bugs held a novelty meet for paper gliders on December 10. Out of 12 entrants, 4 timers and half a dozen hecklers, Pat Green emerged winner with 0:10.5. The Junior event was won by Art Markowitz with 0:08.2. There are more monthly sessions set up; contact Pat Green at 16880 Woodbine, Detroit 19, Michigan for dates and events.





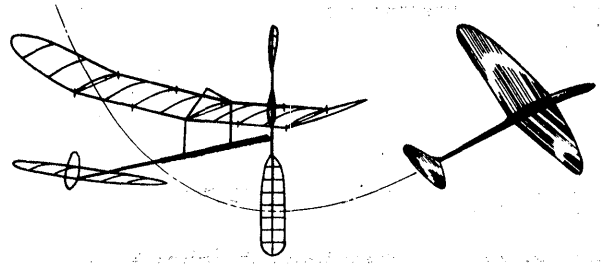
LAST MINUTE BULLETIN

All you indoor scale fliers look on page 17 of the Feb, '65 M.A.N. - a very nice model by Walt Mooney, with full size plans, yet! If you like it, or if you don't, write the editor and tell him what you would like. Since we indoor fliers are a minority group, we should always take a few minutes to express appreciation to the editor when indoor models are published - otherwise he may think we aren't reading the magazine and publish U/C or R/C!

FINAL COPY

The Voice of N.I.M.A.S. FEB ·1965

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

ED COLLINS, 4318 East Utah Place, Denver, Colo. 80222
BOB TRAMPENAU, 924 Scio St., Elmira, New York 14901

Sponsored Junior Members

It is pleasant to welcome Lynn Adams, Route 2, Gretna, Va. 24557 as out newest sponsored Junior Member. Some of you may have read Lynn's plea for help with his modeling problems in the "Man At Work" column in the October '64 M.A.N. Reggie Batterson read it and dropped by to meet Lynn, started him on Indoor, and finally nominated him for sponsored membership.

Lynn started his model activities with a 29¢ Testors catapult glider and flew it until there were just too many masking tape patches for it to fly any more. He continued with commercial gliders and rubber models until age 11, when he bought a Wen-Mac and built some pre-fab U/C models for it. He is now 13, and is building indoor paper models under the guidance of Reggie. Reggie made a glowing report on Lynn's progress, so we should see some good things out that way soon. My congratulations to Lynn, and a big vote of thanks to Reggie Batterson for his caring enough to help another flier get started.

Spread The Word!

In order to practice what I've been preaching, I've been giving programs on indoor models to various groups. The most recent session with a non-modeling group (and by far the most responsive group) was a talk on models to a Cub Scout pack. The boys were already acquainted with the names of the airplane parts, but didn't know about dihedral. Some of them already knew about trim to some extent, but each was furnished with a nickel glider to trim out as a demonstration of what he was learning. After two sessions of practice flying separated by more discussion of what happened, the meeting was finished by flight demonstrations of Jetco ROG's and showing Easy B and B Stick models. If anyone would like an outline of the demonstration and suggestions for such a program, drop a line and I'll send it.

Have you any flyable but outdated indoor models? Why not build a simple display case for them (see NIMAS Display in Apr. '64 INAV) and set it up in a local hobby shop. The NIMAS Display case was pulled out of retirement and set up in the local hobby shop, where it causes quite a bit of comment and interest.

Reggie Batterson has accepted the task of developing and coordinating a public relations and publicity effort on behalf of NIMAS. He can use any help and suggestions anyone can offer on methods of securing sites and keeping them, copies of newspaper articles which publicize indoor contests, copies of news releases and posters and such that you have used to announce indoor contests, etc. One ultimate goal will be a program which we hope to present to some national organization such as YMCA in an effort to gain help and perhaps sponsorship.

Finally, Reggie is developing a poster for NIMAS members to use in local publicity campaigns and the like. It is designed to be placed in schools, hobby shops, YMCA facilities and any place else that has a bulletin board open to public viewing. If you would like to get some of these posters when they are prepared, drop a line to Box 545, Richardson, Texas, and let me know how many you can use. Since there will be some investment in printing the posters, we would like to know how many will be used - so drop a line.

An Important Article

In case you tend to skim over MODEL AVIATION when it arrives, turn to page 10 of the Feb. '65 issue. There you will find "Endurance of Indoor Models Under Low Ceilings" by Hewitt Phillips. Old-timers in Indoor know and respect Hewitt for his theoretical and practical work with indoor models, and this analysis can be highly recommended for all indoor fliers to study.

That Hacklinger Thesis

Since last month's announcement about the price and availability of the Hacklinger thesis on indoor models, the number of orders which came in forced a quantity printing which reduced the cost per copy. Those who sent the $1.25 requested received a refund of 25¢ with their copy, and there are some left-over copies available for $1 each for as long as they last.

FAI INDOOR REPORT

In a flurry of activity during January, the FAI Indoor Committee membership was completed and the team selection program was proposed. The selection program has since been approved, so the info below is official. First, the Committee membership is:

EASTERN ZONE
Bob Champine
25 Beechwood Drive
Yorktown, Virginia

WESTERN ZONE
Tom Finch
2444-C Chelsea Place
Santa Monica, Calif.

NORTH CENTRAL ZONE
Paul Crowley
32604 Tecla
Warren, Michigan

SOUTH CENTRAL ZONE
Bud Tenny
Box 545
Richardson, Texas

CHAIRMAN
Bruce Paton
1010 North Mirasol St.
Santa Ana, California

1966 Team Selection Program

Local Qualification Trials

1. Must be held before the end of April 1965.
2. At least four entries to be flown to make a "trials" official.
3. Can be flown under any ceiling height.
4. Entry Fee - Juniors and Seniors $1.50 - Open $3.
5. FAI rules to be used.
6. Not necessary to fly "rounds."
7. Top 80% of entries to qualify for "Quarter Finals."
8. A contestant may attempt to qualify in any of the trials in his Zone.

Zone Quarter Finals

1. Must be held before the end of May 1965.
2. Qualifiers can enter any "Quarter Final" in their Zone, but only one.
3. Can be flown under any ceiling height.
4. Entry Fee - all contestants $3.
5. FAI rules to be used.
6. Not necessary to fly "rounds."
7. Top 80% to qualify for "Semi-Finals."

Zone Semi-Finals

1. Must be flown before the end of June 1965.
2. Qualifiers can enter only the Semi-Final held in their Zone.
3. Can be flown under any ceiling height.

4. Entry fee - all contestants $5.
5. FAI rules to be used.
6. "Rounds" will be flown.
7. Top three (3) from each Zone to qualify for "Semi-Flyoff" (If less than five (5) contestants enter Zone Semi-Finals the top 50% will qualify for the Fly-Off).

Semi Fly-Off

1. Will be flown during the week of 1965 Nats.
2. Entry fee - all contestants $5.
3. FAI rules to be strictly observed.
4. Top three (3) men will represent the U.S.A. in the 1966 "World Championships."

General

1. A qualifier who is unable to attend the Quarter or Semi-Finals is obligated to notify the next man in line at least one week prior to flight date.
2. It is expected that the Zone qualifiers for the Fly-off will be provided free transportation to the site of the Semi Fly-off, if arrangements can be made to hold the Fly-offs during the week of the Nats. (If the host country for the 1966 Finals selects a Cat. II site, an attempt will be made to hold the Semi Fly-off under a similar ceiling.) In order to qualify for free transportation the qualifier must commit himself to the committee Chairman within seven days after the Semi-Finals. At the same time he should commit himself in intent to attend the World Championships, if he should win a team position.
3. Commitments to attend the World Championships in 1966 should be reaffirmed by team members within 90 days following the Nats.
4. The three (3) 1964 team members will automatically qualify to fly in the Semi Fly-off without having to enter qualification meets.
5. All "Trials," Quarter Finals and Semi-Finals are to be AMA sanctioned. AMA sanctions for FAI events are $2 and should be applied for through Contest Coordinators by AMA CD's on standard sanction application forms, exactly as for AMA contests.

INDOOR RULES

Rules Changes For 1965

As has been announced in MODEL AVIATION, IHLG records started from scratch as of Jan. 1, 1965. All old records were voided by two rules changes: The models must be of "solid wood throughout" (except nose weight, i.e. monofilament, etc.); and flight scoring is the best two of nine flights. Also, FAI Indoor has been added as an AMA event and eight of the nine new records are still up for grabs as of the Feb. '65 MODEL AVIATION record listing.

Status Report on Rules Committee

The end-of-year status report from the Indoor Rules Committee appears on page 14 of the Feb. '65 MODEL AVIATION. A summary of the Indoor Rules Questionaire is included - you may find some surprises there!

GREAT LAKES INDOOR AIR MEET

Once again the annual Great Lakes Meet proved to be the world's largest indoor meet, an aerial circus, and high point in an excellent model airplane program set up in Cleveland by Chuck Tracy. Emphasis is placed on the younger builders, and they are benefitted by special age groups. DODO fliers are 9 and younger, BANTAMS are 10 and 11, FLEDGLINGS are 12 and 13 and JUNIORS are 14 and 15. SENIORS and OPEN correspond to AMA age classes. First place winners (and survivors of over 5000 official flights) are:

HLG: DODO - 0:23.5, Patrick Murphy; BANTAM - 0:45.6, Terry O'Malley; FLEDGLING - 0:38.3, Terry Kuehne; JUNIOR - 0:49.1, Bill Schubert; SENIOR - 0:57.0, Tom Strachan; OPEN - 0:59.9, Larry Miller.

PREFAB MODELS: DODO - 1:19, Thomas Dikovitsky; BANTAM - 1:11.8, Mark Reich; FLEDGLING - 1:32, Dave Obarski; JUNIOR - 1:15.4, Kurt Reich; SENIOR - 2:23.1, Herb Schubert; OPEN - 2:06, Mike Karlak.

PAPER STICK: BANTAM - 8:15, Terry O'Malley; FLEDGLING - 6:16.4, Susan Weisenbach; JUNIOR - 7:56, Bill Schubert; SENIOR - 12:39.8, Jim Skinner; OPEN - 12:38, Joe Hindes.

MICROFILM STICK: JUNIOR - 8:02.6, William Hulbert, Jr.; SENIOR - 15:18.4, Neil Shipley; OPEN - 16:10, Pat Green.

STATE OF THE ART

The Easy B Comes of Age!

About four years ago Wally Miller invented a "formula model" which was soon dubbed the Easy B. The concept was to specify the wing span and a maximum wing chord, limit the prop to sheet balsa blades, and to specify solid tail boom and motor stick. In short order, the Easy B was flown all over the U. S., and New Zealand officially set up an event for these models. Paper covered Easy B's have pinch-hitted in the Paper Stick class; a microfilm covered Easy B set a Cat. I Senior B Stick record of 10:38.6; in the hands of beginners the Easy B racks up five minute flights in Cat. I; and in the hands of experienced flyers it will top 15 minutes in Cat. III. Never before has an indoor model type been so many things to so many people - and where regular competition is held for Easy B, the times just keep improving.

One facet of the Easy B is the fact that the event is not entirely defined. Each group that flies the Easy B decides something different for their own rules, and yet the essential character of the event is preserved. The Dallas area rules admitted the difficulty of no-loophole definition of "solid stick" and "no bracing" and fostered competition between fully braced, rolled tube models and "conventional" Easy B's. As a result, the Cat. I record for paper covered Easy B is held by an unbraced model - 7:02 under a 20' ceiling! In Shreveport, La., braced wings were used as an aid to beginners - the wings stayed straight. In Chicago, the solid balsa prop was used with unlimited wing chord; Kokomo, Indiana, chose to use the full "Wilmington" formula as set up by Wally Miller, but prop construction was optional and paper covering was required. The site record for their 42' site is 10:48, held by Ed Hughey's "Seventeen" - with a balsa prop! When Chicago and Kokomo started inter-club competition, Chicago adopted the Kokomo formula. In the 75' Madison Street Armory, Charlie Sotich's "Diddle-Dip" (paper covered with a built-up prop) has topped 12 minutes during warm summer weather. The highest official time for "Diddle Dip" came when it won Open Easy B at the Chicago Aeronuts December contest in the Madison Street Armory. Note the all balsa prop outline, shown for those who must use an all-balsa prop.

POSTAL CONTESTS

With the advent of indoor postal meets which have now been flown, this topic becomes a regular column - perhaps this aspect of our sport will grow to keep it filled!

The Cliff Model Club of Dallas accepted the Cat. I challenge in Paper Stick and HLG from the Detroit Balsa Bugs, and a shortage of time forced the Balsa Bugs to fly it one-half at a time. The HLG results:

Dallas - Open HLG			Detroit - Open HLG	
1. Casey Hornbeck	0:23.5	1. Ned Smith	0:24.4	
2. Mike Ransom	0:22.0	2. Len Stress	0:23.4	
Dallas - Senior HLG		**Detroit - Junior HLG**		
1. Mike Fedor	0:21.6	1. A. Markiewicz	0:15.8 (0:14.9)	
2. Nickey Jones	0:20.7	2. Manczuk	0:15.8 (0:14.5)	

The Detroit site was 28' tall and smooth ceiling; the Dallas site (Arlington Rec. Hall) was 26' domed with exposed beams below 26'. Ned Smith was really a Senior flying in the Open class; Detroit had no other Seniors and Dallas Juniors had no IHLG and were all under 12.

Finally, Charlie Sotich and Bud Tenny ran an experimental postal meet in Easy B. Charlie flew in the 75' Madison Street Armory and Bud flew in the 26' Arlington Rec. Hall. A "fudge factor" was used to equalize the ceiling height differences thus: take the square root of 75/26 (= 1.7) and multiple this times the flight time for the 26' site. The results:

Bud Tenny - 6:49.1 x 1.7 = 11:36 Sotich - 10:25.6

It should be noted that this was the longest flight for my Easy B in excellent conditions; Charlie's end of the meet was conducted in cold and turbulent conditions. I really expected to be beaten by a small margin! We are planning to hold other postal meets, both in Easy B and in other events, using the $\sqrt{\text{ceiling height}}$ multiplier.

(cont. page 5)

Postal Challengers

Bud Tenny vs. members of D. C. Maxecutors in Paper Stick.

D.C. Maxecutors vs. any interested club; Rules open to agreement between clubs. However, the Maxecutors are suggesting 5 man teams combined with a point system which permits each club member to contribute to the club score. Events: Paper Stick, HLG and Easy B. However, the Maxecutor Easy B rules permit 3⅛" chord for Easy B, so this may be a stumbling block. The Maxecutor site is an aircraft hangar 38' to the beams and they prefer to challenge a similar site, but they will consider a multiplier based on the square root of ceiling height such as the Sotich-Tenny match. Contact Tom Vallee, 9136 Edmonston Rd. #304, Greenbilt, Md. 20770 for more details.

Bud Tenny vs. Jim Kagawa in Paper Stick (Santa Ana vs. Dallas NAS Drill Hall). Will have to measure the Drill hall ceiling, but the multiplier will probably be: $\sqrt{150/42} = 1.9$.

NEWS FROM AROUND THE WORLD

ILLINOIS - CHICAGO

The January Chicago Indoor Contest featured 17 contestants and temperatures in the upper 30's - no doubt these are related facts! The rubber times also felt the cold, but HLG times held up well. The winners: Jr. HLG - 1:29.3, Jim Thornberry; Open HLG - 2:04.8, Bob Larsh (Two flight totals); Jr. Easy B - 9:16.6, George Bucic, Jr.; Open Easy B - 9:07.5, Charlie Sotich; Open Paper Stick - 15:08, Charlie Sotich; Novice Event (Nickel Glider) - 0:07.0, Jim Fornary.

The next Chicago meet will be the 8th Annual Chicago Aeronuts Indoor Contest on Feb. 27, 1965. Events will be IHLG, Easy B, Paper Stick and Indoor Stick. Juniors will have a separate class in IHLG and Easy B, the other events are Open only.

INDIANA - KOKOMO

The January meet was "snowed out," so the next Kokomo Aero Team indoor contest will be Feb. 21 at Bunker Hill AFB. Contact Chuck Borneman for events at 1401 West Taylor, Kokomo, Ind. 46901.

MASSACHUSETTS - M.I.T.

The Tech Model Aircrafters continue to have interesting sessions once a month in the MIT Armory, even though no regular contests are held. Drop by on Feb. 20 for the next session - contact Jon Wexler, 362 Memorial Dr., Cambridge, Mass. 02139 for more details.

MICHIGAN - DETROIT

The Detroit Balsa Bugs will hold two indoor sessions in February - a general flying session on Feb. 12 and a Paper Stick Contest on Feb. 26. Contact Pat Green, 16880 Woodbine, Detroit, Mich. 48219 for more details.

PENNSYLVANIA - PITTSBURGH

Ron Ganser has secured the Stadium Gymnasium at the University of Pittsburgh (40' ceiling, 80' x 120' floor) for IHLG and Prefabs. The meet is slanted toward the younger fliers, with age groups similar to those set up for the Great Lakes meet in Cleveland. The sponsors are the Penn Hills (Pittsburgh) YMCA and the Allegheny Model Aeronautics Council. Contact Ron Ganser, 2500 Mission St., Pittsburgh, Pa. 15203 for more details.

TEXAS - FT. WORTH-DALLAS

The Cliff Model Club's Cat. I sessions have been very well attended - in fact you almost have to stand in line to fly! Top times from the three sessions so far are: Indoor Stick - 10 min. +, Jesse Shepherd; Paper Stick - 10:36, Bob Wilder (his first indoor model!); HLG - 0:27.7, Bud Tenny. All this has been in preparation for the Cat. II Drill Hall contest to be held at Dallas NAS on Feb. 21 from 9 AM to 3:30 PM. The events will be: IHLG, Indoor Stick (all classes combined), Helicopter, Towline Glider, and Indoor Scale. Contact Jerry Murphy, 1740 Sharon, Arlington, Texas for more details.

WASHINGTON D. C.

The D. C. Maxecutors continue their winning ways, and each flying session brings some higher times. The new marks are: Paper Stick - 11:28, Reggie Batterson; Easy B - 8:51, Tom Vallee; A R.O.G. - 8:43, Bill Bigge; C Stick - 12:07, Reggie Batterson; HLG - 0:38.8, Dan Belieff. The Maxecutor sessions are held in a hangar at the Washington National Airport, and they don't always have a lot of advance notice, but the next session is Feb. 13. Tom Vallee, 9136 Edmonston Rd. #304, Greenbilt, Md., will have the latest word.

HINTS AND KINKS

Condenser Paper Hint

Charlie Sotich passes on this covering method by Tom Stone: "Tom covers his wings flat and then puts in the dihedral. He then slits the tissue along the dihedral break and tacks down the overlapping tissue with his covering adhesive. I tried this on an Easy B and two Paper Stick models and it is an easy way to cover and the job is neater."

Shock Absorbers?

Charlie Sotich's indoor boxes get an easier ride than most - he cements strips of sponge rubber on the bottom to absorb extra bumps and jolts.

Tissue Patches

Kingsley Kau, a noted West Coast Indoor Scale flier, made this suggestion in the N.A.A. FLIGHTMATERS FLYING SCALE NEWS AND VIEW: "To repair small rips in condenser tissue, try plastic cement. It causes less shrinkage than regular balsa cement."

RECORDS? MAYBE!

S.H.O.C. INDOOR RECORD TRIALS - Jan. 10, 1965
Cat. III, Santa Ana MCAF, 180' ceiling
Open HLG - 1:22.2 + 1:25.2 = 2:47.4, Lee Hines

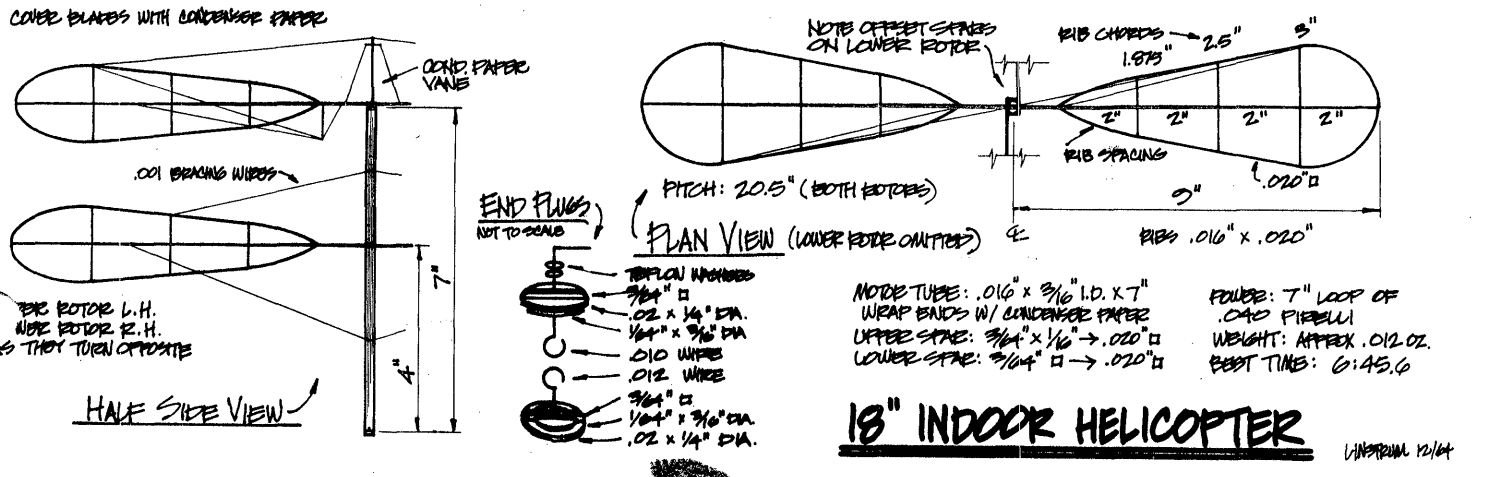
CHICAGO AERONUTS INDOOR CONTEST - Jan. 30, 1965
Cat. II, Madison St. Armory Drill Hall, 75' ceiling.
Junior HLG - 0:46.9 + 0:42.4 = 1:29.3, Jim Thornberry
Open HLG - 1:00.6 + 1:04.2 = 2:04.8, Bob Larsh

ANN ARBOR AIRFOILERS RECORD TRIALS - Jan. 22, 1965
Cat. I, Tappan (?) High School Gym, Ann Arbor, Mich. 20' ceiling.
Senior Autogyro - 2:40.5, Ned Smith

GREAT LAKES INDOOR AIR MEET - Jan. 3, 1965
Cat. II, Cleveland Public Hall, 80' ceiling.
Open Autogyro - 3:54, Ken Johnson
Open Ornithopter - 3:46.3, Ron Ganser

CHANGE OF PACE

The helicopter shown below was designed by Ned Smith and holds the Cat. III Senior record. The model is similar to Bill Bigge's record helicopter which held the Cat. III Open record for some time.



HALF SIDE VIEW

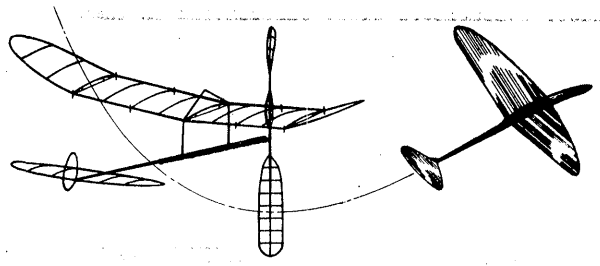
PORT ROTOR L.H.
STBD ROTOR R.H.
AS THEY TURN OPPOSITE

18" INDOOR HELICOPTER

WINSTROM 12/64

The Voice of N.I.M.A.S. MAR ·1965

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

LEO NORTHRUP, RFD #1, Shawano, Wisconsin 54166
CHUCK SLUSARCZYK, 3420 Scranton, Cleveland, Ohio
EMIL P. UHOR, 844 Clifton Street, Follansbee, W. Va.

NIMAS Awards

The first NIMAS member to apply for a NIMAS Award is Ned Smith, who qualified for Cat. I Silver Award in HLG. His flight was 0:24.4 in the 28' gym in Detroit which is used by the Detroit Balsa Bugs for their sessions. Ned will receive a special certificate suitable for framing as soon as the certificates are printed.

NIMAS Awards are awarded to NIMAS members who make flights meeting the following conditions: The model and the circumstances of the flight must conform to current AMA regulations and must be witnessed by the CD of the meet. The flight may be made at a non-sanctioned flying session provided the flight is witnessed by an AMA CD and two AMA members. It should be noted that official flights at sanctioned contests automatically meet these requirements, since the CD's report implies appropriate verification - but you still have to apply for the award! ward application forms will be ready within ten days - nd for yours now. The flight times which qualify are:

Indoor Stick (Any class indoor model; single flight)

AWARD	Cat. I	Cat. II	Cat. III
Silver	10:00	20:00	28:00
Gold	12:30	25:00	35:00
Diamond	15:00	30:00	42:00

Indoor HLG (Best single flight of nine)

AWARD	Cat. I	Cat. II	Cat. III
Silver	0:24	0:45	0:55
Gold	0:30	0:55	1:05
Diamond	0:36	1:05	1:15

Advisory Committee

When NIMAS was formed, policy matters were decided by the charter members; in recent years there has been a need for additional ideas and suggestions to improve and update NIMAS. Several people have made suggestions which are now incorporated in NIMAS to good effect; this led to the formation of a NIMAS Advisory Committee. This group will help originate and evaluate ideas for better service to NIMAS membership, publicity for Indoor, and promotion of Junior and sub-teen activity. The committee presently consists of Pete and Charlie Sotich and Dick Black; if you get any idea (no matter how far out it seems to you) send it to us for evaluation. One NIMAS member suggested that movie theaters could hold Saturday morning contests and award the winner a ticket to the matinee. Why not - for years the only active site in part of New Zealand was a movie theater! If you don't have ideas, how about some help with paperwork or other things?

Spread The Word!

In addition to considerable planning and work toward a national program of promotion for indoor flying, Reggie atterson has been promoting local activity also. After setting up demonstrations at the Richmond (Va.) YMCA, he arranged for the demonstrations to be covered by a local newspaper and got good coverage (including 2 pictures) in the Sunday issue.

Meanwhile, Ron Ganser and the Allegheny Model Aeronautics Council have continued to arrange for news coverage of all types of models - including live TV programs.

The two examples cited above illustrate what can be done by anyone willing to devote some time to creating publicity for our hobby. In months to come we may have a pamphlet to guide you in contacting news media and planning publicity campaigns; meanwhile, any story you get released should mention both NIMAS and AMA to show a tie-in with national organizations.

NIMAS Letterhead

Below you see a sample of the new NIMAS letterhead designed by Dave Linstrum. Why a letterhead after four years without needing one? The time is approaching when we will want to contact various organizations for help and/or sponsorship for indoor activities (think BIG!), and a letterhead will (hopefully) aid our cause. Also on tap: official news releases to home-town newspapers of NIMAS Award recipients.

NIMAS
National Indoor Model Airplane Society
BOX 545 RICHARDSON, TEXAS 75081 U.S.A.

Recent Publications!

Whenever an article or news item about our hobby is printed in one of the regular model magazines, we should drop a letter of thanks to the editor (or to the writer, c/o the magazine in case of a regular column) so they will know we are getting the message. As I said before, if we don't, they will print RC or U/C or something else! INAV meets a need, but these magazines reach thousands of people and give us valuable publicity. So fire up your pens - a post card is sufficient - but do it now!

Anyhow - don't miss Walt Mooney's series of indoor/outdoor scale jobs in M.A.N. (Feb., March, April '65); Dick Black's VTO column (each issue of M.A.N.) and Larry Conover's "No Strings Attached" column (each issue of A.M.). We appreciate Larry's nice write-up on INAV and Indoor in the March/April '65 A.M.

Indoor Films

As announced some time back, Joe Poloso took 16 mm. movies of indoor flying at the last Lakehurst session that was held. He then printed an extra copy and gave it to NIMAS. It was made available to clubs who wished to show it, and so far it has been viewed by two clubs. It came back in fine shape and made the rounds of some local clubs; now it is available for other clubs to view again. If you are interested in showing the film, drop a line to arrange the time you want it, pay the postage from here to there and back, and you may show it.

More On Dacron

There is still plenty of monofilament dacron for anyone who wishes to try it for bracing - if you would like some, send a stamped, self-addressed envelope to Box 545, Richardson, Texas and I'll send a sample. To those who wonder about the small "special offering" envelopes the dacron is packed in, they were discarded when my church enlarged the budget to cover special offering items. Since I was Stewardship Chairman, I was left with a box of envelopes - now I've found a use for them!

FAI INDOOR REPORT

To Protest Or Not?

The Feb. '64 INAV reported on a petition presented to AMA by East Coast indoor fliers; the text of the petition was as follows:

"As FAI Indoor competitors it is our contention that there should be a method of appeal of FAI Chairman's decision and prompt action taken before the next calendar event negates such decision.

In past years there have been protests that have remained unanswered or action has been taken too late to be of any help to the persons involved. The protests involved in the Eastern 1962 and the Mid-Western 1963 FAI flyoffs are points in question.

We therefore suggest that AMA adopt a judicial procedure to hand down a decision within ten days of receipt of protest. Such prompt action is required to enable benefitting contestant to properly prepare for the next elimination date."

An additional suggestion outlining a sample procedure was sent to HQ; a brief summary follows: Plaintiff shall notify CD of protest within 36 hours, plaintiff and CD must present their stories to HQ via Air Mail Special delivery within 72 hours after CD is notified, decision to be made by AMA Technical Director (decision must be reviewed by AMA President and Executive Director within time limit) and returned to all parties involved within (postmark) 10 days of receipt of protest.

I have supported this measure from its inception and have corresponded heavily regarding it. My most recent correspondence has been to try to find out what happened to the matter. Just before deadline for this issue, John Worth indicated that the proposal is now in the final stages of official action by the contest boards. Now we must hope that the proposal is accepted with no more than minor modification - it was well conceived and planned with adequate safeguards. Certainly the present protest machinery is inadequate to the task - one is very lucky if a decision is made within six months.

Special Announcement!!

Due to the extremely short deadline between the official announcement of the FAI Indoor Team Selection Program (March '65 Model Aviation) and the April 30 cut-off for local qualifying meets, John Worth has asked me to announce that local qualification meets only may be sanctioned directly through AMA HQ. All other meets must go through the District Contest Coordinator as usual.

Special emphasis should also be given to one other matter - your FAI stamp. You must have the stamp now, or purchase it at the local qualification meet before you can enter - any FAI qualification event for that matter. This is as it should be - the money is needed to support the FAI program so that the program can be continued without using an excess of regular AMA funds.

Local Qualification Trials Scheduled

EASTERN ZONE

Lakehurst, New Jersey - Tuesday, April 27, 1965
C. V. Russo, 143 Willow Way, Clark, New Jersey

Washington, D. C. - date not established
Tom Vallee, 9136 Edmonston Rd. #304, Greenbelt, Md.

NORTH CENTRAL ZONE

Detroit, Michigan - date not established
Paul Crowley, 32604 Tecla Dr., Warren, Michigan

Chicago, Illinois - April 10, 1965 (pending approval)
Pete Sotich, 3851 West 62nd. Place, Chicago, Ill.

SOUTH CENTRAL ZONE

Dallas, Texas - March 28, 1965
Wally Staat, 815 Wisteria Way, Richardson, Texas

WESTERN ZONE

Santa Ana, California - April 11, 1965
Bruce Paton, 1010 N. Mirasol, Santa Ana, Calif.

Moffet Hangar - April 18, 1965 (pending approval)
Joe Bilgri, 1255 Blackfield Dr., Santa Clara, Calif.

INDOOR RULES

Record Trial Attendance Proposal

This proposal, outlined in the Jan. '65 INAV, was tabled temporarily at the request of AMA Executive Director pending receipt of information on similar proposals in other events.

Indoor Proposals Studied

The Indoor Rules Committee has a group of proposals under study; these proposals grew out of the Rules Questionaire circulated by AMA last year plus an intensive study of existing rules and practices within our hobby. Some of these proposals are:

Change Section 10, Par. 10.4 to read:

10.4 HAND-LAUNCHED. A glider is hand-launched when it is thrown into flight directly from the hand of the launcher. The glider shall not be launched from an altitude greater than the flier's normal reach above the floor, and the launch shall be made with sufficient force to cause the glider to gain a substantial amount of altitude.

Note: This HLG proposal was first suggested by Bob Hatschek, but no one followed through on it. It is meant to replace the newly adopted and unnecessarily restrictive "solid wood" proposal as a means to eliminate "mike" gliders which cannot be thrown. If it seems acceptable, it would not be necessary to adopt the 0.1 oz. rule which is favored by most NIMAS members; thus we would avoid the precedent of requiring indoor models to be weighed. If you like this proposal (or if you don't), drop a line and say so!

Change Section 4, Par. 4.7 to read:

4.7 PREPARATION FOR FLIGHT. The flier or proxy flier must start and regulate the engine of free flight and radio control models, wind the motor of all rubber models except indoor models, and operate the launching apparatus of gliders. The flier or proxy flier of an indoor rubber model must either hold the model or wind the motor; auxiliary winding devices which facilitate one-man winding are permitted if operated by the flier. Motors of control line models may be started and regulated by an assistant.

INDOOR FLYING SCALE

The Case For The Small Model

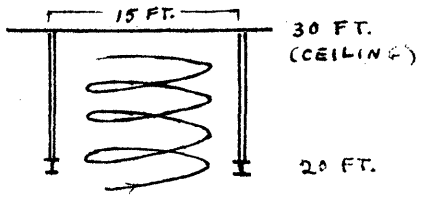
by Fred Weitzel

The local armory here has a 30' ceiling with girders 20' high and 15' apart. This adds up to an impressive maze of girders and their supporting structures. It soon became apparent that to try to fly a scale job through it all (or in spite of it) just wasn't practical. The "bounce" - recovery from upset - of most scale jobs isn't really good enough; so it was decided to limit the climb and fly beneath the beams.

This didn't work out any too well, either. To get any time with the 24" span model being used, reduced power was necessary - which made the model unstable. The adjustment ranged from difficult to impossible. Better results were obtained from a smaller model (18" span) - it was stable on minimum power but couldn't realize its real potential duration.

Finally, a still smaller one - 15" span - was called on. It could be flown in a small enough circle to fly between the girders (see sketch below), and thus there was no need to limit the climb. The climb on moderately strong power turned out to be just short of the ceiling. The model kept its small circle during cruise and descent and landed unscathed. It had made a complete "all-out" flight without interruption or contact with obstacles. A few more tries showed that the pattern could be repeated consistently - all you had to do was to launch from the right spot. (Anybody got a piece of chalk?)

So, the very small model proved to be the answer to "How to fly scale" in this limited site. The model in question is a Fairchild 22, although the particular design used probably doesn't matter as long as the model can make a small enough circle without too much sacrifice in efficiency.



POSTAL CONTESTS!

Bud Tenny vs D. C. Maxecutors - Indoor HLG
(The Maxecutors were using '64 rules and didn't send times for second best flight)

Bud Tenny
0:31.0 + 0:31.0 = 1:02

Reggie Batterson	0:37.0
Dan Belieff	0:36.8
Bob Randolph	0:35.0
Tom Vallee	0:34.6

Bud Tenny vs. Jon Wexler (M.I.T.) - Indoor HLG

Bud - 1:02 Jon - 1:05.8

Dallas vs. Kokomo Aero Team - Paper Stick

Bob Wilder	10:12.4	Bernard Boehm	7:16.1
Bud Tenny	9:02.0	Chuck Borneman	6:28.0
Jim Clem	8:40.5		

(Easy B times - no paper stick entrants due to bad weather)

Dallas vs. Kokomo Aero Team - Indoor HLG

Don Chancey	1:08.1	Bob Larsh	1:20.6
Bud Tenny	1:02.0	Bernard Boehm	1:18.0

Dallas vs. Chicago - Paper Stick

Due to different ceiling heights, a "fudge factor" was used: 75'/42' = 1.34.

Bob Wilder
10:12.4 (1.34) = 13:38
Bud Tenny
9:02 (1.34) = 12:05
Jim Clem
8:40.5 (1.34) = 11:36

Tom Stone	15:24.9
George Bucic	13:03.5
Bob Yurkowski	11:08.1

Bud Tenny vs. Jim Kagawa - Paper Stick (150'/42' = 1.9)

Bud - 9:02 (1.9) = 17:11 Jim - 11:13.5
(I didn't really beat Jim that bad - his time was on half turns, and his model was wrecked before he could take another flight)

RECORDS? MAYBE!

CLIFF MODEL CLUB ANNUAL INDOOR MEET - Feb. 21, 1965
Cat. II, Drill Hall at Dallas N.A.S., 42' ceiling
Senior HLG - 0:34.3 + 0:33.8 = 1:08.1
Don Chancey

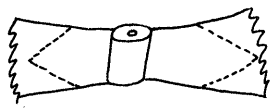
In the future, HLG records will be recorded as two flight totals with no mention of individual flights, to conform to AMA practice. For those who wondered about the 64:10 FAI record listed in the Feb. '65 M.A., it was a two-flight total. I have been assured that this was spelled out in the FAI Rules, but I don't see it. The contest scoring is called out for a two flight total, but all mention I have seen of the international record has been a single flight listing.

JUNIOR HINTS

Just as the HINTS AND KINKS column is intended to be a source of ideas on how we can build our models easier or better or faster, this column will be a source of ideas for the harassed counselor or Leader Member who has decided to teach basic indoor to a group of young Juniors. The hints presented here should outline a way of doing things within the range of skill possessed by the average youngster - the goal should be a more easily built model which will fly better. The emphasis is to get a workable model airborne within the "attention span" of the youngster - once they have a working model, they will have greater incentive to improve the next one.

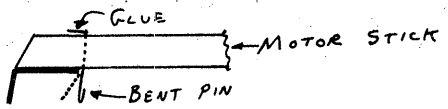
Composite Prop

The plastic props found in small rubber model kits are pretty good, but most of them are short on diameter and long on weight. If the blades are cut off close to the hub as shown below (scissors will work on most props) and a new balsa blade is glued to the bottom of the old blade, a lighter and more efficient prop will result. Kids can do it all - just make them balance the "stub" on a pin before and after the new blades are attached.



Double Bearing

Most of the smaller rubber powered ROG type kits will benefit from the addition of a double thrust bearing - the flight pattern can more easily be trimmed to small sites by using side thrust working against rudder trim. Remove the head of a straight pin, bend a hook in it, and push it through the motor stick as shown below. A right angle bend on top gives something to glue down so it will stay put. Bend it right or left for side thrust - bend it forward (dotted line) to give down thrust.



NEWS FROM AROUND THE WORLD

ILLINOIS - CHICAGO
Twenty-four contestants from four states entered the 8th Annual Chicago Aeronuts Indoor Contest. With 56° temperatures and moderate drift, the winning times were: Jr. HLG - 1:39.5, Randy Richmond; Open HLG - 1:56.2, Tom Stone; Jr. Easy B - 7:52.2, George Bucic; Open Easy B - 11:13.1, Charlie Sotich; Paper Stick - 15:24.9, Tom Stone; Indoor Stick - 20:21.7, Charlie Sotich. The next Chicago indoor meet will be April 3; Novice event - Pre-fab, Jr. events - HLG and Easy B, Open events - HLG, Paper Stick and Indoor Stick.

INDIANA - KOKOMO
The Kokomo Aero Team's February meet was "halfway" snowed out - second in a row. Sure has been a bad winter for indoor meets! Bernard Boehm won Easy B with 7:16.1 and tied ('64 rules) with Bob Larsh in HLG at 0:41.0. The tie-breaking second flight by Bob won it - (0:39.6 vs. 0:37.0 for Bernard). The next contest is set for March 21 at Bunker Hill AFB - better luck next time!

MICHIGAN - ANN ARBOR
The Ann Arbor Airfoilers have also been goofed by the weather - their Feb. 26 meet was snowed out! They plan the next one for March 19, with Easy B and HLG - separate events for Jr. and Open. Contact Dick Black, 1313 Covington, Ann Arbor, Michigan for more details.

MISSOURI - ST. LOUIS
The McDonnell club is following through on their very active season with big contest (trophies through three places) on March 28, 1965. Jr. Events - HLG and Easy B; Sr.-Open Events - HLG, Easy B, Paper Stick, Indoor Stick. The site is the Washington University Field House, time 9:00 AM to 5:00 PM. CD - Art Frost, 4944 Geraldine St., St. Louis, Mo. 63115.

PENNSYLVANIA - PITTSBURGH
Sixty-three contestants made over 500 official flights at the University of Pittsburgh Stadium Gymnasium in the first annual Allegheny County Indoor Air Meet. This meet is patterned after the Great Lakes Indoor Air Meet, and should do a lot to help both indoor and outdoor modeling. The fellows in Pittsburgh worked hard on this one, and justly deserve a lot of credit for the success of this meet.

TEXAS - FT. WORTH-DALLAS
The Cliff Model Club's Annual Indoor Contest was a rousing success - there were more entries than at any previous indoor contest ever held in the Dallas area except for the Nats. The glider end of the building was turbulent enough to cause gliders to spin down, and times showed it. In spite of the turbulence the Stick times were higher than at previous meets, but mike ships were unable stand the gaff - the top three times were Paper Stick models. The top times: HLG - 1:08.1, Don Chancey; Indoor Stick - 10:12.4, Bob Wilder; Tow Line Glider - 0:57.2, Mike Ransom; Indoor Scale - 0:37.5 (73.1 points), Casey Hornbeck; Helicopter - 4:52, Casey Hornbeck.
The rousing success of the Drill Hall meet and the continued success of the Cat. I sessions encouraged the CMC to schedule a Cat. I meet for April 4 at the Arlington site, 1 PM to 8 PM. Events will be Indoor Stick, HLG and Scale. Jerry Murphy, 1740 Sharon, Arlington, Texas.

WASHINGTON, D. C.
The D. C. Maxecutors are virtually certain of having an excellent 32' site for their April 11 contest. The events they plan are: HLG, Indoor Stick (limited to Class B models, both mike and paper) and Indoor Scale. Contact J. Harris, Box 282c, Route 1, Harding Rd., Laurel, Md. for final site details.

FUN MODELS

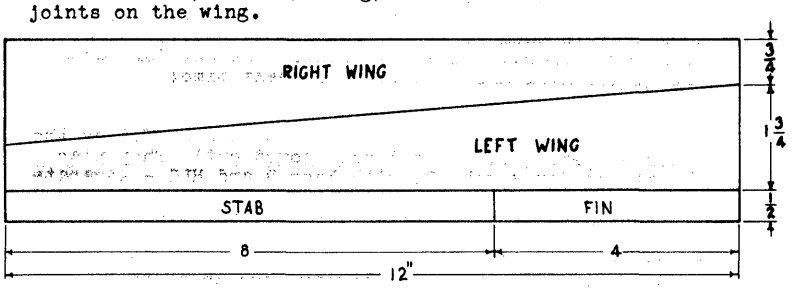
Even though most of us take our indoor models pretty seriously, there are times when it is fun to tackle some off-beat projects. This column will report on some of these projects; if you're looking for an ice-breaker for potential indoor fliers, here is a source of material.

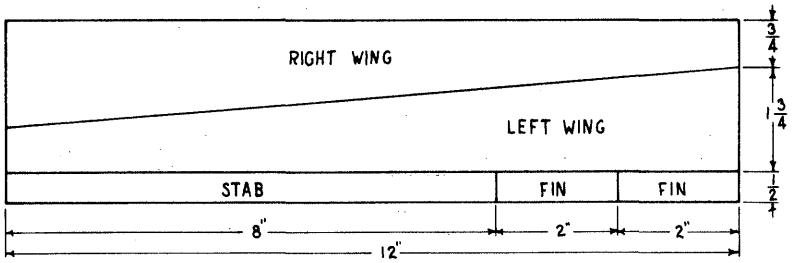
The Limited Model

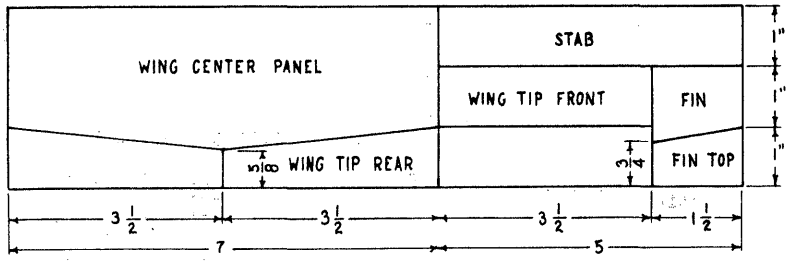
This project originated with the Tech Model Aircrafters of M.I.T. and the info was furnished by The Lone Renger (Larry Renger) and Jon Wexler. The contestant is furnished one piece of 1/32" sheet, 12" x 3", one piece of 1/8" x 1/4" balsa 12" long, a 6" plastic prop with wire to fit, aluminum tubing to fit the wire, thread, glue and lots of encouragement. The sketches below show several different designs which have been successful, but there is room for many more ideas!

Jon Wexler says this about his design: "Due to turning problems encountered with large span, high aspect ratio wings shown above mine, I looked into shorter, stubbier wings. As far as assembly goes, this is a poor design - too many little bits and pieces. However, this plane has done 2:36.4 in the MIT Armory and is now the record holder. The shorter wing does turn much better."

Other hints: The best commercial plastic prop is by North Pacific - they sell 2 for 15¢. The props should be balanced and the blades thinned until it weighs about one gram. One very effective method of trim is to heat the prop hub and warp in more pitch. Note that the 1/8" x 1/4" motor stick can be sliced into smaller pieces and parts of the remains can be used for tail boom, mounting for the tube (thrust bearing) and even ribs at dihedral joints on the wing.







"FUN MODELS" THE MODELER IS LIMITED TO: $\frac{1}{32}$X3X12 AND $\frac{1}{8}$X$\frac{1}{4}$X12" BALSA AND A 6" PLASTIC PROP. WIRE, TUBING, THREAD, ETC. MAY BE UTILIZED. THREE SUCESSFUL DESIGNS ARE SKETCHED. LIGHT WEIGHT IS CRITICAL FOR LONG FLIGHTS. THIN TAIL SURFACES AND PARTS OF WING TO $\frac{1}{64}$ OR LESS. DO NOT THIN WING LEADING EDGE MUCH. CHAMBER IS BENT INTO WINGS AND HELD WITH RIBS. LOWER ASPECT RATIO DESIGNS CIRCLE BETTER. PROPS CAN ALSO BE LIGHTENED AND PITCH INCREASED BY TWISTING HEATED BLADES.

A LOOK AT YESTERYEAR

1938 NATS RESULTS

Junior Indoor Stick

Edward Domohowski	15:08.2
Arthur Beckington	12:27.2
Mike Gajdos	9:41.0
W. Newlin Hewson	8:16.0
Wilfred Bobier	6:19.2

Senior Indoor Stick

Hewitt Phillips	21:53.8
Milt Huguelet	21:06.0
Walter Lees	20:34.2
Charles Belsky	20:03.2
Harry Dolfi	18:30

Open Indoor Stick

Carl Goldberg	19:11.6
Thomas Hanis	18:42.2
Ed Fulmer	18:14.0
Alvin Gaskill, Jr.	16:50.8
Bruno Marchi	16:39.9

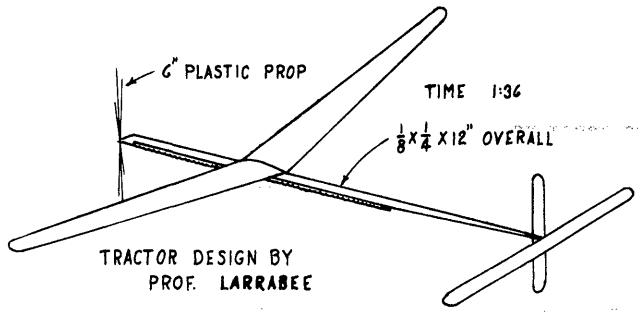
Senior Cabin

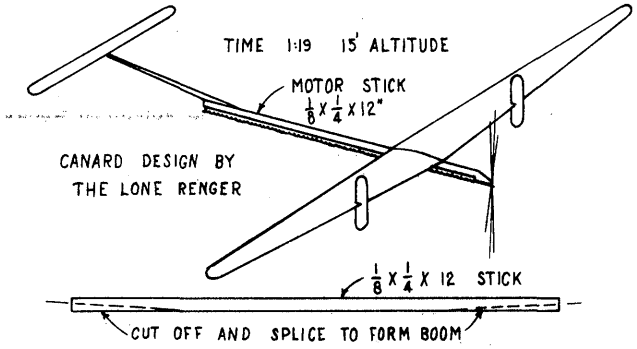
Milt Huguelet	13:50.0
James Cahill	13:00.4
John Stokes, Jr.	12:42.0
Charles Belsky	12:35.0
Richard Obarski	12:33.8

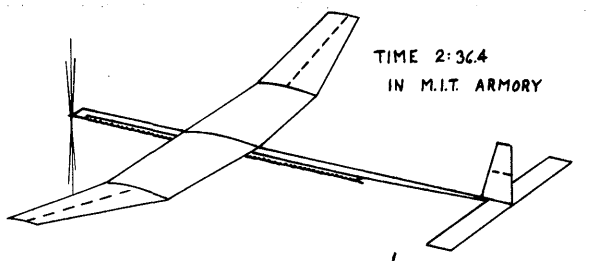
Open Cabin

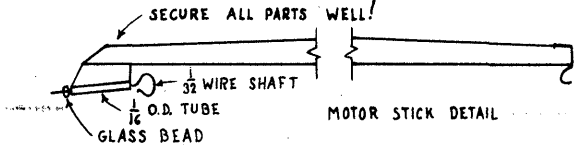
Henry Struck	16:01.0
Bruno Marchi	12:22.2
James Matulis	12:01.8
Curtis Janke	11:15.2
Ed Fulmer	9:52.8

The above results came from "The National Model Airplane Meet in Pictures," published by Frank Zaic. Many thanks to Frank for making this information available.







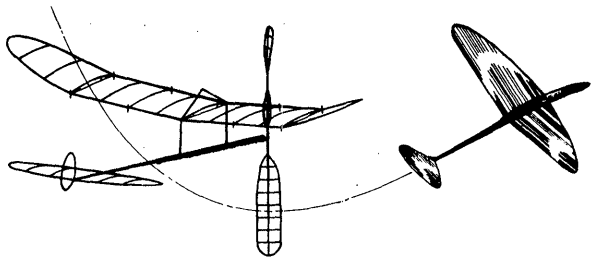


DRAWN BY
C Mather
12-26-64

Mar 65

The Voice of N.I.M.A.S. APR ·1965

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

EDWARD BESHAR, 10 Ridge Place, Pelham, N. Y. 10800
MIKE RANSOM, 207 West Abrams, Arlington, Texas
HARUTO SHIMAZU, 18 North T Avenue, National City, Calif.
FUDO TAKAGI, 2168 Newton Ave., San Diego 13, Calif.

NIMAS Awards

Application forms are being processed for the following NIMAS Awards:

Cat. I Silver HLG Award

Larry Renger	0:27.5	Bud Tenny	0:27.2
Ed Collins	0:25.2	Hal Blubaugh	0:25.3

Cat. I Silver Rubber Award

Bud Tenny	11:59	Ed Collins	11:05.6
Jim Clem	11:05.6	H. Blubaugh	10:59.6
Eric Vogel	10:17		

Spread The Word!

When Bob Clemens moved to Rochester, N. Y., he noted a 23' smooth ceiling gym in his office building (he works for Kodak) but had no time to do anything about it. When he did set up a flying demonstration there recently, he went "whole hog" and had the event covered by the company newspaper. When this comes out, approximately 32,000 Kodak employees will read about indoor and see pictures of models in flight. So, there's another idea for us to try out - company newsletters are anxious for news of employee activities - expecially those unusual ones such as flying indoor models!

Another Reader Writes!

Dear Bud,

Here's a sneaky technique for increasing glider stability.

As you know, wing tips give off vortices which rotate in on the top, out on the bottom. These vortices cancel out to a pure downward component on the centerline of the model.

By making tip plates angled toward the rear of the model it is possible to FOCUS the vortices onto the tail surfaces. If you raise the vertical fin well above the centerline of the wing you can see that the air velocity pattern will always try to center the fin in the cancelling area of the vortices.

If the model is built as suggested, when the model is disturbed from its normal path, the rudder is re-centered by vortices SET UP PRIOR TO THE DISTURBANCE! Thus it not only re-stabilizes the model, but returns it to its original flight path.

Sincerely,
Loof Lirpa

FAI INDOOR REPORT

FAI Indoor Chairman Appointed

A memo from John Worth to the FAI Indoor Committee dated March 31, 1965, reminded the committee that its official status ended with the start of the team selection program and the appointment of an FAI Indoor Chairman to oversee the program. This change in procedure was spelled out by the 1964 Executive Council, with the stipulation that the Chairman would not be a competitor in the program he is administering.

The appointee is Tom Finch, and there is no doubt of Tom's qualifications for the post. Although Tom volunteered for the job, he was recommended by members of the FAI Indoor Committee and by AMA HQ.

Tom has already assumed command of the program and requested that the members of the FAI Indoor Committee assume responsibility for coordinating the team selection events in their own areas. He has requested that all such arrangements be completed by May 1, so if you are involved in the set-up of the team selection program as a CD, please coordinate your planning with the member of the FAI Indoor Committee for your Zone. A listing of their addresses appear in the Feb. '65 INAV and the March '65 Model Aviation.

FAI Protests - A Second Look

Last month I indicated I had been informed that the Ten Day Protest Procedure was in the final stages of official action by the contest boards. On page 4 of the April '65 Model Aviation you will find the text of the resulting proposal. This is the required first printing of a new proposal - which places it a minimum of three months away from acceptance or rejection by the contest boards. To offset the late schedule of this proposal, an announcement indicates the proposal will be used in the interim "where applicable until and unless superceded by final vote changes."

If you study the proposal, you will find it a large improvement over the existing procedure - in fact, it may well be a very fine means of dealing with AMA protests in spite of the lack of resemblance to the petition which initiated the action.

However, there are some facets of this proposal which (in my opinion) render it unfit for dealing with FAI protests - which leaves us right where we were two years ago! Specifically, I object to the use of volunteer officials to handle appeals, and I object to the one hour limit for filing the original protest.

To start with, the one hour time limit for filing may work a hardship on FAI entrants who have a long distance to travel and must leave at the end of their flights. If an irregularity comes up after they leave, they have no recourse in the case of the one hour limit. Since there is provision made for "protests apart from the conduct of a contest" to be made within a three day limit, why not a three day limit for all protests to be filed? The one hour limit makes good sense for AMA meets which are over and done with that day, but FAI team selection programs go on for months!

The matter of using volunteer officials would be fine except that this nullifies (possibly) the three day time limit established in Par. 1.23.1 for answer of appeal, besides the chance of never receiving an answer. Most of the elected and appointed AMA officials are dedicated and hard working people, fully capable of handling AMA business in the best possible manner - just as it should be. However, there are no provisions for the rare cases when such officials neglect their duties - at least once in recent years an AMA official neglected his duties and was re-elected to another term to repeat the act! There are no provisions for the key AMA official to appoint an alternate to handle his business in case he is sent out out of town on company business - or for personal reasons for that matter. What is such a man to do? He receives no pay from AMA and his livelihood comes first. If he has important mail forwarded, the three day limit will

have expired before he can act. For that matter, there should be a stipulation requiring Air Mail Special Delivery to be used for protest handling - from personal experience I know mail can be delayed more than three days without special handling.

The alternative is clear - have salaried AMA officials handle the protest appeal. Since we have a business office, financed with our money, we have a right to assume that such officials will make provisions for handling their business in case they are out of town. Thus, the time limit has meaning and we have a way to prevent future neglect of duties by any such official.

Team Selection Trials Schedule

Local Qualification Trials

DENVER, COLORADO - April 4, 1965 Cat. I
Ed Collins, 4318 East Utah Place, Denver, Colo. 80222
CHICAGO, ILLINOIS - April 10, 1965 Cat. II
Pete Sotich, 3851 West 62nd Place, Chicago, Ill. 60629
SANTA ANA, CALIFORNIA - April 11, 1965 Cat. III
Bruce Paton, 1010 N. Mirasol, Santa Ana, Calif.
HAMPTON, VIRGINIA - April 14, 1965 Cat. I
Bob Champine, 25 Beechwood Dr., Yorktown, Va. 23490
FT. WORTH, TEXAS - April 24, 1965 Cat. I
Jesse Shepperd, 5312 Odessa, Ft. Worth, Texas
WASHINGTON, D. C. AREA - April 25, 1965 Cat. II
Tom Vallee, 9136 Edmonston Rd. #304, Greenbelt, Md.
MOFFETT FIELD, CALIFORNIA - April 25, 1965 Cat. III
Joe Bilgri, 1255 Blackfield Dr., Santa Ana, Calif.
DETROIT, MICHIGAN - May 2, 1965 Cat. II
Paul Crowley, 32604 Tecla Dr., Warren, Michigan
LAKEHURST, NEW JERSEY - April 27, 1965 (pending)
C. V. Russo, 143 Willow Way, Clark, New Jersey

Quarter Finals

DALLAS, TEXAS - April 25, 1965 Cat. II
Wally Staat, 813 Wisteria Way, Richardson, Tex. 75080
DENVER, COLORADO (QF may be pending in April)
Ed Collins, 4318 East Utah Place, Denver, Colo. 80222
SANTA ANA, CALIFORNIA - May 9, 1965 Cat. III
Bruce Paton, 1010 N. Mirasol St., Santa Ana, Calif.
MOFFETT FIELD, CALIFORNIA, May 16, 1965 Cat. III
Joe Bilgri, 1255 Blackfield Dr., Santa Clara, Calif.
CHICAGO, ILLINOIS - May 22, 1965 Cat. II
Pete Sotich, 3851 W. 62nd Place, Chicago, Ill. 60629
DETROIT, MICHIGAN - date pending Cat. II
Paul Crowley, 32604 Tecla Dr., Warren, Michigan
LAKEHURST, NEW JERSEY - May 25, 1965 (pending)
C. V. Russo, 143 Willow Way, Clark, New Jersey

Local Qualification Trials Results

DALLAS, TEXAS - March 28, 1965 (42' ceiling)
Five entrants, four qualifiers:

Jim Clem	12:12	13:45	25:57
Bud Tenny	12:08	11:37	23:35
Eric Vogel	9:13	10:31	19:44
Nickey Jones	9:43	9:52	19:35

DENVER, COLORADO - April 4, 1965 (34' ceiling)
Four entrants, three qualifiers:

Ed Collins	10:00	9:45	19:45
Hal Blubaugh	6:20	3:23	9:43
Bob Greider	2:57	2:50	5:47

INDOOR RULES

More Proposals

The following proposal now under study by the Indoor Rules Committee resulted directly from comments made on the Indoor Rules Questionaire circulated in 1964:

Add the following to Section 8:

8.22 EASY B MODELS. The Easy B model clas has been established to encourage a transition from outdoor models to indoor type models, and as an ideal beginner indoor model. The Easy B model class shall not be eligible to set National Records (except where the model meets the specifications of another indoor model classification.)*

8.22.1 CHARACTERISTICS OF EASY B INDOOR MODELS. Easy B shall meet the following specifications:

Wing Span - The projected wing span shall not be larger than 18".
Wing Chord - The wing chord shall not be larger than 3".
Propeller - The propeller blades shall be construced entirely from wood with the following exception: Special novice or beginner events can be set up for local contests by permitting the use of plastic commercial propellers, provided advance notice is given in contest announcements.

There shall be no restrictions on covering material, but local Contest Directors may specify the covering material to be used for a given event, provided advance notice is given in contest announcements. Further restrictions on Easy B design and/or construction may be made by the Contest Director for specific events provided advance notice is given in contest announcements.

*This phrase is under discussion by the Committee.

STATE OF THE ART

This month's model won third at the '64 Nats, just one minute out of first. It can be considered to be a transitional model, since it uses high aspect ratio wing with 25% stab on traditional length stick and boom. The Nats winner lost a couple of wings and finally was hung and demolished before it could further distinguish itself in contests. Charlie built another with 12" boom which showed promise - but it met a similar fate. Either this version or the extended boom version should be a good model if you're considering a new model - the curved outlines on the tips are all parabolic developments and are easy to lay out.

POSTAL CONTESTS!

Bud Tenny vs. Jon Wexler - Indoor HLG (Cat. II)

Bud - 1:11.8 Jon - 1:21

Dallas Area (26') vs. Elmira, N. Y. (20')Fudge factor 1.3

First Meet - Cat. I HLG

Eric Vogel	0:52.3	Bob Trampenau	0:41.8(1.3)	0:54.34
Bud Tenny	0:52	Jim Mayes	0:41.2(1.3)	0:53.56

Second Meet - Cat. I HLG

Larry Renger	0:54.5	Jim Mayes	0:42.6(1.3)	0:55.38
Bud Tenny	0:54.3	Bob Trampenau	0:41.8(1.3)	0:54.34

Dallas Area vs. D. C. Maxecutors - Cat. II Paper Stick

Bob Wilder	10:12.4	Tom Vallee	9:55.0
Bud Tenny	9:02.0	Bill Bigge	8:51.8
Jim Clem	8:40.5	Bob Randolph	8:27.0

Postal Challengers

Jim Mayes and Bob Trampenau (Elmira Indoor Model Airplane Club, Elmira, N.Y., challenge any other group to Cat. I HLG, using a fudge factor equal to ratio of ceiling heights of respective sites. 1965 AMA rules.

HINTS AND KINKS

Microfilm Hint

Dick Ganslen suggested that spots of rubber cement on the hoop would help pick up big sheets of microfilm, but I went whole hog and coated the entire film area of the hoop plus the sides adjacent to that surface. I had been pouring large gold and silver sheets of very "dry" film which had been slipping on the wet hoop and tearing as I picked it up. After the rubber cement was applied, I got four sheets from four tries! Excellent hint!

JUNIOR HINTS

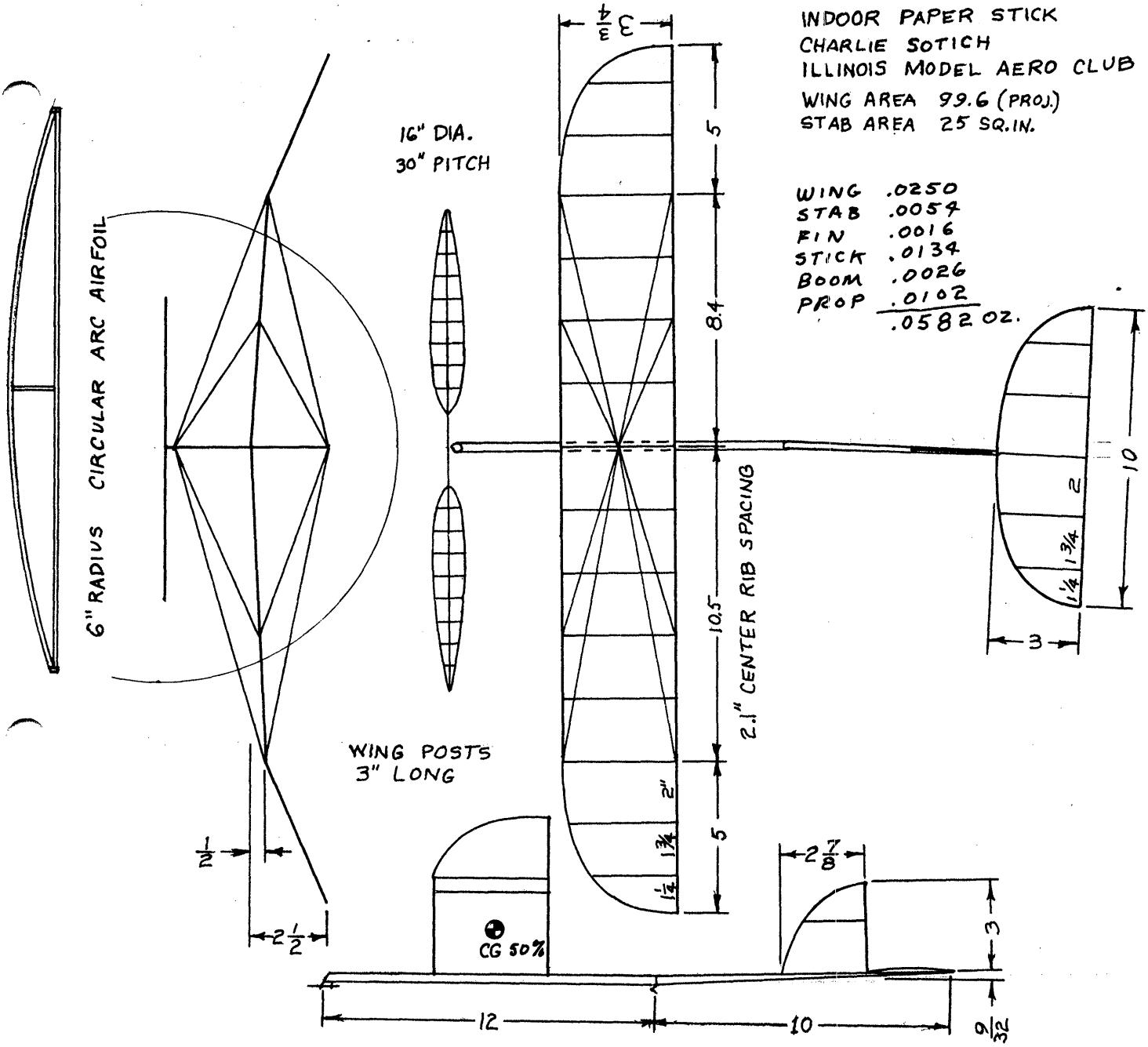
Easy Curved Ribs

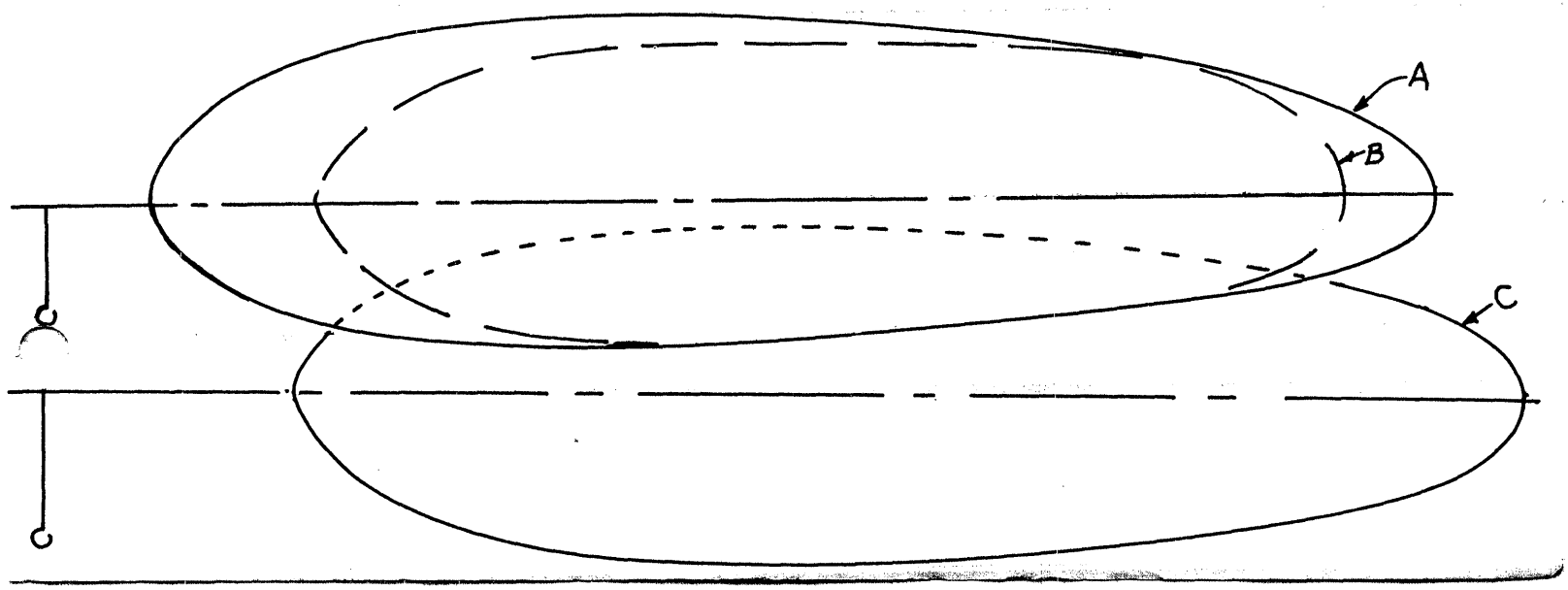
Those younger juniors who haven't developed enough coordination to slice acceptable curved ribs can still build wings with lifting airfoil. The method is to use the old time soak-bend-and-bake approach with a modern touch - arc airfoils. Most youngsters can learn to use a stripper, so have them strip 1/32" square strips and cut them into about 5" lengths and soak them in water. Select a large deep skillet about 10" in diameter, a similar pan or simply a curved piece of aluminum bent to a 5" radius arc. The wet strips are then laid out on the aluminum form and secured with Scotch Magic Mending Tape (it really sticks to wet objects like they say). Then bake the ribs in the oven at 200° for 20 minutes, or until slightly brown. The remnants of the tape can be removed with acetone or similar thinner, and the ribs can be trimmed to fit in a 3½ or 4" wing - some of the curve comes out after the wood cools, so the camber comes to about 8% - just right!

DORSAL DIP

INDOOR PAPER STICK
CHARLIE SOTICH
ILLINOIS MODEL AERO CLUB
WING AREA 99.6 (PROJ.)
STAB AREA 25 SQ.IN.

WING	.0250
STAB	.0054
FIN	.0016
STICK	.0134
BOOM	.0026
PROP	.0102
	.0582 oz.





THE LAB

Flight Testing

In the Feb. '64 INAV I proposed a fairly comprehensive flight testing program which would permit a number of evaluations of indoor model performance. Response to the idea, at least in terms of correspondence, was zero. A long-standing suspicion that the German team has spent hundreds of hours in detailed scientific testing of every facet of indoor models has been well confirmed by reading the Hacklinger thesis. So why don't we test?

In the time I have been publishing INAV, I have had many long discussions about model performance and flight characteristics. Sooner or later, each discussion bogged down - each time the difficulty was lack of agreement or lack of knowledge of the behavior of the model during each part of the flight. For example, a common assumption has been that forward speed of the model is about equal during climb, cruise and descent. I have observed models which did indeed appear to meet this stipulation, but I have also measured as much as 40% total variation in forward speed during the flight, with reason to think that some models would vary even more.

Thus, it is apparent that some flight testing will be necessary before meaningful studies of model performance can be made. I firmly believe that we have reached a plateau of performance which we will not greatly exceed without some application of scientific measurements to our testing program. I agree that we can still try a new prop and note (for example) that the average RPM is lower than before and the flight time with a given number of turns is somewhat higher. However, just what part of the flight benefitted from the change? Without being able to answer that question, it is much harder to determine what on the new prop is better; if you can't pin down where the new prop excells, how can you know how to improve the prop design?

If you need further argument that scientific testing is important, please note that FAI outdoor types (George Xenakis and Fred Pearce, to name two) and U/C fliers (Bill Netzeband, for example) are regularly making careful measurements of flight and power parameters. I believe that even the most practical indoor flier will admit that we stand to gain more (relatively speaking) than the outdoor types, and that it is easier to make the necessary observations with accuracy on indoor models.

Since we know very little about the flight profiles of our models, let's start with some simple measurements that almost anyone can make:

1. Prop RPM - count 15 revolutions against a stopwatch once each minute until cruise; once every two minutes from cruise until touchdown.
2. Flight speed - Measure or estimate flight circle diameter and altitude gained or lost for each circle of flight; time the length of each flight circle so the flight speed can be computed. This measurement must be correlated to prop RPM (start the RPM count and flight circle timing together).

The above measurements can be made by a crew of three people, and only the owner of the model needs to be an indoor flier. Appoint one crewman to be flight timer and recorder, and let one count RPM. The third man can time the circles and estimate the altitude change; however, he would have to time alternate circles since he must have time to read the watch and call out altitude change. To log every circle another timer would be necessary. The flight timer and recorder should signal the start of each measurement period and record the numbers as they are called out by the other timers.

Any site can be used which has relatively low drift; the only stipulation should be that the model is flown in such a manner as to avoid hitting the top - otherwise the cruise figures (the most important) would be distorted. If anyone is interested in this type of approach, please give it a try and let the results be known. It will take hundreds of flights to get truly definitive results, but early results can point the way to more effective tests later in the program.

NEWS FROM AROUND THE WORLD

COLORADO - DENVER

The Martin Model Masters have had their share of snow problems, but in recent weeks they have had two well attended indoor sessions - their monthly contest and the FAI local qualifications (results elsewhere). Ed Collins won Indoor Stick with 11:05.6, Bob Greider won B Paper with 8:10.4, and Bill Giesking won HLG with 0:50.8. In case you are wondering, Denver's 6000' altitude does make a difference, and these are good times for their 34' site

ILLINOIS - CHICAGO

The Madison Street Armory has been jumping with meets lately - A Cat. II meet on April 3 and Round I FAI on the following week. The FAI results are not in, but the indoor contest was hotly contested. The winners: Jr. HLG - 1:53.8, Jim Thornberry; Jr. Easy B - 8:38.0, Jim Thornberry; Open HLG - 2:04.3, Tom Stone; Open Paper Stick - 18:16.1, Wally Mumper; Open Indoor Stick - 26:29. The Chicago meet will be May 1, 1965 with Jasco ROG for a novice event, HLG & Easy B for Juniors and HLG, Paper Stick & Indoor Stick for Open contestants.

MASSACHUSETTS - M. I. T.

The M.I.T. sessions may have lacked a certain number of serious fliers, but the sessions have been lots of fun for those who attended. Jon Wexler's consistent HLG has kept certain postal opponents hopping, and Harry Lerman has been getting good times in A ROG and B Paper. The remaining sessions are April 17 and May 15, 4:30 to 8:30 PM. Contact Jon Wexler, 362 Memorial Dr., Cambridge, Mass. 02139 for confirmation and details.

MICHIGAN - DETROIT

The indoor season is getting a slow start in Detroit, at least the serious flying part of it. Between cold weather and non-availability of the State Fair Coliseum, the first major event is the State Meet on April 25, 1965 which features special events for novices besides the usual indoor events. For more details contact Ed Stoll, 7319 Marjorie, Detroit 13, Michigan.

SOUTH AFRICA - CAPE

Pat Curtis says that indoor activity has ground to a halt in South Africa - the old bugaboo of no sites shot them down. It seems they can't even find one to rent! Anyway, there are several fellows raring to go anytime there is a place to fly - wish them luck!

TEXAS - DALLAS-FT. WORTH

The "regular" indoor season ground to a halt here with the Cliff Model Club's Cat. I contest. The meet was hotly contested, with Bud Tenny winning Indoor Stick with 11:29, Larry Renger (just passing through town deliberately!) winning HLG with 0:54.5 a,d Sturgill winning Scale with 58.7 points. Other highlights: Bob Wilder's just missing the Paper Stick record twice, and Larry Renger's "Limited" making beautiful flights and converts to the idea of flying "limited". All the indoor fliers in the area really appreciate the excellent support of Indoor by the CMC - the art made great strides here this year with the many opportunities to fly made possible by the club's sponsorship.

Meanwhile, in Ft. Worth, Jess Shepperd announced his FAI Round I would be in the 24' R. D. Evans Recreation Center on April 24, the night before Round II. Contact Jess at 5312 Odessa, Ft. Worth, Texas, AX -2-1368, Area Code 817 for site location and times.

WASHINGTON, D. C.

Right at the last minute, the D. C. Maxecutors were forced to shift their Cat. I contest to the 20' smooth ceiling gym at the Suitland Senior High, 5000 Silver Rd., Suitland, Md. Although the results aren't in yet, this livewire club should produce good times in any site. The Maxecutor-sponsored FAI Round I will either be in the same site or in Hangar #9 at Andrews AFB. Everyone interested in attending please contact Tom Vallee, 9136 Edmonston Rd. #304, Greenbelt, Md. 20770 for final choice of date and for times of meet.

RECORDS? MAYBE!

DALLAS FAI LOCAL QUAL. TRIAL - March 28, 1965
Cat. II, Drill Hall at Dallas NAS, 42'ceiling.
Junior FAI - 9:13 + 10:31, 19:44, Eric Vogel
Open FAI - 12:12 + 13:45, 25:57, Jim Clem

CLIFF MODEL CLUB INDOOR CONTEST - April 4, 1965
Cat. I, Arlington Rec. Hall, 26' ceiling.
Junior C Stick - 10:17, Eric Vogel
Open FAI - 11:59 + 9:29, 21:28, Bud Tenny
Open HLG - 0:54.5, Larry Renger

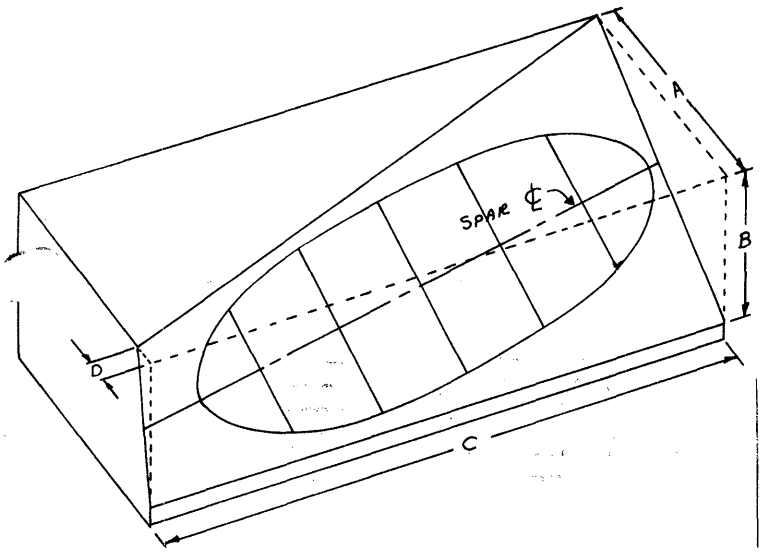
CHICAGO INDOOR CONTEST - April 3, 1965 75' Ceiling
Cat. II, Madison Street Armory, Chicago, Illinois
Junior HLG - 1:53.8, Jim Thornberry
Junior Paper Stick - 14:58.1, Jim Thornberry
Open FAI - 26:29 + 20:53, 47:22, Tom Stone

PROP FORUM/LOW POWER

In the last year and one-half I have made various reports and suggestions about using rubber weighing less than the airframe for low ceiling flying; I have also made various suggestions about increasing prop efficiency which have yet to be proved, except by inference. This report combines information about both techniques, since the prop designs presented develop more thrust per unit of input torque than do conventional props with the same blade area and blade area distribution. Thus, the props fit well into a low power test program and may well be necessary to supplement the application of low power flight techniques. Only an exhaustive and definitive prop test program is likely to yield the answers to all questions raised by this technique - as for myself, I am committed to these techniques until they are proved to be faulty. A review of my own flying results in the year I have been using this method shows a marked increase in the performance of my models - which may only prove that my application of conventional techniques was faulty.

Three prop designs are presented at the bottom of the Dorsal Dip plans and prop block info is presented below. Props "A" and "B" were built on block I, prop "C" was built on block II. The block dimensions are presented below in tabular form:

Dimension	A	B	C	D
Block I	3 3/16"	1 5/8"	7 3/4"	7/16"
Block II	3 1/4"	1 1/2"	8"	1/4"



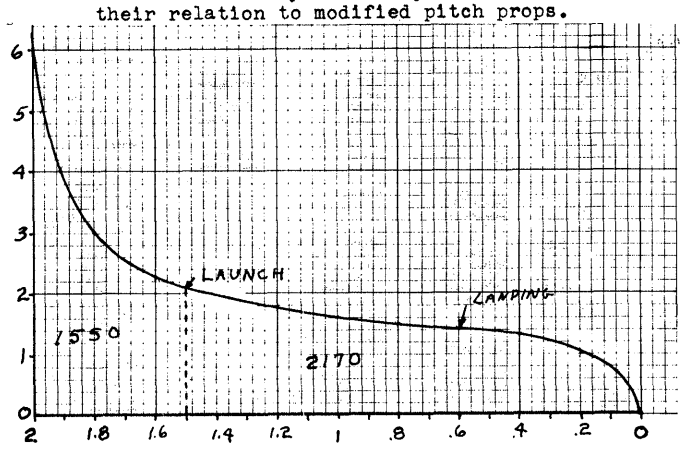
Dimension "D" in the table above is established to limit the maximum pitch angle of the blade to some arbitrary angle, assuming that the blade area near the hub on a "true pitch" prop operates partly stalled during most of the flight. Experimental flights show that this pitch adjustment reduces the torque required to turn the prop and tends to increase the average RPM. This in turn reduces the rubber cross-section required and permits an increase in the maximum number of turns possible. The table below records some flight performances of the props under discussion:

TURNS IN	TURNS OUT	TIME	RPM	RUBBER WT.	MODEL WT.
Prop "A"					
1230	495	9:32	77.5	.021 oz.	.037 oz.
1380	540	12:12	69	.021	.037
1440	390	13:45	76	.021	.037
1500	600	11:06	81	.021	.037
Max turns for this motor approx. 2000					
Prop "B"					
1290	375	11:59	76	.030 oz.	.022 oz.
990	600	6:30*	60	.027 oz.	.019 oz.
Max turns first motor approx. 2200; second motor 2500					
Prop "C"					
1380	420	12:08	79	.040 oz.	.027 oz.
1470	420	14:20	73.5	.040	.027
Max turns for this motor approx. 2500.					

*This flight made in 16' site with a smaller wing on the same model and much lower humidity.

The flights logged above were made under ideal flight conditions except for high humidity (over 80%) which made larger than normal rubber size necessary. Comparison of turns in vs. max turns shows an excess of power which could have been reduced by using smaller props and rubber with smaller cross-section. More time for experimenting would have permitted the usual technique of winding to a greater number of turns and backing off - but this calls for extensive flight testing for reliability. It should be noted also that the above rubber loops were between the limits of .030" pirelli and .037"pirelli and that a significant decrease of rubber weight is difficult to get without using rubber that comes in thinner strips than pirelli! The graph below (a typical torque curve with 2000 turns set arbitrarily equal to the abcissa) shows that with 75% of max turns installed only 57% of the maximum energy storage capability of the motor was put in; if the graph fitted that motor one could conclude that 32% of the energy installed remained at landing.

Next month - An analysis of adjustable pitch props and their relation to modified pitch props.

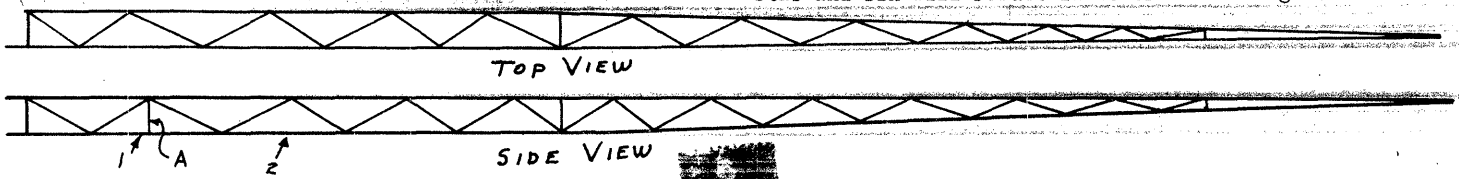


BUILT-UP BOOM COMMENTARY

The Nov. '64 INAV introduced the built-up tail boom as an experimental model component. Since then, several booms have been built and flown, giving some background of experience in both building and handling. It is clear that the built-up boom can save considerable weight over booms of similar length with equal or better handling characteristics over rolled booms.

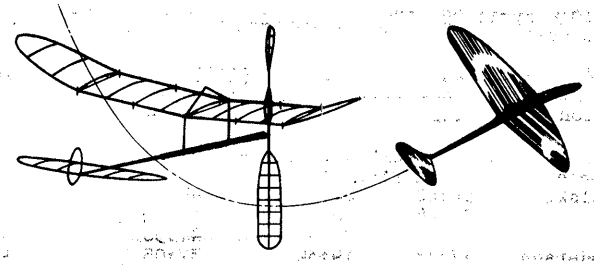
Two weaknesses have turned up - both curable with the foreknowledge of the problem. The first - torsional strength - was mentioned in the November article. The modified Warren truss construction pictured below makes a substantial improvement in torsional strength. The other problem was a stress concentration at the points marked "1" and "2" which can be cured by very light cross pieces such as "A" - one on each side. For booms up to 11" long, the longerons can be 5 lb. wood, .024" square, while the diagonals can be very thin (.016" to .020" square). Considerable time can be saved in construction if the cross pieces are all cut to the same length ahead of time. My 10½" boom weighed .002 oz.

For those who favor the Sotich type layout, this boom can be built longer for the same weight and the smaller stab and fin will result in lower model weight.



The Voice of N.I.M.A.S. MAY·1965

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

NIMAS Awards

Award applications for last month:

Cat. I Gold HLG Award - 0:33.5, Larry Renger

Cat. I Gold Rubber Award - 13:01, Clarence Mather

Cat. III Gold Rubber Award - 40:37, Joe Bilgri

Spread The Word!

The Detroit Balsa Bugs are one of the sponsors of the annual State Meet held in Detroit, and this year they set up quite a bit of publicity for the indoor part of the contest. Ed Stoll arranged for newspaper, radio and TV coverage and gave a 10 minute talk on indoor models over station WWJ. WWJ-TV tried to film some of the contest, but lighting conditions were too poor for good results. We all owe Ed a vote of thanks - although the publicity will help in the Detroit area more than elsewhere, the word will spread outward from there.

While our overt acts of publicity will help our cause quite a bit, there is a good lesson in the following bit of introspection expressed in a club newsletter. Does the following fit better than we would like?

"We failed our spectators, who were numerous and unexpected, by not setting up an information center to dispense information on Indoor Model building. Next year we must set up a display of indoor building, microfilm set-ups, and distribute plans free to these spectators to bring Indoor Model activity to a level worthy of the population our town enjoys. Many of us were curt and abrupt to the point of discourtesy in answering questions proposed by the many young boys and girls who expressed an interest in our models. We know, of course, that some of this abruptness stemmed from a desire to protect the models, but a lot of it was preoccupation with flying in many events and the struggle to get in the required flights."

1965 SOARING YEAR BOOK

Since several of our members are also glider pilots, this may not be as out of place as it sounds. Anyway, Richard Miller has announced that the 68 page SOARING YEAR BOOK is available for $2.50 from Box 77334, San Francisco, Cal. 94107. It is a beautiful presentation with quite a few articles of interest to soaring buffs.

FAI INDOOR REPORT

Team Selection Trials Schedule

Quarter Final Trials

DENVER, COLORADO - May 9, 1965 Cat. I
Ed Collins, 4318 East Utah Place, Denver, Colo. 80222
SANTA ANA, CALIFORNIA - May 9, 1965 Cat. III
Bruce Paton, 1010 N. Mirasol, Santa Ana, Calif.
MOFFETT FIELD, CALIFORNIA - May 16, 1965 Cat. III
Joe Bilgri, 1255 Blackfield Dr., Santa Clara, Calif.
CHICAGO, ILLINOIS - May 22, 1965 Cat. II
Pete Sotich, 3851 West 62nd Place, Chicago, Ill. 60629
LAKEHURST, NEW JERSEY - May 25, 1965 Cat. III
C. V. Russo, 143 Willow Way, Clark, New Jersey
WASHINGTON, D. C. AREA - May 16, 1965 Cat. II
Tom Vallee, 9136 Edmonston Rd. #304, Greenbelt, Md.
DETROIT, MICHIGAN - Date pending Cat. II
Paul Crowley, 32604 Tecla Dr., Warren, Michigan

Semi Finals

WEST COAST - June 13, 1965 Cat. III
Bruce Paton, 1010 N. Mirasol St. Santa Ana, Calif.
NORTH CENTRAL ZONE - date pending Cat. II
Paul Crowley, 32604 Tecla Dr., Warren, Michigan
SOUTH CENTRAL ZONE - June 12 or June 26, 1965 Cat. II
Bud Tenny, Box 545, Richardson, Texas
EAST COAST - June 22, 1965
C. V. Russo, 143 Willow Way, Clark, New Jersey

Qualification Trial Results

Local Trials

CHICAGO, ILLINOIS - April 10, 1965 Cat. II (75')
Six entrants, five qualifiers:

Charlie Sotich	22:52	23:26	46:18
Curtis Janke	20:49	22:27	43:16
Tom Stone	18:56	18:12	37:18
Dick Ganslen	14:32	15:22	29:54
Clarence Mills	13:43	14:50	28:33

SANTA ANA, CALIFORNIA - April 11, 1965 Cat. III (155')
Five entrants, four qualifiers:

Joe Bilgri	34:41	40:37	75:18
Bud Romak			
Warren Williams			
Bruce Paton			

HAMPTON, VIRGINIA - April 14, 1965 Cat. I (28')
Eight entrants, six qualifiers:

Hewitt Phillips	6:09	8:32	14:41
Harold Crane	5:59	5:46	11:05
Bob Champine	5:48	5:14	11:02
Woody Blanchard	5:23	5:10	10:33
A. D. Jessup	4:34	5:03	9:37
Jim Kelley	3:20	3:39	6:59

FT. WORTH, TEXAS - April 24, 1965 Cat. I (24')
Four entrants, three qualifiers:

Jess Shepperd	7:24	7:06	14:29
Mike Ransom	6:32	6:12	12:44
Bob Putnam	3:28	5:19	8:47

WASHINGTON, D. C. - April 25, 1965
Six entrants, four qualifiers:

Bill Bigge	9:40	12:38	22:18
Tom Vallee	10:44	10:21	21:05
Reggie Batterson	8:38	10:09	18:47
Bob Randolph	9:49	8:34	18:23

MOFFETT FIELD, CALIFORNIA April 25, 1965 Cat. III(180')
Four entrants, three qualifiers:

Carl Rambo	33:37	38:21	71:58
Manny Andrade	30:32	30:20	60:52
L. Parsons	No times given		

SAN DIEGO, CALIFORNIA - April 25, 1965 Cat. I (25')
Four entrants, three qualifiers:

Clarence Mather	5:05	13:01	18:06
Art Gunnett	5:09	6:08	11:17
Bob Ferguson	5:27	5:05	10:32

LAKEHURST, NEW JERSEY - April 27, 1965 Cat. III (180')
Eight entries, six qualifiers, two flight totals:

Manny Radoff	53:14
Ernie Kopecky	52:14
John Triolo	49:55
Julius Rudy	43:09
Pete Andrews	42:01
C. V. Russo	38:20

UNION, NEW JERSEY - April 22, 1965
No results available (SEE PAGE 4)

CLEVELAND, OHIO - April 25, 1965
No results available (SEE PAGE 4)

WICHITA, KANSAS - April 28, 1965 Cat. I (24')
Four entrants, three qualifiers, partial results:

Stan Chilton	4:48	2:07	6:55

DETROIT, MICHIGAN - May 2, 1965 Cat. II (65')
Seven entrants, six qualifiers:

Dick Kowalski	22:42	26:59	49:01
Pat Green	21:28	20:40	42:08
Ed Stoll	20:34	21:04	41:38
Hardy Brodersen	17:33	19:32	37:05
Ralph Brehmel	12:10	12:00	24:10
Tim York	11:10	7:01	18:11

Quarter Final Trials

DALLAS, TEXAS - April 25, 1965 Cat. II (42')
Seven entrants, six qualifiers:

Bud Tenny	16:32	15:35	32:07
Jim Clem	12:08	14:36	26:44
Eric Vogel	11:50	11:35	23:25
Mike Ransom	11:37	11:39	23:16
Jess Shepperd	8:54	8:32	17:26
Bob Putnam	8:19	8:21	16:40

INDOOR RULES

Three proposals have been submitted formally to the FF Contest Board for consideration and study. Each one of the proposals have been aired here in previous issues as follows:

Indoor Record Trials Attendance Proposal - Jan. 1965
Hand-Launched Glider Proposal - March 1965
Proposal to Change Par. 4.7 - March 1965
Proposal Creating Easy B Event - April 1965

STATE OF THE ART

The model for this month won the Cabin event at the 1963 Nats, setting a new Cat. III record at the same time. The model itself follows the classic U. S. trend of design coupled with an extremely high degree of craftmanship in construction. Note particularly the wing spar dimensions - the spar tapers from a small dimension at the center to the maximum dimension at the dihedral rib and then to a small dimension at the tip in conventional manner. Frank uses this same spar construction on all his models, except that his FAI's have additional bracing to the first rib outboard of center and the tips are built with a small dihedral angle and then more dihedral is pulled in with bracing, giving a semi-stressed tip.

INDOOR ELSEWHERE

Czechoslovakia

Rudolf Cerny wrote a very nice letter to INAV giving quite a bit of info about Czech indoor flying which was revived in 1963. By now there are over 40 fliers active and the sport is still growing. They have suffered the usual pains of finding a good site, but recently were permitted to fly in a hall at the industrial fair which has a 40 meter ceiling (131') and floor area about 70 meters (240') in diameter. Their models are estimated to be capable of over 20 minutes, but their one contest in this site was held in temperatures below freezing and the rubber wouldn't put out very well. In spite of a poor source of materials, their best fliers are building FAI models to around .035 oz to .045 oz. Czech rules provide for a Junior class (paper covered and 35 cm. span) and two Open classes (35 cm. and FAI; both microfilm); they also have a class for helicopters.

The Czech fliers are very enthusiastic, but their normal problem of obtaining suitable materials is complicated by government restrictions on sending currency out of the country. It would seem to be a nice gesture if a group of U. S. fliers could sponsor a gift of good rubber to aid their cause - they might beat us with it if they can field an FAI team, but so what! If anyone is interested in such a project. drop me a line.

HINTS AND KINKS

Bracing Hint

Since many indoor sites are poorly lighted, Dave Linstrum suggests that a pen cell flashlight is handy to keep in the tool box for bracing repairs. Bracing wire shines clearly in the beam and is much easier to see. For dacron bracing, put the light behind the model - the dacron lights up and glows nicely.

Lube Storage

Jim Pulley suggests that rubber lube can be stored in a plastic box with a sponge inside. This is almost spill-proof and the motor can be lubed by dragging it through the box across the sponge.

JUNIOR HINTS

Junior Bracing

The American Thread Company makes a line of hot-stretched dacron sewing threads ranging down to .0035" in diameter which have a variety of uses around models. My sample is described as D-15 Left (Z) Twist, and is just right for beginners to learn bracing with. A very frantic search through chaotic files revealed no trace of my list of distributors for American Thread - but any modern library should be able to help you find the address if you wish to pursue the idea.

Mike Gliders

The much despised mike gliders really can serve a useful purpose - use them to familiarize youngsters with the problems of handling mike covered ships - and tow line launches make dandy fun if the models are built strongly enough.

INDOOR FLYING SCALE

Model Construction

Part I - Covering Material

by Fred Weitzel

Generally speaking, there are two covering materials used in Indoor Scale: jap tisue and condenser paper. The one that is chosen makes a big difference in the model that results.

The jap tissue is usually watershrunk and doped - which produces a smooth glossy surface that must be rated "tops" for appearance. However, this type of covering exerts a strong pressure, so the framework must be strong and therefore heavy. The added weight will necessarily make the flight fast and the duration less.

With condenser paper the surface tension is never as great, and a much lighter framework can be used. The lighter model resulting will fly slower and the duration will be higher. Also, a condenser paper covered model can look very good if carefully made - but due the fragility of condenser paper it may not stay that way for long. Rips and tears are easily acquired, and even neat patches and repairs hurt the appearance.

The jap tissue model is much more durable, so it is easier to handle and retains its initial "sharp" appearance permanently. These are strong arguments in favor of jap tissue - but when a light weight condenser paper model is flying properly it is indeed a joy to behold. It is a sight that makes the drawbacks of condenser paper well worth putting up with.

NEWS FROM AROUND THE WORLD

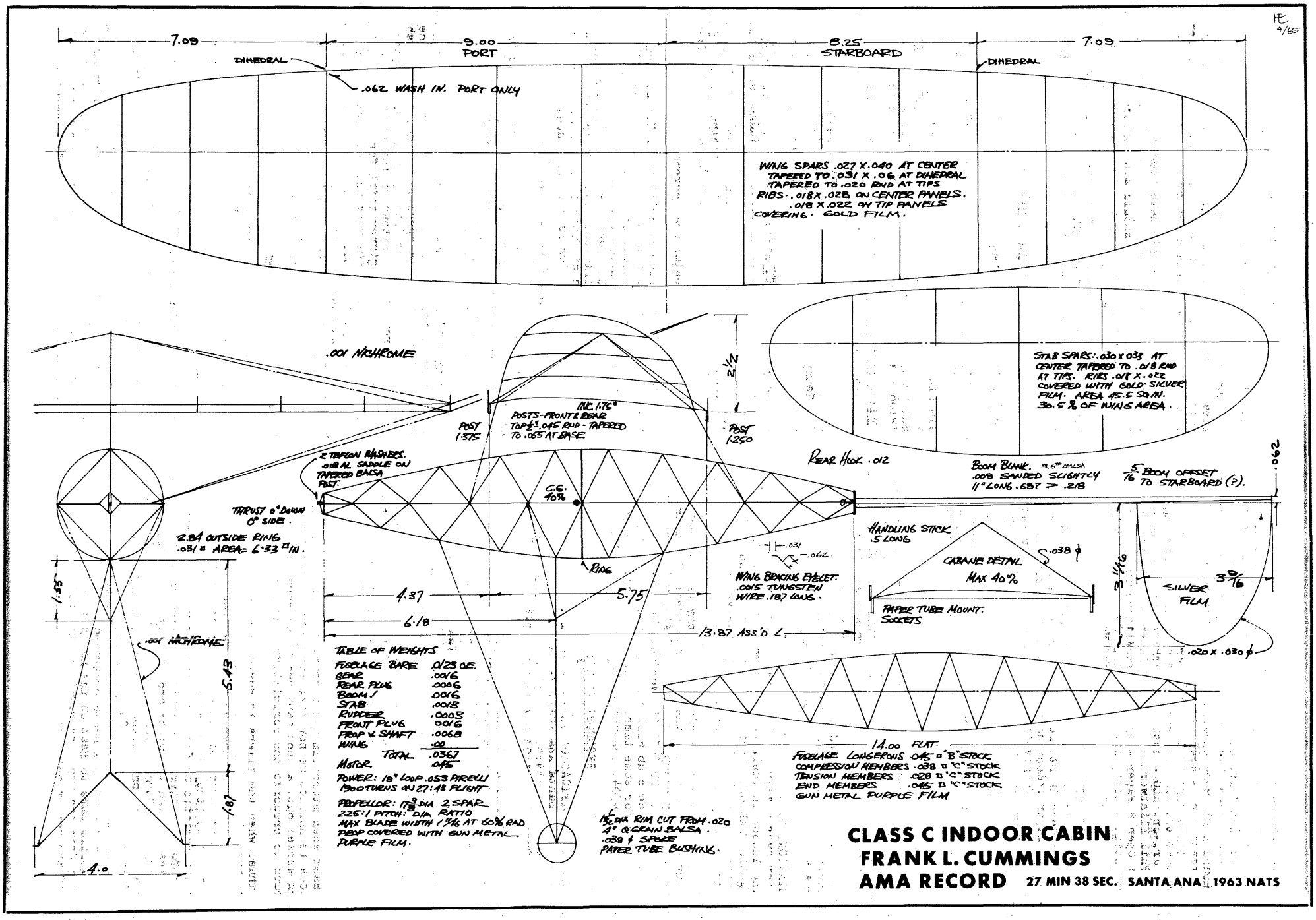
CALIFORNIA - SAN DIEGO

This year the San Diego Orbiteers have revived indoor in their area to the extent of having several indoor contests after club meetings, and then holding a local FAI trials to cap the season. Clarence Mather is one of the major sparkplugs of the movement - he seems to be good news for indoor wherever he goes! Their contests always have a good attendance and hot competition in HLG, Easy B and Scale is the expected thing.

ILLINOIS - CHICAGO

The fourth and last (for the season) contest of a series sponsored by the contestants and outside donors was held in the Madison Street Armory on May 1. A sign of the approaching outdoor season was the fact that there were only ten entries - but the competition was as fierce as any event all season. The winners: Jr. HLG - 1:45.4, Randy Richmond; Jr. Easy B - 9:26.5, Randy Richmond; Open HLG - 1:55.3, Tom Stone; Open B Paper - 19:03.5, Charlie Sotich; Open Indoor Stick - 26:46.6, Charlie Sotich.

These contests are a novel experiment - starting with a substantial balance from last year and aided by about 30 donations + entry fees for this season, very nice trophies were presented and a modest balance was left for the 1965-66 indoor season. Not bad for contests without any club sponsorship - but much credit is due Pete Sotich for managing the project so ably!



CLASS C INDOOR CABIN

FRANK L. CUMMINGS

AMA RECORD 27 MIN 38 SEC. SANTA ANA 1963 NATS

MICHIGAN - DETROIT

The Detroit Balsa Bugs held a Cat. I Paper Stick meet and the State Meet on successive weekends; high winds, turbulence and drift held times to a discouraging low for both meets. Then, Lady Luck smiled and the conditions for Round I FAI were excellent. The winners of the Paper Stick meet: Jr. - 4:45, Art Markiewicz; Open - 7:43, Pat Green. There were 12 Open and 4 Jr. entries. In the State Meet the winners (amid rain and tornado warnings) were: Jr.-Sr. HLG - 1:42, Art Markiewicz; Open HLG - 1:48, Phil Klintworth, Jr.-Sr. B Paper - 6:20, Art Markiewicz; Open B Paper - 13:01, Phil Klintworth; Jr.-Sr. Indoor Stick - 6:01, Art Markiewicz; Open Indoor Stick - 6:02, Pat Green; Open Scale - Bruno Markiewicz.

MISSOURI - ST. LOUIS

This spring the McDonnell Free Flight Club actively promoted indoor in St. Louis, finishing the season with the first major indoor competition in that city in more than 20 years. Twenty-five contestants from four states (seven juniors) fought turbulent conditions for beautiful trophies. Junior HLG - 0:59.0, D. Veselsky; Open HLG - 1:28.9, Bob Larsh; Jr. Easy B - 5:50.4, D. Wood; Open Easy B - 10:11.8, Charlie Sotich; Open Paper Stick - 10:22.8, Charlie Sotich; Open Indoor Stick - 10:09, Art Frost. More power to this club - they are doing a very good job!

NEW ZEALAND

Things are looking up for the Wellington club as they have been promised regular use of two sites - one Cat. I site with 21' ceiling and a Cat. II site with 38' ceiling. The New Zealand fliers have been aggressively active in spite of uncertainty in sites, and their times are at least on a par with good times here. With regular access to their sites they should be increasing the number of fliers and the level of their activity.

WASHINGTON, D. C.

For over a year the D. C. Maxecutors have been promoting indoor in their area in a most enthusiastic and energetic fashion. Their Cat. I meet turned up eighteen entrants in Easy B, sixteen in HLG, twelve in B Stick and six in Scale. The winners: HLG - 0:44.4, William Jewell; Easy B - 6:57, Reggie Batterson; B Stick - 7:28, Tom Vallee; Scale - Bill Saunders. A trophy was awarded to the Junior who placed highest in each event; Dan Champine won each trophy except the one for Scale, which was won by Curtiss Lee. No definite word has been received, but it is likely the club will continue to have monthly flying sessions for some time. Contact Tom Vallee, 9136 Edmonston Rd. #304. Greenbelt. Md. 20770 for info.

RECORDS? MAYBE!

FAI LOCAL QUALIFICATION TRIALS - April 11, 1965
Cat. III, Santa Ana MCAF, Santa Ana, Calif. 155'
Open FAI - 34:41 + 40:37 = 75:18, Joe Bilgri
Open HLG - 1:23.6 + 1:26.8 = 2:50.4, Curt Stevens

FAI LOCAL QUALIFICATION TRIALS - April 25, 1965
Cat. III, Moffett Hangar, 180' ceiling
Open C Stick - 39:48, Tom Finch

D. C. MAXECUTORS CAT. I CONTEST - April 11, 1965
Cat. I, Suitland Senior High, Suitland, Md.(20.5')
Junior D Stick - 3:58, Lynn Adams

FAI LOCAL QUALIFICATION TRIALS - May 2, 1965 65' ceiling
Cat. II, Michigan State Fair Coliseum, Detroit, Mich.
Open FAI - 22:42 + 26:59 = 49:01, Dick Kowalski

A LOOK AT YESTERYEAR

Back when microfilm was a brand new concept and the various techniques we now take for granted were just being worked out, a good many new ideas were jealously guarded to preserve the competitive edge that they gave.

Thus, when the fliers in Boston started using microfilm, those in New York pretty much had to scratch for information and then develop their own techniques. Frank and John Zaic worked out these techniques: retrieving with balloons (they made hydrogen from zinc floor stripping and muriatic acid); film trimming with a hot wire; saliva for adhesive and covering the wing on a table with a wet area around the wing; and finally they developed their own film formula and worked out the concept of putting a wire hoop on top the film and folding the edges of the film over the hoop. One early attempt at getting film up was to place a wooden hoop on the bottom of the bathtub; a row of nail heads protruded up from the hoop and the film came to rest on the nails as the water was drained from the tub. As might be expected, this wasn't one of the better methods!

QUESTIONS AND ANSWERS

32. What is a good formula for rubber lube?

Numerous formulas for rubber lube have been set up as ideal in years past; I have had good results with these two: 1. 2 parts glycerin & 1 part tincture of green soap. 2. 50% glycerin & 50% surgical jelly.

Lately, several people have been trying silicones of various types - both liquid and grease. These seem to work well as a lube, and should also protect the rubber from oxidation besides. Certain precautions should be kept in mind if you use silicones - care should be taken to keep the lube out of your eyes, and you should be careful not to touch wet glue joints with lube on your hands since the silicone will destroy the strength of the joint.

POSTAL CONTESTS!

Dallas Area vs. D. C. Maxecutors - Cat II FAI (42')

Jim Clem		Bob Randolph	
12:12 + 13:45	25:57	13:39 + 27:32	
Jim Clem		Bob Randolph	
12:12 + 13:45	25:57	13:39 + 13:53	27:32
Bud Tenny		Tom Vallee	
12:08 + 11:37	23:35	11:27 + 9:14	20:41

Dallas Area vs. D. C. Maxecutors - Cat. I HLG
(26' ceiling vs. 20.5' ceiling - fudge factor 1.27)

Larry Renger	William Jewell
0:54.5	0:44.4 (1.27) = 0:56.2
Bud Tenny	Dan Belieff
0:54.3	0:42.0 (1.27) = 0:53.3

Dallas Area vs. D. C. Maxecutors - Cat. I Indoor Stick
(26' ceiling vs. 20.5' ceiling - fudge factor 1.13)

Bud Tenny	11:59	Tom Vallee	7:28 (8:24.6)
Jim Clem	11:05	Bob Randolph	6:52 (7:52.2)
Eric Vogel	10:17	Bob Champine	6:50 (7:46.2)

Postal Challengers

The Wellington club in Wellington, New Zealand, will take on any U. S. club in Cat. I Easy B (Wilmington rules) and HLG; they will accept challenges from U. S. fliers in Indoor Stick (our B Stick vs. the N. Z. Under 18" class). Send challenges to Bud Tenny, Box 545, Richardson, Texas, for relay to the Wellington Club. Their Cat. I site is 21' high; no mention of fudge factor is made, but this will be checked into for future reference.

MORE "LIMITED" COMMENT

The March '65 INAV presented the story of the "limited" model as originated by the Tech Model Aircrafters of M. I. T., but the text contained one error. The correct size of wood for the fuselage stock is 1/4" x 1/4" x 12" rather than the 1/8" x 1/4" originally specified.

Now that I've seen one fly (and started building one), I'm amazed at the performance of these birds. If one were to make a kit for a specific design, and furnish the correct sizes of wood for fuselage and boom and (perhaps) a standard prop hangar instead of the tubing, this model would make an ideal beginner model for sub-teen juniors. If, in addition, the same wing and tail group design were used for a beginner IHLG, a significant standardization of parts would result - very important for the type of beginner program that would fit into a YMCA schedule.

LAST MINUTE BULLETIN

FAI Local Qual. Trial Results

UNION, NEW JERSEY - April 22, 1965 - CANCELLED
CLEVELAND, OHIO - APRIL 25, 1965 Cat. I (32')
Six entrants, five qualifiers, two flight totals:

Joe Hindes	16:52	Bill Hulbert	16:31
Ron Ganser	16:05	Lou Willis	10:45
Norman Bickar	8:51		

News From CIAM Meeting of April 23-24 in Frankfurt, Germany

Czechoslovakia has expressed an interest in organizing the 1966 World Championships for Indoor. This offer will be considered tentative until approved by the full CIAM Committee.

The officers of the CIAM plan to propose that any World Champs category which fails to hold two consecutive World Champs due to lack of an Organizer, or due to lack of sufficient entries, will be dropped from the World Champs schedule. FAI Indoor is presently the only category which is likely to be affected - two strikes and you're out!

PROP FORUM/LOW POWER

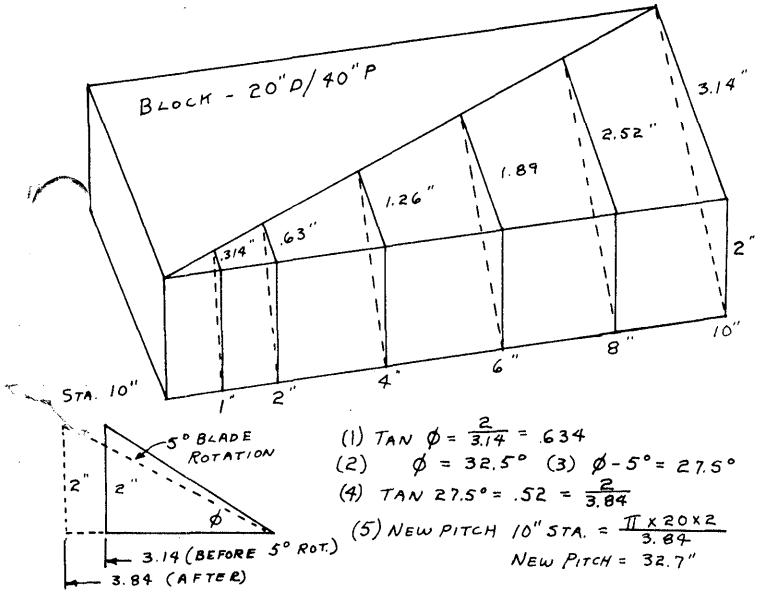
Part II - Pitch Distribution

It should be noted that at least three errors were found in Part I (after publication of course!). In order they are: Dimension "A" for Block II should be 3"; it should have been noted that the prop hook should be set perpendicular to the bottom of the modified type block, rather than parallel to the hub end of the block as is more normal practice; and the weights for the model and the rubber were transposed in the chart for Prop "C". This indicated a rubber weight 150% of airframe rather than the 68% it actually was.

Now, back to the business at hand. The sketch below illustrates the method of analysis for props modified in various ways discussed here. First, for a prop built on a standard block and converted to an adjustable pitch by plugging the spars into a tissue socket at the hub; the case illustrated is for a pitch setting of 5 degrees less than standard. The block is for a 20"D/40"P prop, and the end section (10" radius; 20" diameter) is figured; each station of interest is figured the same way. The basic definition for prop pitch is:

$$\text{PITCH} = \frac{\pi \times \text{DIAMETER} \times \text{BLOCK THICKNESS}}{\text{BLOCK WIDTH AT TIP}}$$

Note that the block width has been figured for each station on the sketch below; the order of procedure is as follows. Steps (1) & (2) - Figure the angle (ϕ) of the standard block. Step (3) - Subtract 5° from the pitch angle (since the new blade setting is 5° lower than standard). Step (4) - Compute a new block width which would give the new angle. Step (5) - Compute the actual pitch of the modified prop for that station. (The pitch for each station was 40" before the angle was changed.)



(1) TAN $\phi = \frac{2}{3.14} = .634$

(2) $\phi = 32.5°$ (3) $\phi - 5° = 27.5°$

(4) TAN 27.5° = .52 = $\frac{2}{3.84}$

(5) NEW PITCH 10" STA. = $\frac{\pi \times 20 \times 2}{3.84}$

NEW PITCH = 32.7"

After you compute the pitch distribution for a few blocks, the results may give you a shock - at least it startled me somewhat! The chart below gives pitch distribution for four props at radii of 1", 2", 4", 8" and 10". The conditions for each prop are:

Line (A) - 20"D/40"P prop set 5° lower in pitch.
Line (B) - Same prop with 1" cut out of center and re-assembled as 19" diameter prop with each blade element at the same angle as built - (20"D/40"P).
Line (C) - Prop built "stock" on 16"D/27"P and then set to 5° lower pitch.
Line (D) - Prop built on Block II from Part I.

	1" R	2" R	4" R	6" R	8" R	10" R
(A)	25.5"	30"	33"	33.7"	33.2"	32.7"
(B)*	20"	30"	35"	35.6"	37.4"	38"
(C)	12.7"	21.9"	22.6"	22.6"	21.6"	--
(D)**	17.3"	20"	23.2"	24.5"	25"	--

*The pitches listed here are for the sections which were at the radius shown; when the new prop is assembled each section will be at a radius 1/2" less than before.

**Props with this pitch distribution have worked the best of any investigated during this test program. Prop "C" outline (Part I) was used to win 5th at the '64 Nats, and a prop with outline "D" (below" was used to give the times listed below in a 42' site with lights to 28'. The first flight was on .033" pirelli, the next two on used .037 pirelli. Peak altitude for the first flight was 18', the second bumped the top (too long for comfort), and the third peaked at 31'.

TURNS IN	TURNS OUT	TIME	RPM	RUBBER WT.	MODEL WT.
1050	600	6:08	74	.016 oz.	.039 oz.
1500	360	16:32	69	.0195	.039
1740-180	465	15:35	72	.0195	.039

(180 turns backed off; max turns this motor about 1860)

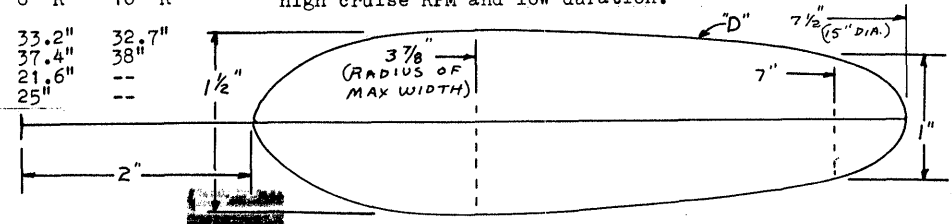
Since the application of the low power/modified prop has been strictly experimental and insufficient data has been collected to evaluate the potential, the following generalizations will serve as a guide:

1. Choose rubber weight to fit ceiling height; rubber weighing 50% of airframe wt. should match 65'. It should be noted that Cat. I rubber weights amount to power (and prop) similar to A ROG for Class C/FAI. This isn't as impossible as it sounds, but little testing in this region has been done.
2. The rubber loop should be 15% longer than fuselage.
3. Choose the prop diameter and blade area to match the rubber; the pitch should match the model's cruise speed. Experimental observation tends to show that for a given prop diameter and blade area, the same number of turns in the same motor will give the same peak altitude regardless of pitch. If the pitch is matched to cruise speed experimentally, with the model trimmed for slowest possible cruise, maximum duration will be obtained. That is, low pitch will use turns too fast and excessive pitch will require more torque than is available late in the cruise.

The theoretical advantages of this approach to low ceiling are: With lower rubber weight, the model wing loading is lower, resulting in lower cruise speed and lower RPM. The resulting long loop of low cross-section rubber has a flatter torque curve and the method tends to keep the model airborne on lower torque. The Hacklinger report contains a graph showing the effect of motor weight on flight duration (Figure 10) which shows that 50% rubber weight should give 30 minutes on a model which is capable of 42 minutes on 150% rubber. The report does not indicate if the graph is a plot of achieved performance or a theoretical analysis, but the graph clearly indicates a large gain in performance for those models which have the weight of the airframe varying as a function of the rubber weight - that is, a lighter model for low ceiling to match the lower rubber weight.

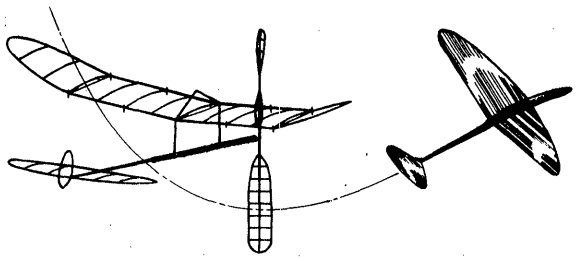
From a practical standpoint, the low power/modified prop approach gives less danger of hanging up on the first flights, especially if the rubber is closely matched to the ceiling height. Lower weight rubber permits lower structure weight and lower flying speed. The one component which may not be much lighter is the motor stick - experience indicates that it should be longer to keep the motor long without permitting much slack. The final advantage which may apply to the method is that such models may be less susceptible to drift. Hacklinger says "the effect of the propeller on stability is as though a surface of the same span and half the chord of the tailplane is placed at the position of the propeller." Thus, a smaller prop may well reduce the effect of drift, though this may be hard to prove.

If you should decide to try this approach, analyze some existing blocks and get the right "ballpark" with adjustable pitch props. A word of caution - only a few degrees less pitch goes a long way, so measure it very carefully - don't try to "eyeball" it! The penalty is a high cruise RPM and low duration.



The Voice of N.I.M.A.S. JUN·1965

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

BOB RANDOLPH, 8335 Boundbrook Lane, Alexandria, Va. 22309

Honorary Members

MANFRED KOLLER, Obertrum 258, Salzburg, Austria

NIMAS Awards

Cat. II Gold Rubber Award - 26:59, Dick Kowalski

NIMAS Aces

A growing number of NIMAS Award winners have expressed an intent to win (or try for) all three Awards in a given ceiling category. This gives rise to creation of the idea of NIMAS Aces - those who win all three Awards in a group, and Triple Aces - those who win all nine awards in either Rubber or HLG. The first NIMAS Ace is Bud Romak, who made the grade in two FAI elims. At the Santa Ana Local, he logged 31:37 and 35:30 to pick up the Silver and Gold; the Diamond Award came at the Moffett Quarter Final when he turned 37:26 and 42:01. This also gives Bud the FAI Cat. III record besides having the first "40" in Moffett and the first official "40" at any U. S. hangar besides Santa Ana.

Spread The Word!

Last winter Neil Shipley was featured in a newspaper article in his hometown newspaper. In the busy aftermath of the article, he was interviewed on the local radio station for half an hour and was invited to give a demonstration at the Norwalk Junior High School. The show was scheduled to last 45 minutes, but he was "held over" an additional 45 minutes! Two months later he was asked to repeat the demonstration, and now quite a few of the students are building indoor models under Neil's guidance (in his spare? time). Neil has this to say about indoor and his success at spreading the word, "I think indoor modeling would be a much more popular hobby if more people knew about it. The public is very interested in this type of hobby. It just takes a couple of minutes for a modeler to go around and let the public know what they are missing. A little effort can bring big results. Since I have gotten indoor modeling to be known as an interesting hobby, I am now allowed to fly in the Norwalk Armory, the High School gym, and the Junior High School gym."

Recent Publications

The July '65 M. A. N. has a very interesting bit entitled "Sweepette" - by Lee Hines. That's right, the "old master" himself tells the story of the most consistent glider design of our time, complete with plans of his Sweepette 18 Mk.13 - the first HLG to top 1:20. OK, you HLG men! M. A. N. has done you a real service to bring you this information and you should drop them a note to thank them.

FAI INDOOR REPORT

Team Selection Trials Schedule

Semi Finals

WEST COAST - June 13, 1965
Bruce Paton, 1010 N. Mirasol St., Santa Ana, Calif.
NORTH CENTRAL ZONE - June 6, 1965
Paul Crowley, 32604 Tecla Dr., Warren, Michigan
SOUTH CENTRAL ZONE - June 19, 1965
Bob Wilder, 2010 Boston, Irving, Texas
EAST COAST - June 22, 1965
C. V. Russo, 143 Willow Way, Clark, New Jersey

Qualification Trial Results

DENVER, COLORADO - May 9, 1965 Cat. I (34')
Four entrants, three qualifiers:

Stan Chilton		22:19
Robert Greider, Sr.		14:27
Hal Blubaugh		14:11

SANTA ANA, CALIFORNIA - May 9, 1965 Cat. III (155')
Five entrants, four qualifiers:

Clarence Mather	26:03	28:26	54:29
Art Gunnett	29:55	24:20	54:15
Warren Williams	24:47	27:39	52:25
Bruce Paton	21:27	14:40	36:07

MOFFETT FIELD, CALIFORNIA - May 16, 1965 Cat. III (180')
Five entrants, four qualifiers:

Bud Romak	37:26	42:01	79:27
Joe Bilgri	36:44	39:56	76:40
Carl Rambo	30:58	35:12	66:10
Manny Andrade	28:54	29:35	58:29

WASHINGTON, D. C. - May 16, 1965 Cat. II (45')
Nine entrants, seven qualifiers:

Hewitt Phillips	17:22	18:50	36:12
Bob Champine	16:04	17:54	33:58
Bob Randolph	15:40	16:31	32:11
Reggie Batterson	14:23	14:21	28:44
Tom Vallee	12:52	12:49	25:41
Claude Tilley	8:57	10:39	19:36
Dan Champine	8:35	8:18	16:53

CHICAGO, ILLINOIS - May 22, 1965 Cat. II (75')
Five entrants, four qualifiers:

Charlie Sotich	27:12	26:30	53:42
Curtis Janke	22:59	25:02	48:01
Tom Stone	18:13	21:01	39:14
Clarence Mills	18:34	17:36	36:10

LAKEHURST, NEW JERSEY - May 25, 1965 Cat. III (180')
Six entrants, five qualifiers:

Ernie Kopecky	33:04	34:10	67:14
John Triolo	29:09	33:35	62:44
Julius Rudy	27:36	30:10	57:46
C. V. Russo	25:52	29:24	55:16
Pete Andrews	25:47	27:06	52:53

DETROIT, MICHIGAN - May 23, 1965 Cat. II (65')
Ten entrants, eight qualifiers:

Dick Kowalski	24:27	26:49	51:16
Bill Hulbert	22:39	24:48	47:27
Pat Green	21:40	20:56	42:36
Joe Hindes	22:14	20:56	42:36
Ron Ganser	19:14	10:43	40:24
Norm Bickar	15:25	11:06	26:31
Lou Willis	11:51	10:51	22:42
Tim York	13:51	8:22	22:13

FAI Finals Set

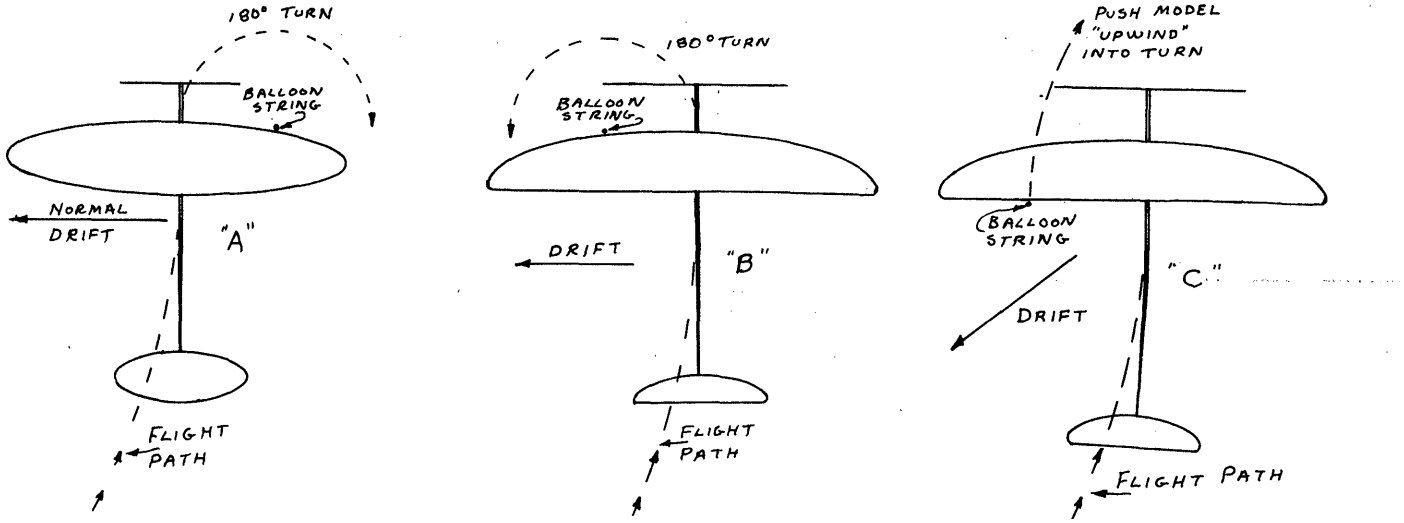
The FAI Indoor Finals have been scheduled for one day only, Tuesday, July 27 at Lakehurst #6. Details for the rounds schedule will be made available to the qualifiers as soon as they are decided. It is anticipated that this Finals will have the largest entry ever - each Zone Semi Final has enough qualifiers to qualify a full three man team, and the 1964 Team members are permitted to enter without having had to "run the gauntlet" of the qualification trials. Truly, this should be the indoor contest of the ages!

BALLOON STEERING - A SECOND LOOK

Two years ago (May '63) INAV ran the only article I have ever seen on the important business of steering FAI models via balloons. In essence, the method was to intercept the model "upwind" of the anticipated collision or hangup (see "A" below) by letting the outboard wing contact the balloon so the model would pivot 180° around the string, thus re-locating the model's orbit "upwind" by approximately the diameter of the flight circle.

This method is easily learned and very efficient - until you try to steer models with extreme wing offset such as Charlie Sotich's "Dram Dip" FAI. If you catch this type model at the outboard dihedral break or closer to the fuselage, there is insufficient leverage to force the model into a turn against the flight path, and the model just hovers or slides down the string. An alternative method (see "B" below) is to catch the model on the leading edge of the inboard wing and let it turn with the flight turn for 180°. This method (provided the model doesn't spin off the string) puts you "upwind" by about one wingspan less than method "A" and is just as easy to do.

A third method (which has not been tried in Cat. III sites) is to approach the model behind the inboard wing (see "C" below) and (1) walk the model around in a circle similar to "B", or, (2) walk the model "upwind" for about eight seconds and release it. Eight seconds sounds like a short time, but this is enough to walk a model half-way across the average Cat I site and you can certainly gain as much ground as in "A" or "B". In addition, the model will fly away from the string with less danger than the other methods - just don't catch the stab!



HINTS AND KINKS

Microfilm Patching

The method most commonly used for film patching is to wet the edges of newspaper or similar coarse grained paper, stick it to the film, trim the wet edges of the paper, and lay the patch over the hole. For dry film which won't stick to itself, the usual procedure is to wet the edges of the hole before applying the patch.

Curtis Janke and other Chicago fliers do it this way: Stick the film to fairly rough mimeograph paper which has been further roughened with sandpaper. Stick the paper to a piece of balsa which will serve as a handle, thus making it easy to place the patch over the hole. Set the patch in place and wet around the patch generously, and lift the paper by peeling one edge loose first. This method prevents the hole from getting bigger as it quite often does when you wet the hole first. Of course, if you are patching with film that is not completely "dry" the patch will stick without wetting.

Glider Marking

Tom Vallee uses his return address stamp to mark his gliders with negligible weight addition.

Glider Nose Weight

Small gage solder makes excellent nose weight for indoor and outdoor gliders - it can be wrapped closely around the nose and glued in place. Fingernail clippers can be used to remove small amounts, and modelling clay can be used for final trim. A coarse sanding block can be used to streamline the lead for lower drag, or the solder can be run through a wire mill to flatten it so it will make a thin smooth wrap without sanding.

Glider Warps

Nickey Jones suggests that the ultra-thin tail surfaces on low ceiling gliders can be straightened out when they warp by using an iron (you know - like they iron your shirts with) to press them flat again. It only has to be warm - if it is too hot you could scorch the wood or ignite any filler that might be on it.

A LOOK AT YESTERYEAR

1939 Indoor Nats Results

Jr.-Sr. Indoor Stick			Open Indoor Stick		
1.	Ed. Naudzius	17:51.6	1.	Ed Fulmer	14:34.6
2.	Alvie Dague	17:29.3	2.	Pete Andrews	14:32.5
3.	John Stokes	17:07.3	3.	Andrew Peterson	13:31.5
4.	Milt Huguelet	16:+	4.	James Cahill	13:31.5
5.	Robert Jacobsen	15:+	5.	Joseph Matulis	12:52.5
6.	Ted Just	15:04.3	6.	George Bailey	10:59.5
7.	Gilbert Shurman	14:35.5	7.	Ed Levy	10:54.5
8.	Charles Belsky	14:33.2	8.	Roger Hammer	10:47.5
9.	Alfred Bobier	14:10.0	9.	Jesse Bieberman	10:38.5
10.	Matthew Smith	14:00.5	10.	John Zaic	10:34.5

Note that the younger fellows were outflying the Open contestants in those days, and that their times in the Grosse Ille hangar are about equal to the times the same age groups are turning in similar ceilings today. We may have made great strides today, 32 years after microfilm was introduced at the Nats, but these young fellows were building with techniques that were just 7 years old!

POSTAL CONTESTS!

Washington, D. C. Quarter Final vs. Dallas Quarter Final

Hewitt Phillips	36:12	Bud Tenny	32:07
Bob Champine	33:58	Jim Clem	26:44
Bob Randolph	32:11	Eric Vogel	23:25

D. C. Maxecutors vs. Dallas area team - FAI Indoor Cat.II

Bob Randolph	28:13	Bud Tenny	32:07
Tom Vallee	26:47	Jim Clem	26:44

Postal Challengers

The D. C. Maxecutors have accepted the Dallas area challenge to fly their times at the Lakehurst Semi Final against the times of the Dallas Semi Final with a fudge factor to allow for the different ceiling heights; the Maxecutors have also accepted the Cat. II challenge sent out by the Wellington club in New Zealand.

STATE OF THE ART

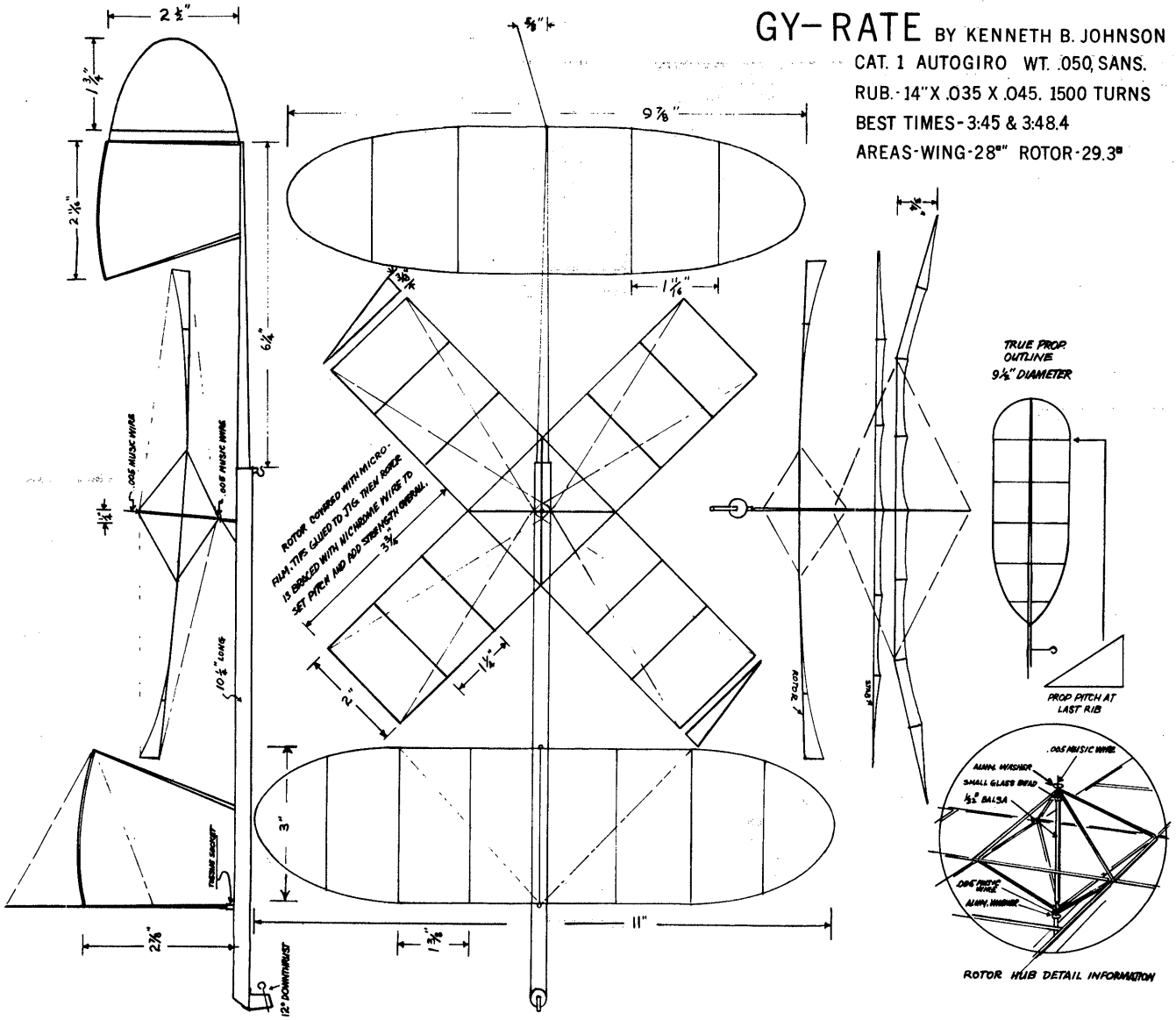
The "GY-RATE" Autogyro

by Ken Johnson

To date I've built about ten autogyros, and this one I consider to be the best. It was flown at the Cat. I Record Trials at Cleveland on April 11, 1965, setting a new record of 3:48.4.

The model was conceived because I felt that building a conventional rotor was difficult and the finished product was too heavy. This rotor can be built flat on the board complete as a unit, then the pyramids are built on the top and bottom of the hub. It is covered with three sided mike frame and then spot-glued on a jig which sets the negative incidence for the tips and holds it while the tips are braced to the top and bottom of the pyramids as sketched on the plans.

The pin through the hub should be installed before covering; I found that the .005" dia. center wire from a U-Control lead-in cable was both very light and gave the flexibility I wanted to throw the rotor back when the model is near a stall. This results in more rotor spin and more lift, while helping to keep the model out of a complete stall. I also felt it was desirable to lower the C.G. of the model by raising the wing and stab and lowering the rotor post - which also protects the rotor from damage.



SPECIAL NOTICE

* * * * * * * * *

EASTERN INDOOR FLIERS!

C. V. Russo hopes to schedule a weekend flying session over the July 4th weekend, provided enough people are interested in attending. If you are interested, he must know on or before June 15, 1965 so the necessary arrangements can be made. Contact him at 143 Willow Way, Clark, New Jersey.

RECORDS? MAYBE!

FAI QUARTER FINALS - May 16, 1965
Cat. III, Moffett Hangar, 180' ceiling
Open FAI - 37:26 + 42:01 = 79:27, Bud Romak

FAI QUARTER FINALS - May 22, 1965
Cat. II, Madison Street Armory, Chicago, Ill. 75'
Open FAI - 27:12 + 26:30 = 53:42, Charlie Sotich

FAI QUARTER FINALS - May 23, 1965
Cat. II, State Fair Coliseum, Detroit, Mich. 65'
Junior C Stick - 19:46, Tim York

FAI QUARTER FINALS - May 9, 1965
Cat. I, Aurora, Colorado HS Gym, 34' ceiling
Open FAI - 22:19, Stan Chilton

INDOOR ELSEWHERE

Austria

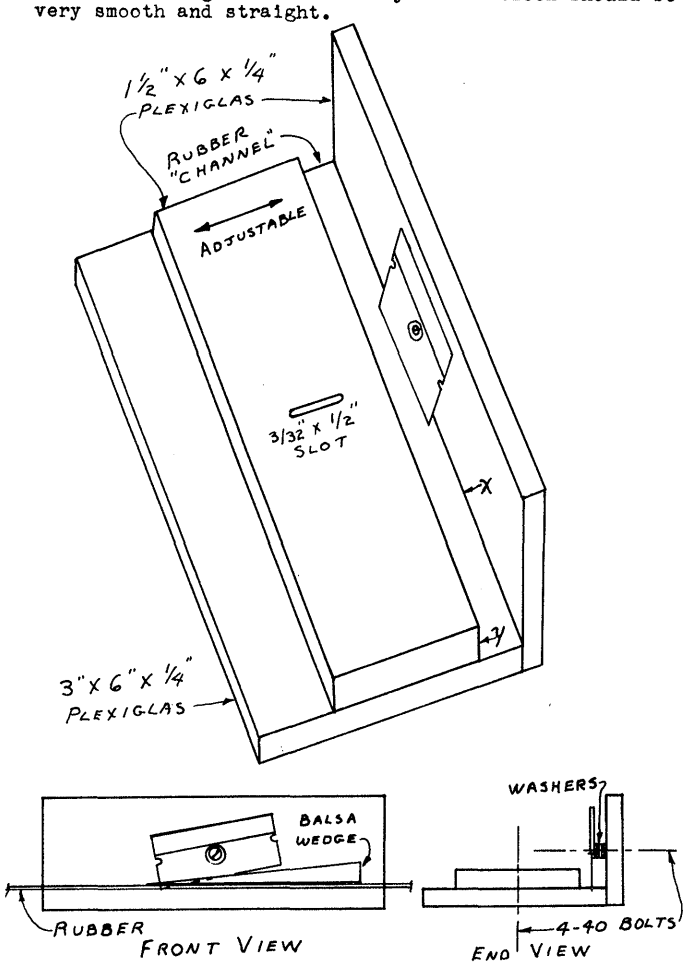
Manfred Koller reported on the activity in Salzburg, saying that their main flying site is the railway station which they must use after midnight. The flying session which produced their records (6:12 in mike and over four minutes in paper stick) was drafty, and two very large chandeliers caused several models to hang up. Recently, the building was renovated and the chandeliers were taken down - Manfred and his friends didn't protest a bit!

QUESTIONS AND ANSWERS

33. Have you any plans for a rubber stripper?

The following information came from Joe Bilgri's article "Strip Your Own Rubber" in the June 1956 M.A.N.; it is the only workable stripper I have seen. If anyone else has a better one, let's see it.

All the parts of the stripper are cut from Plexiglas; joint "X" is glued and care should be taken to prevent glue from building up in the inside corner in the rubber "channel." Edge "Y" of the adjustable block should be very smooth and straight.



The chief factors which make this stripper work are the smooth Plexiglas surfaces which minimize friction on the rubber, and the balsa wedge (front view) which holds the rubber flat in the "channel." The balsa wedge must be almost exactly as wide as the rubber strip before it is cut. The adjustable block should fit right against the rubber (with the wedge on top); it should then be locked down with the locking bolt.

Use a new and sharp blade for each new cut; choose a number of washers which will locate the blade about in the middle of the strip to be cut. Once the cut starts, move out about 6' from the stripper to let tension in the two cut strips equalize. Plan to make each cut as long as possible unless it "runs out" to the side, and try to set up each cut so the basic strip is cut in half. So far, I have been unable to strip pieces narrower than .030" with any consistency; my "low power" approach led me eventually to search out rubber strip thinner than the .043" thickness of pirelli. In this way, I was able to get longer loops of very small cross-section that I could not cut from pirelli.

My impression of rubber stripping is that it is an art like pouring microfilm; anytime you get a good start, keep on stripping. Conversely, if you are having trouble, start over some other night! Bilgri suggested that the rubber friction could be lowered with talcum powder, and Jim Kagawa suggested that wetting the rubber just before cutting helped get consistent cuts. Good luck!

INDOOR FLYING SCALE

Model Construction

Part II - Wing Construction

by Fred Weitzel

When Jap tissue is used for covering, "solid" ribs are generally necessary, and construction follows "outdoor" lines.

For light weight condenser paper covered wings, the "split rib" type shown is adequate, and is a logical method to use because of the obvious weight saved. The upper ribs are cut just like indoor ribs. They should be cut from thin stock, but dimension "x" must be wide enough for good compression strength. The spar does not have to be notched at the rib stations, and for small models the leading edge and trailing edge don't have to be shaped to match the airfoil.

This structure builds "quick and easy" and is suitable for most uses. Its one drawback is that wings built in this way often lack strength in resistance to up-bend. This is not crucial if there are struts or rigging available to provide the necessary hold-down force. Otherwise more structural rigidity is needed, and a capstrip added to the top of the spar as in "B" is a good answer. In fact, it works so well that a thinner spar can then be used, with weight saved and adequate strength remaining. The capstrip extends full span, but it is cut into sections that fit between the ribs.

"SPLIT-RIB" TYPE

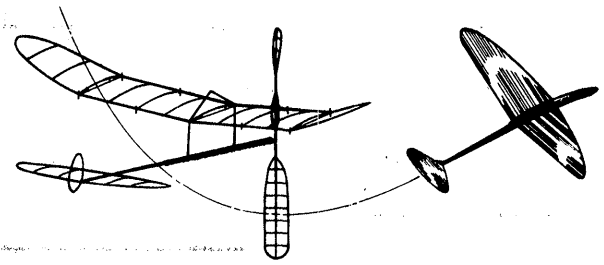
ELECTRONIC ELLIPSES!

During the course of my work last week, I was checking an X-Y Recorder I had repaired. For a signal source I used a Hewlett-Packard Model 203A Variable Phase Function Generator - with proper setting of the controls it produced very nice ellipses. After plotting out a couple of stab outlines, I set the recorder so about half the pattern was off-scale. This produced ellipses big enough for a "B" wing - rather, half an ellipse with the rest jammed against the edge of the paper.

Of course, if you want to get really fancy, program your IBM computer for a family of ellipses and run them off on a tape plotter! So far, I can't really justify the cost of about $50 per hour on the computer and the plotter - to say nothing of programming costs!

The Voice of N.I.M.A.S. JUL·1965

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

BILLY B. DUNLOP, Box 7471, Dallas 9, Texas
HEWITT PHILLIPS, 310 Manteo Ave., Hampton, Va.

NIMAS Awards

Silver Cat. I Rubber Award - 11:49, Stan Chilton

Silver Cat. II Rubber Award - 22:03, Stan Chilton

Gold Cat. II Rubber Award - 25:33, Curtis Janke

Silver Cat. III Rubber Award - 29:24, C. V. Russo
- 32:42, Tom Vallee
- 33:35, John Triolo

Spread The Word!

After making so much noise about publicity for Indoor flying, I could hardly let the South Central FAI Semi Final pass without an attempt at getting some local news coverage. I wrote two press releases (on NIMAS letterhead, of course!) and sent them to the two Dallas papers. One paper printed a very short announcement of the event, and I figured that was that. However, just before Round I, a reporter from WBAP-TV showed up, camera in hand. Since the lighting was poor, I felt this was a futile ttempt, until we hit upon using the well-lit lobby as a emonstration area. All the contestants moved models and oxes to the lobby, where a very expertly handled film strip was made. The resulting 5 minute coverage was seen on "Texas News" at 10 PM, and got us many interested comments and possibly one new indoor flier.

The "icing on the cake" came when the second newspaper sent a reporter around to gather info for a feature article in the Sunday edition. We got a cleverly written article which was factual and interesting, including a picture and results of the meet. Although I started with a pessimistic outlook, the publicity we got was worth the trouble. It doesn't hurt to try!

Zaic Year Book

Early this year, Frank Zaic's doctor told him to sit around for about eight weeks - so he started on the 1964/65 Year Book. This one covers the field pretty well as we have come to expect, but the section on Indoor is larger than usual and contains some priceless bits of indoor history, besides summarizing our tremendous progress in the few years since the last Year Book. The price is up to $5, but I doubt that anyone having copies of earlier Year Books would sell them for that! Order yours now - send a check to Frank Zaic, Box 135, Northridge, California.

That VORTEX FOCUS Bit!

New York
May 27, 1965

Dear Bud,

Referring to Loof Lirpa's suggestion in the April Issue of INAV to use a glider's wingtip vortices to recenter the fin, I want to tell you of my attempts to use the system. Most important is my final conclusion with r. Lirpa that it does work.

I built six gliders; more and more finding that for best results it was necessary to shorten the wingspan and increase the chord to a very low aspect ratio, at the same time extending the fuselage further and further out behind the stabilizer to mount the fin at the convergence of the two vortices.

The resulting stability is truly exceptional, but the sacrifice in wing efficiency plus increased fuselage weight and clay balance resulted in somewhat lower durations than the design from which the experimentations developed. Further experimentation may overcome this.

I hope you will publish this in order to encourage others to be guided by your technical articles.

Sincerely yours,

Yam Nevesytnewt

Back Issues?

The NIMAS files contain several each of seven issues from 1963, and complete coverage beginning with January 1964. NIMAS members may obtain a set for the cost of postage (40¢) and subscribers may get back issues for 10¢ per copy.

The August Issue

Since the entire INAV staff will be on a camping and sightseeing tour (which just happens to include the Nats and the FAI Finals), and will not return home until about August 8, the August issue will be a bit late. If plans for the issue work out, it will contain complete results from the Indoor Nats and the Finals, plus good picture coverage of this activity.

FAI INDOOR REPORT

Semi Final Results

In spite of the diversity in locations and sites, the four U. S. FAI Indoor Semi Finals had the common denominator of less than optimum conditions. This led to a personal disappointment in that I had hoped that the magic "45" would turn up in one of the hangars, and that the Cat. II "30" would be an officially recorded reality. In spite of the conditions, the program has been a hard-fought battle which saw new FAI records set and broken, with a few other records set on the side.

NORTH CENTRAL ZONE - Detroit, Michigan, June 6, 1965
Michigan State Fair Coliseum - 65' ceiling.

Charlie Sotich	24:11	24:40	48:51
Dick Kowalski	23:59	24:22	48:21
Tom Stone	23:41	22:54	46:35
Bill Hulbert	22:35	23:34	46:09
Lou Willis	23:44	21:44	45:28
Curtis Janke	18:01	25:33	43:34
Pat Green	20:08	22:20	42:28
Joe Hindes	19:07	17:05	36:12
Tim York	9:29	8:15	17:44

Conditions early were high humidity and 85° temperature with deceptive and unpredictable air. During the 5th round a thunderstorm came up, and models were packed by flashlight and by guess at the end of the flying. The rest of the day there was a temperature inversion, which added to the difficulty of finding the right power combo.

WESTERN ZONE - Santa Ana, California, June 13, 1965
Santa Ana MCAF - 180' ceiling.

Joe Bilgri	33:55	30:03	63:58
Carl Rambo	26:54	35:07	62:01
Clarence Mather	29:07	28:41	57:48
Art Gunnett	26:29	26:54	53:23
Bud Romak	21:27	11:46	33:13
Warren Williams	13:14	12:02	25:16

Bruce Paton	14:09	9:00	23:09
Manny Andrade	11:02	10:46	21:48

All day long the conditions were drafty and turbulent - so bad that no one opened their boxes if they didn't have to! If a model managed to blast through the inversion layer it usually hung, otherwise the turbulence ruined the last 50' of cruise.

SOUTH CENTRAL ZONE - Dallas, Texas, June 19, 1965
State Fair Coliseum - 68' ceiling.

Stan Chilton	20:00	22:03	42:03
Jim Clem	18:32	18:04	36:36
Bud Tenny	17:33	17:31	35:04
Eric Vogel	15:07	16:13	31:20
Mike Ransom	11:41	10:54	22:35
Bob Putnam	9:11	8:27	17:38

Very high humidity hampered efforts all day long; the air was otherwise exceptionally stable until late in the 5th round. The drift buildup spoiled at least five flights, three of which would have been over 20 minutes. A classic disappointment occurred on one flight which hung for 12 seconds, lost its turn as it fell free, and landed 25' up in the bleachers with a total of 15:01. The highlight of this meet was the donation of $100 for site rent; without this generous gift the Semi would have been very expensive or limited to a poor site. We owe Bob Wilder a vote of thanks for a good job of CD'ing the meet - he filled in at the last minute, including getting his CD license!

EASTERN ZONE - Lakehurst, New Jersey, June 22, 1965
Lakehurst #6 Hangar - 180' ceiling.

Pete Andrews	36:36	32:30	69:06
Ernie Kopecky	32:50	33:13	66:03
Tom Vallee	32:14	32:42	64:56
Bob Champine	29:55	30:35	60:30
Julius Rudy	28:55	29:22	58:07
John Triolo	23:06	32:46	55:52
Bob Randolph	28:14	23:08	51:22
C. V. Russo	23:54	21:32	45:26
Hewitt Phillips	30:36	10:09	40:45
Dan Champine	25:45	9:44	35:29

High humidity made it hard to get altitude; low side drift favored those who did make it above the catwalks. As usual, it was necessary to get above the catwalks, no matter what the risk. One highlight of the meet was Dan Champine's long flight; his next flight hung and wrecked the model and the 9:44 was made with a B stick.

The FAI Finals

As of July 7, the final arrangements for the FAI Finals, scheduled for July 27 at Lakehurst #6, have not been announced. In a letter dated July 5, Tom Finch said that six of the twelve qualifiers had not confirmed their intent to compete and that the 1964 Team members were not obligated to confirm. Therefore, it can be assumed that each area will be represented by the top three winners at the Semi, except that Clarence Mather has resigned his place on the West Coast team because he resumed studies at Purdue University. Unofficially, Art Gunnett has also waived the honor, which makes it likely that Bud Romak will make the trip. Final arrangements will be announced to the qualifiers as soon as possible.

INDOOR RULES

After long and serious study of comments by indoor fliers, results of the Rules questionaire and study of Indoor as it exists and is flown today, the following proposal has been developed. The Indoor Rules Committee is studying the proposal now, but we would appreciate all comments you might care to make before it is submitted to the FF Contest Board for formal consideration.

Change Section 8 to read:

8.1 GENERAL. A powered model of the indoor type shall be so designed that it can only be properly flown indoors. No restrictions shall be placed on these models except that they shall meet the specifications in this section. Indoor model classes which shall be recognized for National Records are defined as follows:

Rise Off Ground Stick Model - the projected area of the supporting surface (s) shall not exceed thirty square inches.

Paper Covered Hand Launched Stick Model - The projected area of the supporting surface (s) shall not exceed one hundred square inches.

Hand Launched Stick Model - The projected area of the supporting surface (s) shall not exceed three hundred square inches.

Rise Off Ground Cabin Model - The projected area of the supporting surface (s) shall not exceed one hundred fifty square inches.

FAI Indoor Model - Specifications are the same as for world championship FAI Indoor Models elsewhere in the Rule Book.

Autogyro - No restrictions on model size or method of launch.

Ornithopter - No restrictions on model size or method of launch.

Helicopter - No restrictions on model size or method of launch.

8.2 CLASSIFICATION. Delete this paragraph.

8.3 through 8.6 - No change in content; re-number in consecutive order.

8.7 FLYING-WING MODEL. Delete this paragraph.

8.8 and 8.9 - No change in content, re-number 8.6 & 8.7.

8.10 WHEEL SIZES. Change to 8.8; change to read:

8.8 WHEEL SIZES. Rise Off Ground models shall have free rolling wheels no smaller than the following: Stick Model - 1/2" diameter, Cabin Model - 3/4" diameter.

8.11 Delete this paragraph.

8.12 through 8.21 No change in content; re-number in consecutive order beginning with 8.9.

To summarize the changes made by this proposal, the only models which are made obsolete are ROW Cabin models. B and C Cabin is combined, and all classes of Indoor Stick except FAI are combined. This brings the model classes into line with the way the events are flown - no contests with separate classes for different sizes of Stick or Cabin models have been flown for years. With no limitation in Indoor Stick wing area except for the upper limit of 300 sq. in., the fliers are free to choose the model size to fit the site and conditions. For example, at the State Meet in Detroit this year Paper Stick far outstripped Indoor Stick, and at the St. Louis meet top time was with a paper covered Easy B. Even in ideal conditions most Cat. I sites are better tackled with models of 100-130 sq. in., because of circle size limits.

STATE OF THE ART

Believe it or not, there have been several requests for plans of my models - now that I finally managed to set a record, I decided the time was ripe. The record was short-lived, since Stan Chilton beat it before I got the record certificate back from HQ! The two flights which totalled 21:28 (Cat. I FAI record) were official flights in an AMA contest (no steering). I made an FAI record attempt after my last AMA official, but it ran into drift and I couldn't balloon it without ruining an AMA flight cruising just below my model.

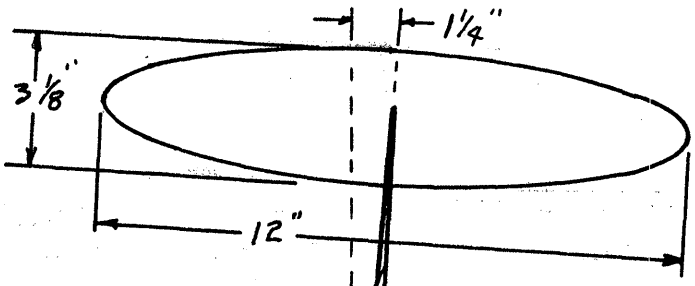
The flight was made with a 14 x 26 prop (outline on the plans) and rubber weighing 70% of the airframe. It was my intention to use less rubber, since the model easily outclimbed the ceiling, but there wasn't time to work up a smaller loop. The model started the evening with a 120 sq. in. wing which was smashed in a hangup, and the 143 sq. in. wing shown was substituted. This left a short-coupled model with 68% CG and only 22% stab, but no stability problems arose. Some idea of the model's potential is indicated by the fact that it hit the wall 20' up at about 8 minutes on the record attempt; on the basis of past performance and turns left it should have done over 13 minutes.

RECORDS? MAYBE!

FAI SEMI FINAL - June 22, 1965
Cat. III, Lakehurst #6, 180' ceiling
Junior D Stick - 25:45.4, Dan Champine

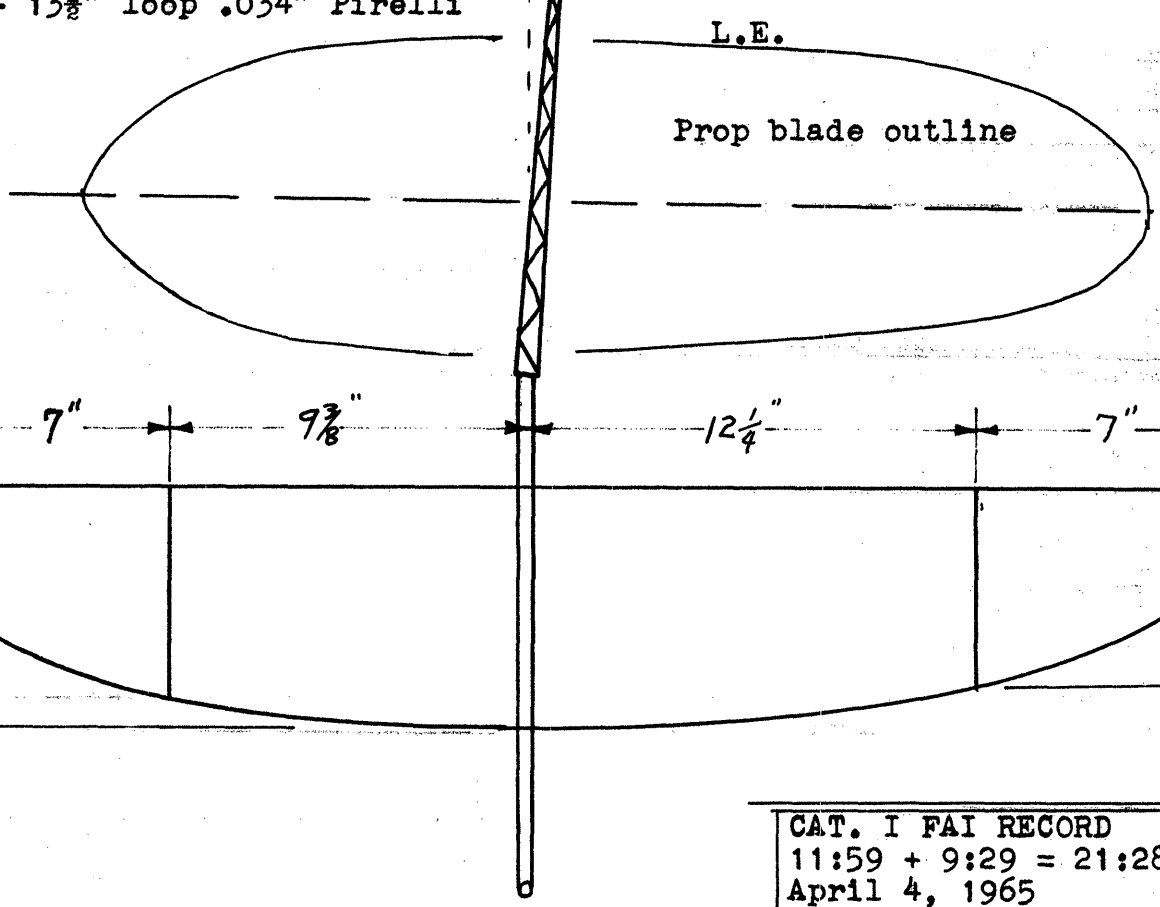
FAI SEMI FINAL - June 19, 1965 (68' ceiling)
Cat. II, State Fair Coliseum, Dallas, Texas
Junior FAI - 31:20, Eric Vogel

MOFFETT RECORD TRIALS - July 4, 1965
Cat. III, Moffett Hangar, 180' ceiling
Open C Stick - 39:55, Tom Finch
Open FAI - 79:53, Carl Rambo

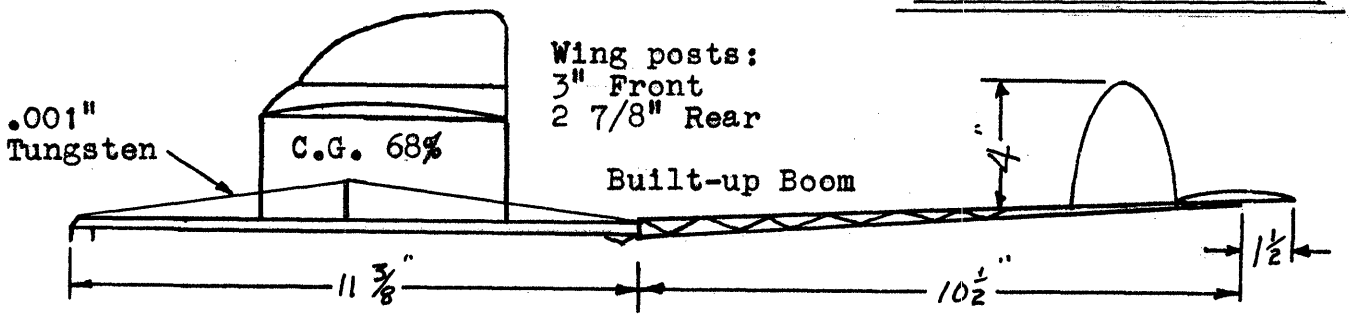


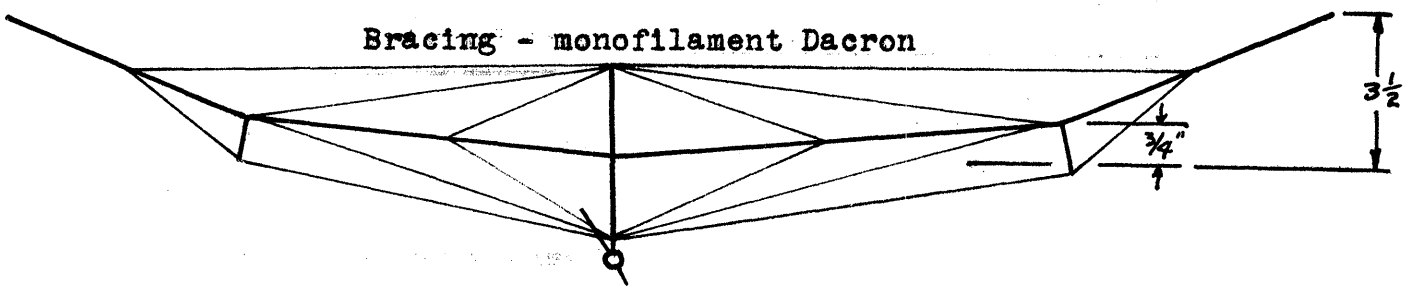
Wing	.0137 oz.
Stab	.0016
Fin	.0004
Stick	.0075
Boom	.002
Prop	.0045
	.0297 oz.

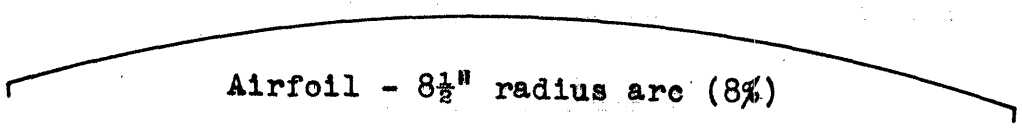
Prop - 14"d. x 26" p.
Rubber - 13½" loop .034" Pirelli



CAT. I FAI RECORD
11:59 + 9:29 = 21:28
April 4, 1965







POSTAL CONTESTS

Bud Tenny vs. Charlie Sotich, FAI Semi Final times

Bud Tenny	35:04	Charlie Sotich	48:51

D. C. Maxecutors vs. Dallas area fliers - Semi Final

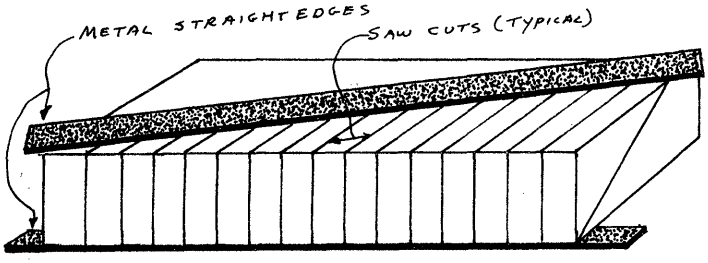
Cat. III (180') vs. Cat. II (68') Fudge factor 1.63

Jim Clem	36:36(1.63) = 59:16	Tom Vallee	64:56
Bud Tenny	35:04(1.63) = 57:15	Bob Randolph	51:22

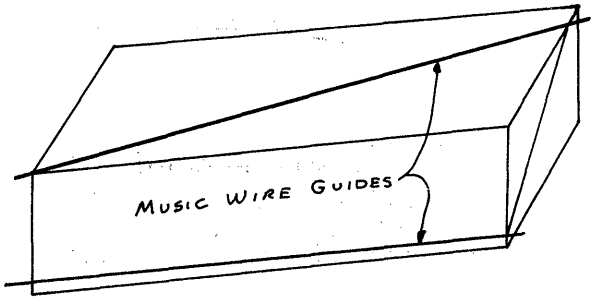
HINTS AND KINKS

Prop Block Hints

Many of us put off carving prop blocks because of the difficulty in getting the edges of the surface straight and the building surface flat and smooth. Bill Graham suggests that the removal of excess wood from the block can be made easier if straight edges are placed along the carving lines and saw cuts are made at frequent intervals down to the straight edges. A carving knife will quickly remove the segments, leaving very little cleanup to make a first-class surface.



Someone else (we lost the letter, but remembered the idea) suggested that 1/16" diameter music wire be glued into the block along the carving lines. These wires will serve as "runners" for sandpaper wrapped on a dowel, and make it very easy to sand the building surface smooth and level. Of course, these two ideas can be combined to make the blocks quicker and more accurate with less work.



A LOOK AT YESTERYEAR

The June '65 INAV reviewed the results of the 1939 Nats, with the observation that the times were pretty good for then, and that the Juniors were outflying the Open contestants. Curtis Janke adds the following background to the picture: "These times were both better and worse than they look; worse because the ceiling height of the old Grosse Isle site was about 110', or maybe better. It was a more or less abandoned small blimp hangar, with some broken windows, but conditions were usually OK at Nats time. I think that the Nats were held in Detroit for at least three years in a row back then; 1937, 1938 and 1939.

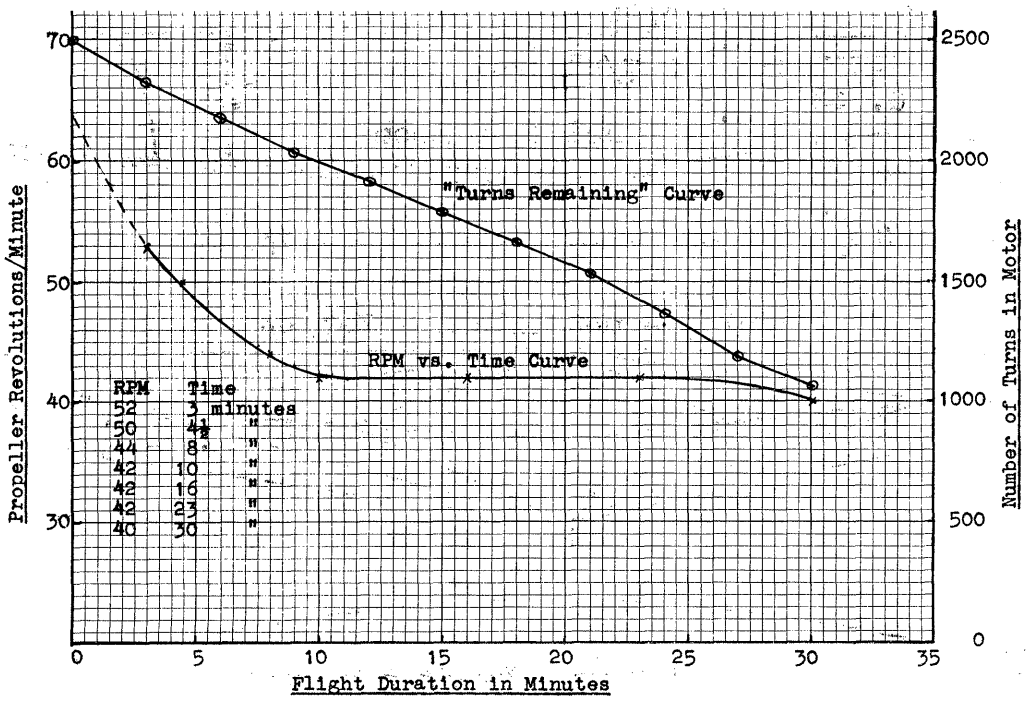
These times were better than they look, however, since they were (believe it or not!) the average of the best two flights out of three. The AMA had decided to do it that way for the outdoor events (come to think of it, free flight events were all that existed at the time) to cut down on the luck factor, and forgot to spell out that this didn't apply to indoor. A month or so later I set a short-lived record in the St. Louis Arena under this rule.

Don't let that lousy time of Pete Andrews' fool you. He had what was at that time a miraculous airplane - it was a "C" tractor, weighing about .050 oz. He used hollow spars on it, and a mike prop, 16" dia., fairly high pitch - it was the first ship I saw with an RPM as low as 60. He made several 25 minute test flights with it that day, which was the best time anywhere, including Lakehurst, and his lousy contest time was the average of two flights, one of which was around four minutes, when the ship stalled around badly out of trim."

THE LAB

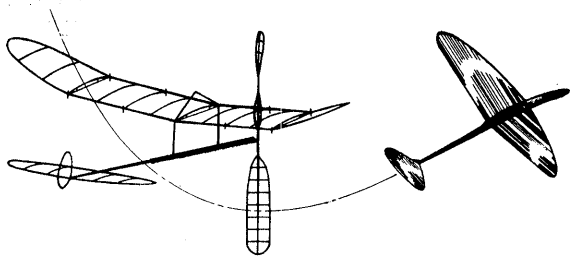
Flight Test Techniques

Bob Champine suggests this method for analyzing prop and rubber combos with an eye to predicting performance. The first step is to count the RPM during flight (see RPM vs. Time chart on graph below) and graph it as shown. On this graph the RPM was extrapolated (dotted line) to cover the time from launch to the first RPM count. Start with turns at launch (2500) to establish the Turns Remaining curve. The curve shown was plotted at three minute intervals thus: The average RPM for the first 3 minutes (reading from RPM vs. Time chart, point "A") is 58. In the first interval, the prop turned 3 x 58 or 174 revolutions, so the second point on the Turns Remaining chart is 2500 - 174 = 2326. Average RPM for the second interval (point "B") is 50; 2326 - (3 x 50) = 2176. The remaining points are plotted at three minute intervals to complete the curve; comparison with similar curves for different motors will facilitate proper choice on motors.



The Voice of N.I.M.A.S. AUG·1965

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****THE INDOOR NATIONALS****

July 26, 1965

Indoor Stick

Junior

1.	Randy Richmond	20:01.2
2.	Eric Vogel	19:07.2
3.	Ronny Ganser	17:03.5
4.	Dan Champine	13:08.6
5.	A. Markiewicz	11:27.8

Senior

1.	Ned Smith	25:50.6
2.	Neil Shipley	14:54.4
3.	S. Stackhouse	2:59.0

Open

1.	Tom Finch	40:59.2
2.	Dick Kowalski	36:43.0
3.	Joe Bilgri	36:42.0
4.	Bud Romak	36:20.0
5.	Ed Stoll	34:46.0
6.	Joe Hindes	33:57.0
7.	Bob Champine	32:48.0
8.	Bill Atwood	31:33.0
9.	Dave Martin	31:24.1
10.	C. V. Russo	29:55.0

Paper Stick

Junior

1.	Randy Richmond	10:44.4
2.	A. Markiewicz	9:24.0
3.	Lynn Adams	8:18.2
4.	W. Wisniewski	6:43.0
5.	M. Richardson	6:38.5

Senior

1.	Ned Smith	14:43.6
2.	Neil Shipley	10:49.0
3.	John Manczuk	10:36.0
4.	Bob Trampenau	10:01.0
5.	James Bradley	6:16.8

Open

1.	Ernie Kopecky	23:23.0
2.	Frank Cummings	21:14.0
3.	Joe Hindes	21:01.2
4.	Wally Mumper	20:57.2
5.	James Richmond	20:31.0
6.	Bill Atwood	20:26.0
7.	John Triolo	20:23.2
8.	Phil Klintworth	20:13.8
9.	Charlie Sotich	18:53.1
10.	Ed Stoll	18:22.2

Indoor Cabin

Junior

1.	Randy Richmond	18:33.3
2.	Ronny Ganser	10:04.0
3.	Jay Krush	1:15.2

Senior

1.	S. Stackhouse	1:52.0
2.	D. Stackhouse	0:53.0

Open

1.	Frank Cummings	28:39.2
2.	Joe Bilgri	23:29.0
3.	Ron Ganser	20:11.8
4.	Charlie Sotich	18:47.0
5.	William Biggs	17:09.0
6.	R. Batterson	15:33.8
7.	J. Krush	8:40.8
8.	James Richmond	7:08.0

Indoor HLG

Junior

1.	Randy Richmond	2:08.8
2.	Bobby Owens	1:49.7
3.	A. Markiewicz	1:40.6
4.	Greg Perryman	1:34.0
5.	Thomas Mills	1:30.2

Senior

1.	John Manczuk	2:01.3
2.	S. Stackhouse	1:58.0
3.	W. C. Armstead	1:50.5
4.	Melvin Gray	1:46.7
5.	Steve Perryman	1:40.7

Open

1.	Larry Conover	2:25.2
2.	Donald Bal	2:11.1
3.	Reid Simpson	2:07.2
*4.	Bob Sifleet	2:05.5
*5.	Ron Higgs	2:05.5

*Tie - Place determined by next highest times.

NATS COMMENTARY

There is a world of difference between the Nats in a blimp hangar and in an intimate site such as Will Rogers Coliseum or the Chicago Armory. The size and distance sort of gets to you - we walked the length of the area set aside for rubber models, looking for the registration desk. It was old home week - probably the largest group of NIMAS members ever under one roof. It took over half an hour to walk approximately 700 feet, renewing old friendships and making new ones; this barely scratched the surface. In the smaller sites you can just look all around and see who is there; in the hangar you may go all day and still overlook someone, only to meet them waiting in line for a timer!

The other differences are less obvious - and have to do with the height of the hangar and the air conditions. Lakehurst is a somewhat unfriendly hangar - those whose models aren't just exactly right don't do very well. That statement may well sound like the raving of a disgruntled low ceiling flier, but the truth is that Lakehurst has resisted stubbornly all efforts to do real time there - the first "40" in Lakehurst history came at this Nats, and the next nearest flight was four minutes behind. Unlike the 1963 Nats, when a few low ceiling fliers managed to finish in the top ten (Santa Ana is a friendly hangar), almost no one without extensive hangar flying experience made the top ten. The air wasn't rough or unusually drafty - just humid and heavy. When the really experienced fliers have trouble getting to the top, then everyone else gets about half-way up.

The models were mostly all similar to those in use in previous years; there were few new ideas. Quite a few models had the Sotich Dram Dip layout, with or without the swept leading edge. Dacron bracing and wire shared the spotlight, there was a little more emphasis on having the microfilm snug or tight, if not stressed. The built-up tail boom made both good and bad impressions, but did perform to expectations. The paper stick event had the widest range of designs and propellor size. Ernie Kopecky's winner sported a 13½ x 21 prop, moderate A/R, "v" dihedral and 105% CG. Wally Mumper's 4th place ship had high A/R and an 18" or 19" prop - with only 2½ minutes difference in the times you can take your pick!

The really startling model was Sotich's new cabin - it looked like a built-up stick and boom, but the usual cross-section appeared to be missing. Then, you look back to where the fin ought to be, and the boom gets very wide and deep (see photo on page 4).. The question of legality of this model didn't arise - his 4th place was made with his 1964 winner - first flight since 1964!

Hand launch glider was the usual hard-fought battle, with many, many entries and a tie for 4th place, settled in the usual "best supporting flight" manner. As usual, there were many Sweepettes, along with the usual range of other designs.

One last bit of comment: Some of the events were not too well supported, and a few trophies went begging. We heard (not officially) talk that some of the events could be cut out. Looking at the results, we really have a very poor arguement to keep cabin - trophies have gone begging every Nats I have record of - which makes 4 Nats in a row. The entry vs. official flights went thus:

Event	Junior Enter/flew	Senior Enter/flew	Open Enter/flew
HLG	36/18	19/13	107/65
Paper Stick	19/14	6/6	55/34
Indoor Stick	10/7	4/3	46/26
Indoor Cabin	9/3	2/2	27/8

We had two Junior and three Senior trophies go unused this year, seven Junior and three Open in 1964, and two Junior and two Senior in 1963. Somehow, we are missing the boat - something needs to be done. The current level of indoor activity is greater than this - but we aren't showing up at the Nats.

****FAI INDOOR FINALS****

July 27, 1965

1.	Joe Bilgri	19:50	25:52	10:20	38:40	9:32	39:39	74:02
2.	Frank Cummings	27:06	32:34	x	25:16	38:06	35:56	74:02
3.	Bud Romak	29:49	34:27	31:27	38:17	32:40	19:30	72:44
4.	Dick Kowalski	32:43	36:20	30:00	33:56	34:58	x	71:18
5.	Ernie Kopecky	35:10	32:14	x	1:23	35:13	35:04	70:23
6.	Carl Rambo	21:25	31:11	32:35	31:42	35:08	35:08	70:16
7.	Pete Andrews	22:40	33:15	x	36:32	32:12	x	69:47
8.	Bill Hulbert	22:35	22:56	9:31	22:15	34:54	34:17	69:11
9.	Bill Atwood	24:31	29:59	32:53	15:03	29:53	32:15	65:08
10.	Jim Clem	27:36	30:06	x	27:03	16:34	31:33	61:39
11.	Ed Stoll	27:00	2:31	26:13	12:00	34:32	21:+	61:32
12.	Tom Vallee	25:34	27:24	x	0:06	19:08	28:28	55:52
13.	Bud Tenny	16:47	20:57	18:05	17:34	27:15	9:12	48:12
14.	Charlie Sotich	22:52	0:04	x	22:26	x	x	45:18
15.	Stan Chilton	x	x	x	7:32	x	x	7:32

FAI COMMENTARY

Long before July 27, 1965, everyone expected the FAI Finals to be a terrific show, and that's what it was. With 15 top fliers from all over the country, this just had to be a good contest.

For those who hadn't flown at Lakehurst, the Nats gave a foretaste of what to expect. To compound the advance feeling of uncertainty, the weather was cloudy and the hangar noticably more humid than the day before. Charlie Sotich's hygrometer showed 60% relative humidity about 9:30 AM, and it is doubtful if this improved later.

Those who knew they would have trouble getting their models high enough (like your editor) began to work on that problem; those who knew the answers began to work up motor sizes and make test hops to chart the drift.

The contest consisted of two three-flight rounds with deadlines at 3:15 PM and 8:15 PM for the last flight of each round. As usual, many people waited until the last minute before taking their flights, hoping for better conditions. The air did get better near the end of Round I, or else the fliers got bolder. None of the earlier flights were over 30 minutes, and by 2:15 only 16 of the 45 possible Round I flights were in. Eleven contestants had made those flights, and Bud Romak was leading by over 9 minutes. By 2:35, Frank Cummings' second flight cut Romak's lead to less than five minutes and Kowalski and Kopecky had posted some good flights. By 3 PM, Romak, Rambo and Atwood had made their third flights and led in that order. Meanwhile, Kowalski had two flights up at once and Kopecky had his second one going, but time was running out for seven of the fliers who would not finish their Round I flights. Before the round was over a rain storm had blown up, which didn't help matters any. When Round I finished, Kowalski led with 69:03, followed by Kopecky with 67:24 and Romak with 65:54. High time for the round was Kowalski's 36:20.

Round II started with a bang - Joe Bilgri's 38:40 was to remain unbeaten until his own last flight, and Romak and Andrews made strong bids with their fourth flights. At 5 PM the top three were Romak, Andrews and Kowalski. In the next hour only Ernie Kopecky made real headway in the race; he moved into second with a total of 70:23. About this time Frank Cummings lost a model - it was involved in a collision with Tom Vallee's model and wandered into a dark corner of the hangar to land unnoticed by a parked aircraft.

At 6:20 PM, Romak, Kopecky and Andrews led the pack; Bilgri needed only about 32 minutes to place and Kowalski needed 33½ minutes. Although it was extremely unlikely that anyone else could make it on a single flight, many contestants had two flights left and two hours to make them - it was still almost anyone's contest.

Frank Cummings took his restart (because of the collision) and it soon was apparent that he would be in contention if the model got back down safely. Joe Bilgri was already up on his last flight, which landed soon with 39:39 and cinched Joe as a team member. Now it was Bilgri, Romak and Andrews - until Frank's model landed at 38:04. Bilgri, Romak and Cummings. Joe advised Frank, "Take a safe 35." Rambo does 35:08 - not enough. Bill Atwood does 32:15 - not enough. Romak's last flight did not improve his total. Kowalski's 5th is 34:58 and now it is Bilgri, Romak and Kowalski. Frank's "safe" 35 was indeed safe and landed at 35:56. The team was now set, even though all the flights weren't in. It wasn't sure, of course, and Romak had quite a while to worry about it before the contest was over. It is to the credit of all those who had flights left that they kept trying - and several made significant gains.

Now that the team is chosen and the long, hard series of qualification trials is over, we can truthfully say it was a real battle all the way. We have a strong team - they had to be to fight the rather poor conditions which prevailed at each site in the whole string of contests. It is appropriate now to thank those who made the program a success - those who ran it. In effect, this was the first time the meets could not be CD'd by participants and we had plenty of help by CD's outside our group. And don't forget the program chairman - Tom Finch. Tom gave up competing to guide the program to a successful end, and did a very good job. So, thank you, Tom; and thank you, each and every CD who worked in the program and made it possible for us all to compete.

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

JOHN HAW, 65-B Parkway Apt., Cherry Hill, New Jersey

NIMAS Awards

For some time the names and times of those who have qualified for NIMAS Awards have been appearing in this space, and no mention has been made of the award certificates themselves. Well, the certificates were designed some time ago by Dave Linstrum, but when he sent them out to be typeset, the printer didn't have the type face Dave specified. The delivery of the type was delayed by a strike in New York, but it has all been settled and the finished art work is in hand. The certificates should start going out sometime in September, if the progress of this issue is any indication!

Help Wanted!

Bob Champine (member of the CIAM FF Subcommittee) is trying to find out ceiling heights (per AMA definition in the AMA Rule Book) of Cat. I and Cat. II sites in the Unites States. The object is to arrive at a realistic ceiling height definition for the FAI ceiling categories now under discussion. Thus, it would be very helpful if each NIMAS member would send a post card to Bob or to INAV, listing all the sites you regularly use or hope to use. We would like to get a fair cross-section of all sites that might be used for future FAI record trials - so please send the info along promptly. Do not assume that I have it - even though I may have the info, it may well be buried in my chaotic files! Send the cards to:

Bud Tenny
Box 545
Richardson, Texas 75081

Bob Champine
25 Beechwood Dr.
Yorktown, Va. 23490

Anyone outside the U. S. and Canada should send this same info (with a note telling where you got the address) to: Sandy Pimenoff, Oksaneng 7A11, Helsinki, Finland. Sandy is Chairman of the FF Subcommittee, and the time limit is so short that he should get it directly.

Change of Address!

Lew Gitlow (MicroDyne) will be moving in about a month. He has announced that orders placed between Sept. 10 and Nov. 30 will have a 10 day delay, and suggests that orders be placed earlier to avoid the delay.

FAI INDOOR REPORT

CIAM FF Subcommittee Memo

CIAM FF Subcommittee Chairman Sandy Pimenoff recently sent a memo to all members of his committee (Bob Champine is the U. S. member), seeking opinions about various FF and Indoor matters to be placed on the agenda of the Nov. CIAM meeting. Under Indoor, Mr. Pimenoff asked for suggestions for furthering indoor activity under FAI rules. Bob suggested that ceiling height categories be set up, along with two additional model sizes. At this time, the tentative suggestions made by Bob are: Cat. I - 7 meters (22.966'); Cat. II - 23 meters (75.459'); Cat. III - over 23 meters. The additional model sizes suggested by Bob are 45 cm. (17.7") span and 65 cm. (25.59"). If you have comments or suggestions on these ceiling heights or model sizes, drop a line to Bob Champine, 25 Beechwood Dr., Yorktown, Va. 23490.

NEWS FROM AROUND THE WORLD

ENGLAND

Arthur Barr reports that Cardington is not dead, after all. There recently was a well-attended session there, with a few new faces to swell the ranks. This session was the first of two to be held there this year, and the only times given were over 20 minute flights with 65 cm. span models by Arthur and Reg Parham. It seems the talk of scrapping Cardington is dying down, and there is a rumor that a contract has been let to paint the building. At any rate, access to the shed seems to be quite easy, so there may yet be hope that one of the best indoor sites in the world may be with us a while yet.

MISSOURI - ST. LOUIS

At the last word, the McDonnell indoor group have received permission to fly in a hangar (the TWA hangar, presumably at St. Louis Municipal Airport) on a fairly regular schedule. The ceiling is 70' maximum, with a 210' x 125' floor area and a reasonably clear ceiling. Contact Dick Ganslen, 917 Blackberry, St. Charles, Mo. for info about dates and times.

NEW JERSEY - LAKEHURST

For those who are close enough (lucky ones) C. V. Russo is planning a record trials over the Labor Day holiday. To find out when, write C. V. Russo, 143 Willow Way, Clark, New Jersey.

THE PICTURE STORY

Page Four

1. Tom Finch and his "300" - 1st. Open Indoor Stick.
2. Eric Vogel - 2nd Junior Stick, 170 Sq. in. FAI, built-up boom.
3. Charlie Sotich and his "different" Cabin model.
4. Ron Ganser and Me-R-Ganser. The stab warp hindered performance, but it still flew nicely.
5. Wally Mumper - 4th Open Paper Stick. Note large prop.
6. Two unidentified Juniors ready a Paper Stick flight.
7. Ronny Ganser - 2nd Junior Cabin.

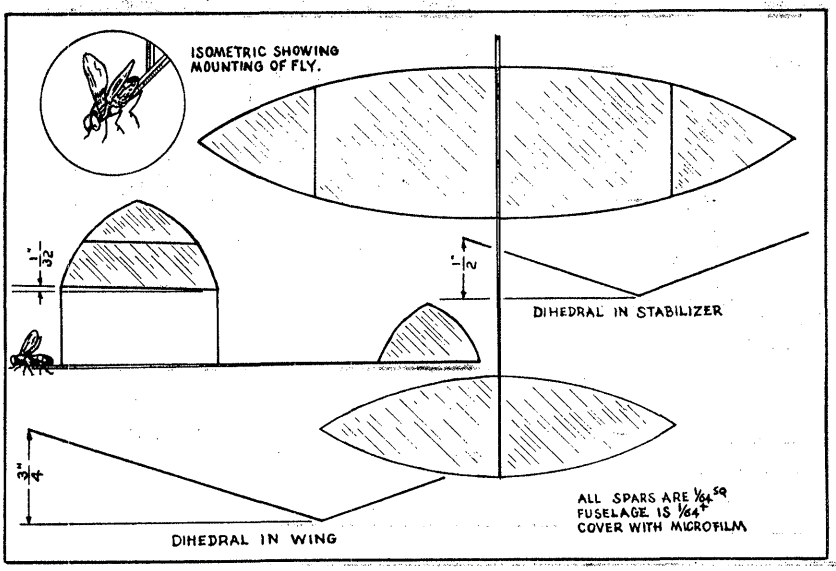
Page Five

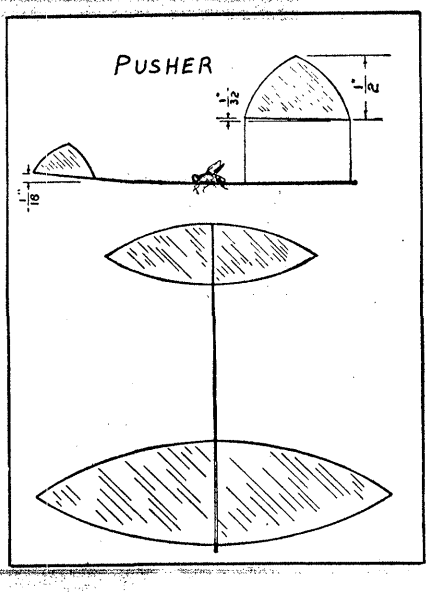
1. Joe Bilgri and the #1 FAI model.
2. Frank Cummings prepares a test hop.
3. Bud Romak launches his 3rd place winner.
4. Dick Kowalski - First runner-up.
5. Pete Andrews (l.) and Ernie Kopecky watch Ernie's model on a test hop.
6. Bill Atwood holding, Frank Cummings winding.
7. Ed Stoll launches a test hop.
8. Charlie Sotich during a tense moment.

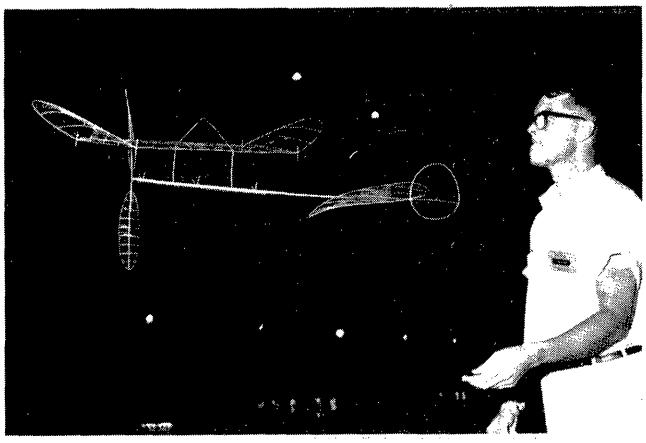
CHANGE OF PACE

Fly-Powered Models

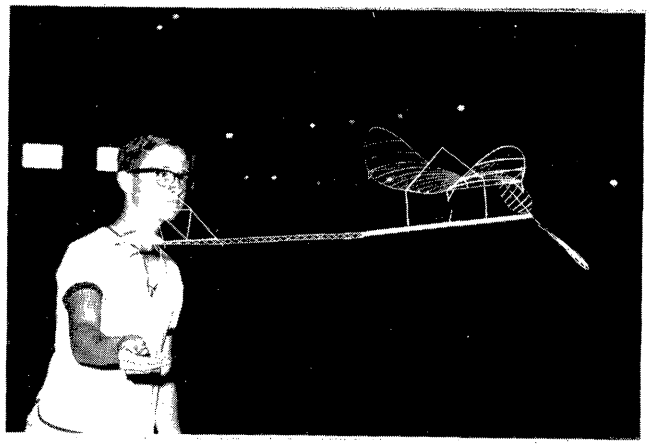
At least twice in past history (so I'm told), M.A.N. has had articles on microfilm models which were powered by flies. Apparently any kind of fly is satisfactory, as long as it is an active specimen. The drawings shown here have been reproduced from the August 1940 M.A.N., and the article was "Models On The Fly" by William B. Schwab and Joe Elgin. Model construction is conventional and the author suggests that test glides be made with an inactive fly or a 1/8" cube of balsa as weight. The flies are glued in place, but it probably would be a good idea to limit the amount of glue. I have noted that some modern thinners and solvents are effective insecticides when in contact with the varmint, and glue might be too. Thanks to Edgar Seay for the loan of the magazine.



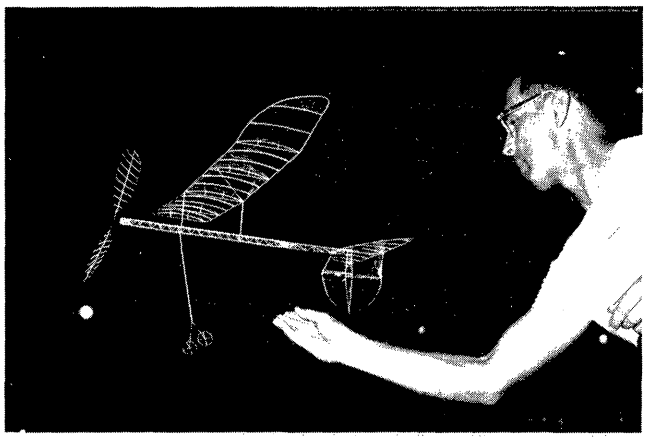




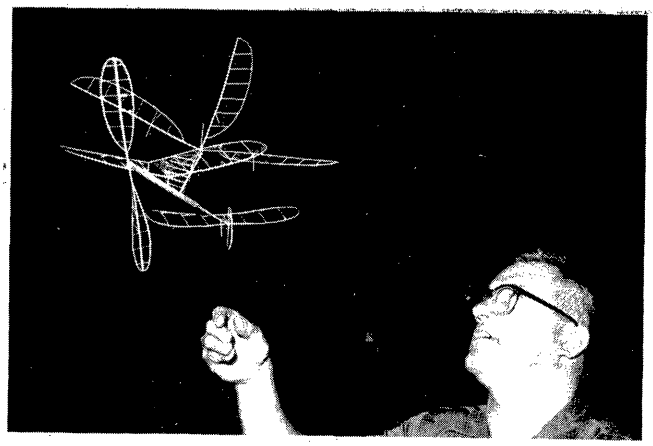
1



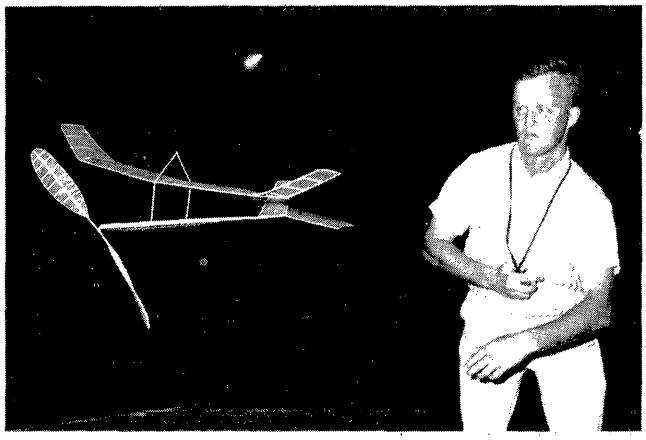
2



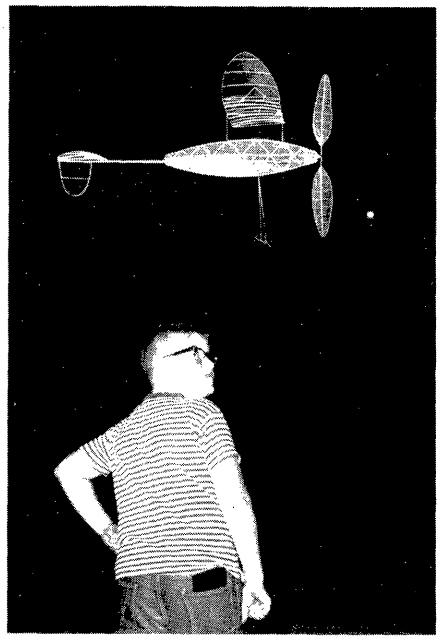
3



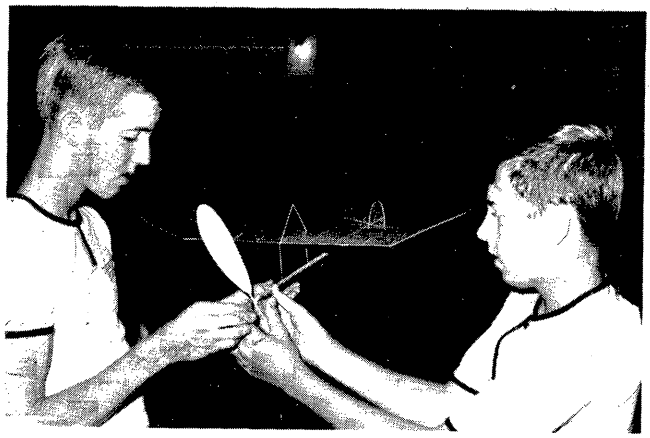
4



5

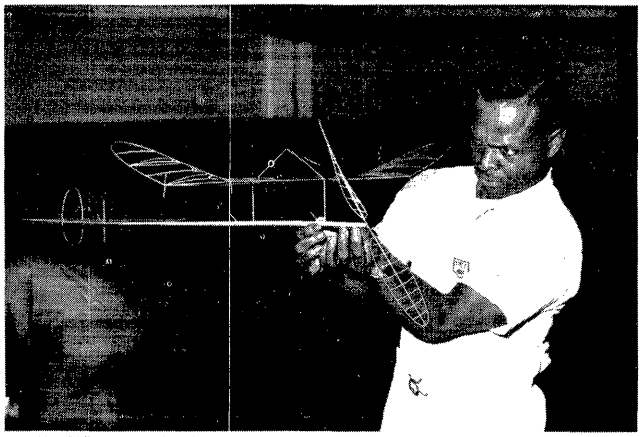


7

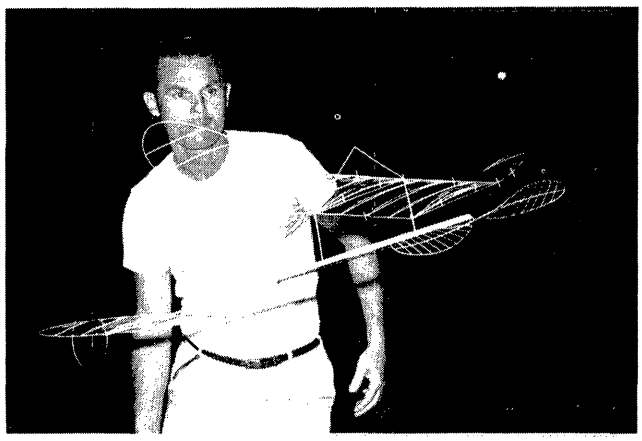


6

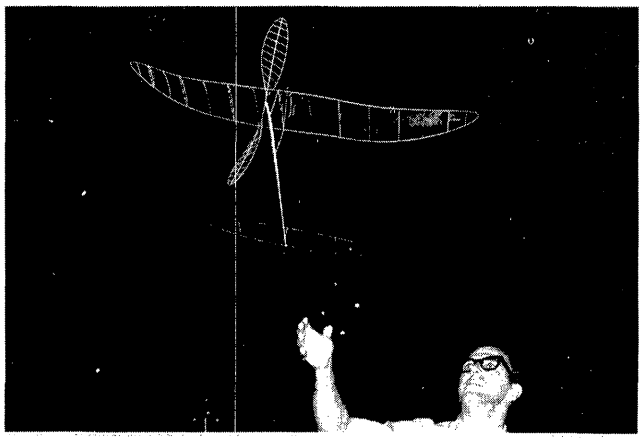
1



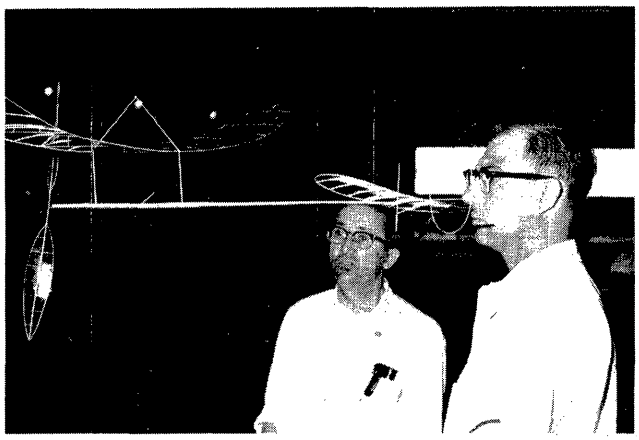
2



3

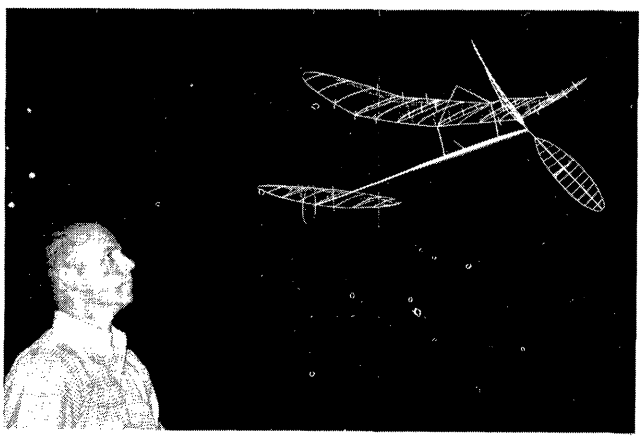


4

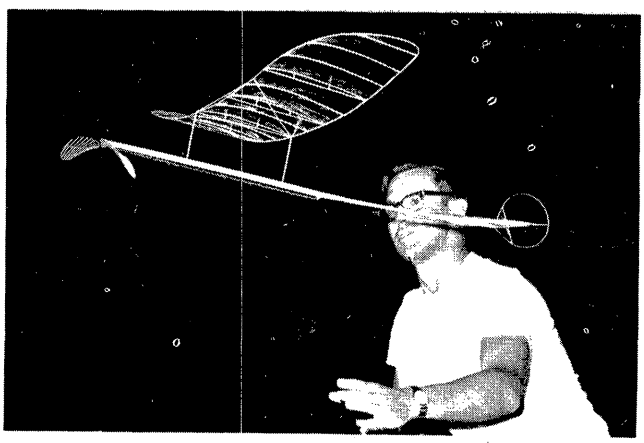


5

6



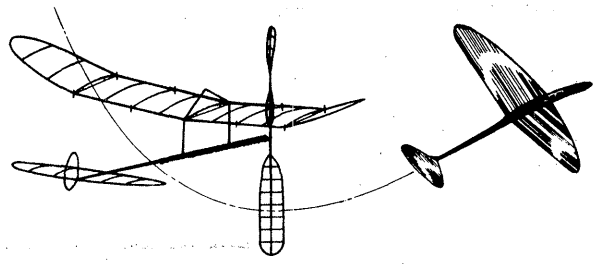
7



8

The Voice of N.I.M.A.S. SEP·1965

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

M. W. GIESKIENG,JR., 730 Mocre St. #2, Lakewood, Colo.
JAMES R. KELLY, Rt. #2 Box 490, Yorktown, Va. 23490
JESSE SHEPPARD, 5312 Odessa, Ft. Worth, Texas

Belated Photo Credits

Last month's issue contained a picture coverage of the Nats and the FAI Finals which drew many comments with high praise for the photo work. To my shame and disgust, I neglected to give a credit line for the photos! My most humble apology to Bob Clemens, who took vacation and journeyed to Lakehurst to take these pictures. Thank you, Bob, for a job well done!

Nats Aftermath

First off the bat, another apology coming - due to an oversight when I recapped the Nats results (official handouts list only five places), I completely missed John Triolo's 34:34 flight, which put him in 6th place. He said, "It's bad enough to miss out on placing by 10 seconds, but to not be listed in the top ten is too much!"

And then there is the info I missed out on by being in the wrong place at the right time: Larry Conover's winning HLG was a Flanger (what else?); see M.A.N. Dec. '63 for the outdoor version. And Frank Cummings arrived the Friday before with the covering on his models in bad shape - vibration had caused the ribs to saw through the film in many places. Starting from scratch, he poured film and recovered the models, finishing up Sunday PM. I had seen these models in February, and a close look at them at the Nats showed no signs of repairs!

Who Wants Cabin?

After my comments about the lack of official flights in the Cabin events at the Nats, a few of you wrote to say that perhaps Cabin should be dropped from the Nats schedule and retained as a record event. However, quite a few more of you emphatically stated that Cabin should remain. I agree. I wasn't promoting the demise of Cabin at the Nats - just sounding a word of warning. Since I never manage to get two models trimmed out at once, I'm almost sure not to complicate the problem by building Cabin. I can understand why few of the Cabin entries get flown, but this is no reason to drop the event.

Preview - Things To Come

A hearty welcome to Hewitt Phillips - his article on measuring prop efficiency is a good one. Would it be possible for other NIMAS members to follow his lead and contribute similar articles on their specialty? How about an article winding rubber motors for a start? This is something we all do, and most of us not too well. Then, there is the proper choice of wood; proper glue applying techniques (most of us use too much glue); the list could go on and on.

Meanwhile, numerous requests for information about microfilm - all aspects of the topic from formulation to handling and covering techniques - have been received. As a result, I have tried to gather a variety of material from many sources, and this will be organized in some fashion in the months to come. Other requests covered construction hints and kinks, and the resulting material will range from how-to-do-it to refinements on the usual way of doing things.

Please note that the contents of future issues are based largely on requests, and that each of you can get into the act by making requests and contributions.

Loof Lirpa Strikes Again

1313 Frandlegooper Way
Posenose, Rhode Island

Dear Bud,

Thanks for sending me a copy of Yam Nevesytnewt's letter. I am happy to see he also noticed the "Vortex Focuser" effect. I regret that he failed to benefit from recent advances in the state of the art by getting the aerodynamic improvement of low Aspect Ratio.

As you are well aware (by painful experience) the idiot who calls himself the "Lone Renger" finally did something worthwhile by designing the "Boxy" HLG. (See State Of The Art - Ed.) Boxy utilizes a low Aspect Ratio to raise the Reynolds Number closer to the turbulent region while reducing tip losses by the high taper ratio.

Since Renger is a fink he doesn't believe in Vortex Focusing, and Boxy is not designed to optimize its Vortex Focus Quotient. You will notice Boxy does use sweepback for improved roll-out, and a backward curving highpoint line to approximate elliptical dihedral.

As the Boxy is an indoor design, Renger can get away without Vortex Focusing and still have a winning design. I predict that for outdoor flying Vortex Focusing will be the biggest thing since the invention of CLA.

Sincerely,
Loof Lirpa

INDOOR RULES

The July '65 Issue of INAV carried the text of a rules proposal which would update the indoor rules (Section 8) to conform to modern practice and competition. Hoping to evoke either a storm of protest over the fairly large number of changes or a number of favorable comments from those in favor, I asked for suggestions. I got a few, split evenly between those in favor and those "agin" the proposal. With this proposal (not yet submitted to the Contest Board) and with those which have been submitted (see May '65 INAV for summary), the key to what to do is to watch Model Aviation and see when a proposal is published to start the study period. Then, no matter which way you feel about a proposal, contact your FF Contest Board member (consult the rule book for a list of CB members for your AMA District) and tell him how you feel. If you don't feel strongly enough about the proposal to do this, then don't gripe if you don't like what rules are developed!

POSTAL CONTESTS

In what is probably the first international indoor postal meet, the D. C. Maxecutors and the Wellington club in New Zealand recently completed the first round. By prior agreement, the events were HLG, Easy B (N.Z.) vs Maxecutor Easy B (18" max. span, 3½" max chord) and N.Z. 18" Microfilm vs. AMA Class B. The results: (38' sites)

New Zealand		Maxecutors	
HLG			
John Malkin	1:07.8	Bill Lee	1:01.9
		George Marshall	1:00.8
		Tom Vallee	1:00.5
Easy B			
John Malkin	6:19	Tom Vallee	9:52
Brian Roots	5:03.1	Bob Randolph	7:42
Class B			
John Malkin	8:24	Bob Randolph	11:08.2
		Tom Vallee	6:12.5

NEWS FROM AROUND THE WORLD

AUSTRIA

The railway station in Salzburg has been put to good use lately as Manfred Koller and his wife exercise his 35 cm. span model. The railway station is about 15 meters high, and readily available - after midnight each night! One recent session ended at 3 AM after Manfred pushed his times up to 7:04 - very good time for a model which approximates our Class A ROG.

ENGLAND

Ron Draper reports that another Cardington session was held August 29, again with most of the regulars and a few new faces. Unfortunately, one of the doors was open about 12" and the outside winds caused a lot of variable drift. Top time was by Ray Monks at 27 minutes, followed by 21½ minutes by Ron. The situation continues to be good with respect to using Cardington, and it seems likely they will be able to have 4 or 5 sessions a year. There is some possibility that another session will be held Sept. 26 - let's hope that the conditions are better!

INDIANA - KOKOMO

The Kokomo Aero Team is entering the 5th season of indoor flying at Bunker Hill AFB, and the first session is supposed to be October 17. The events are usually HLG and Easy B, along with a spirited competition in Scale. Other sessions are tentatively scheduled for the third Sunday of each month. Contact Chuck Borneman, 1401 West Taylor, Kokomo, Ind. 46901 for details.

TEXAS - FT. WORTH-DALLAS

Plans are afoot to start indoor sessions much earlier this year than usual, with a new wrinkle. Special events and classes are planned for youngsters, and it is hoped to extend the lower age limits down to at least 6 years or younger by using nickel gliders in special events.

STATE OF THE ART

"Boxy" is the present holder of the Cat. I Open HLG record at 0:54.5, set by Larry Renger during a visit to Texas. He went back home (Los Angeles) and later set the present high time for the design (0:33.5) at Wilmington Recreation Center.

In Larry's hands Boxy handles very nicely, flying left-left with immediate roll-out at the peak of the launch. It appeared to be very easy to aim the glider at a roll-out point, and it handled well during all phases of the flight. The local fliers thought I over-did the Southern hospitality, since Larry was staying here and used some of my wood for the glider, then beat us all at the contest! Why is it called Boxy? That is a deep, dark secret that has nothing to do with the shape of the model!

MEASUREMENT OF PROPELLER EFFICIENCY ON INDOOR MODELS

by Hewitt Phillips

Most indoor modelers will agree that propeller efficiency is important. In fact, many hours are spent discussing the merits of a particular diameter, pitch, airfoil, planform, etc. Yet how many of these builders can show quantitative data to back up their arguments? Actually, measurement of the efficiency of an indoor model propeller can be done quite easily and with very simple equipment.

First, let us state what we mean by efficiency. The purpose of a propeller is to convert power supplied in the form of the torque of a rubber band turning a shaft to a useful power in the form of a thrust pulling a model through the air at a given velocity. The efficiency is simply a measure of how well the propeller does this job. That is, it is the ratio of the thrust power produced to the torque power supplied.

A review of the basic concepts of work and power is

(CONT. PAGE 4)

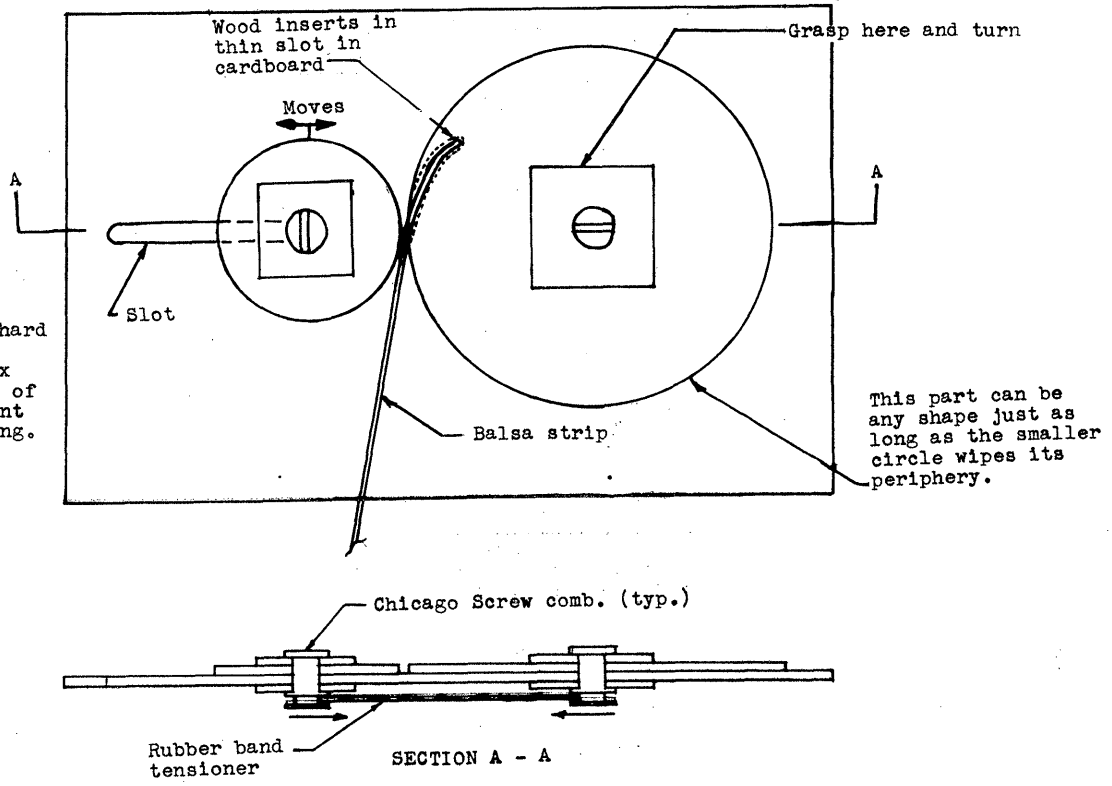
HINTS AND KINKS

Easy Outlines

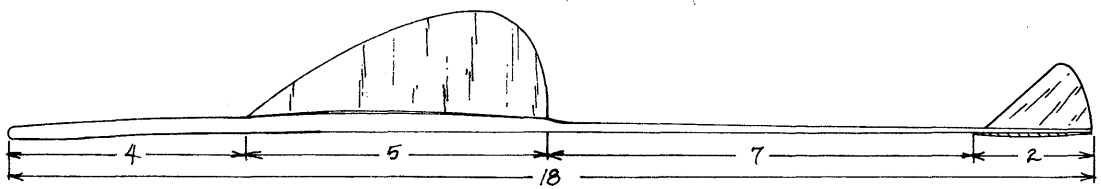
The gadget shown below was designed and developed by Don Larsen of the McDonnell club in St. Louis; the sketch and a working model was sent in by Dick Ganslen of the same club.

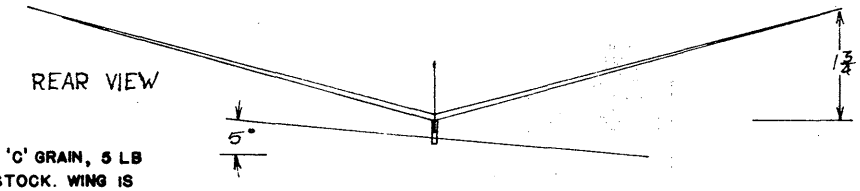
The basic idea is to mechanically form surface outlines from balsa strips that have been soaked in water. The device is drawn with a circular form like that used for trailing rudders, but Dick says the shape of the form is limited only by the requirement that the movable circle be able to touch the form all around. Hard cardboard can be used for all the pieces, but the edges of the forming roller and the form should be waterproofed with glue or wax to preserve the shape and keep the wood strip from sticking.

The method of use is this: soak the strip of balsa in water in the usual manner, wedge one end in the slot in the form and start turning the form. As soon as the strip moves between the roller and form, a smooth, even tension and pressure is applied to the strip. Continue to turn the form until the strip is all around the form, and leave the strip on the form until it is dry. It may be necessary to adjust the tension of the rubber band the first few times it is used - thereafter it should not be necessary to change it.



1. All material is hard cardboard.
2. Apply glue or wax around perimeter of circles to prevent wood from sticking.



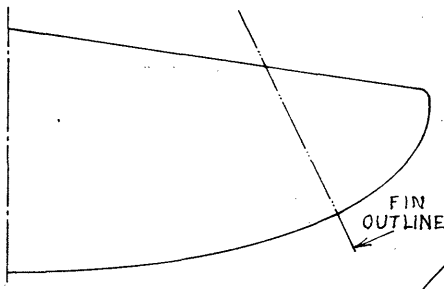


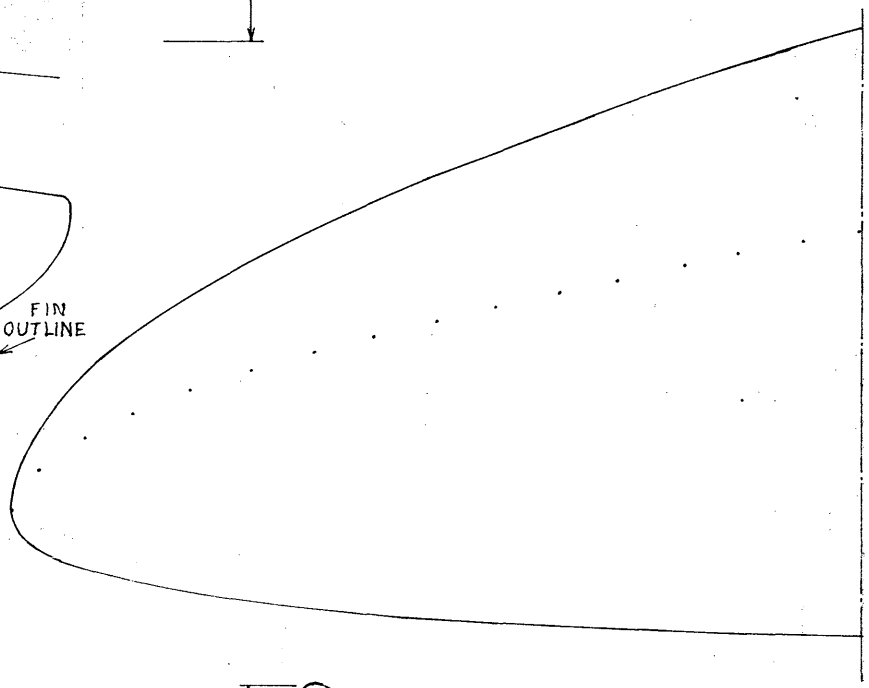
WING: 1/16 SHEET. 'C' GRAIN, 5 LB OR LIGHTER STOCK. WING IS CUT HALF WAY THRU AT HIGH POINT & BENT TO 1/16 UNDERCAMBER.

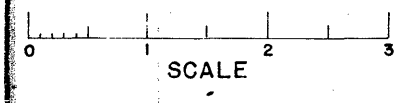
STAB: 1/32 SHEET 'C' GRAIN, AS LIGHT AS POSSIBLE

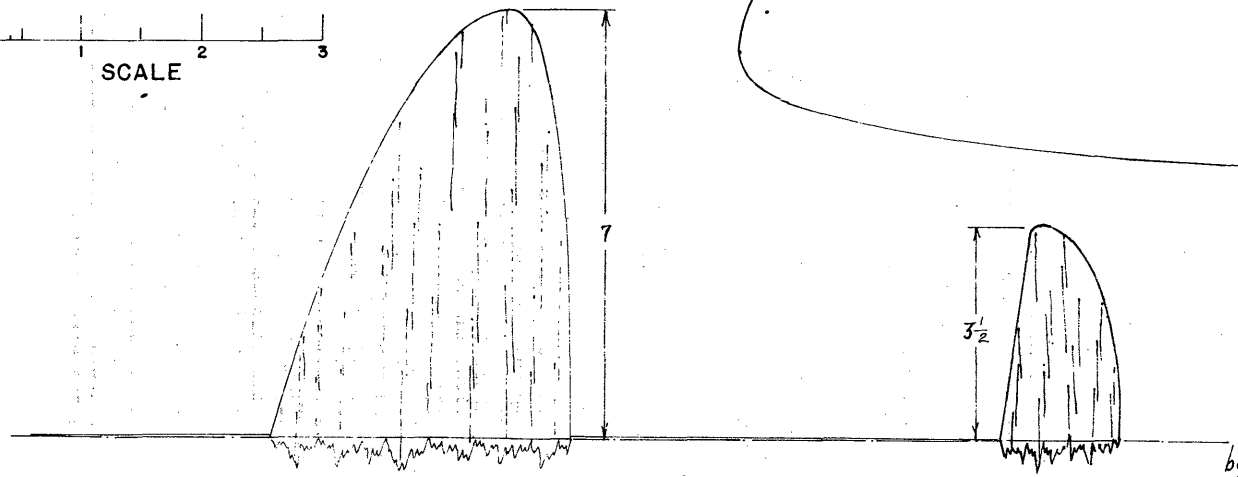
FIN: 1/100 SHEET AS LIGHT AS POSSIBLE

FUSELAGE: 1/16 SHEET, ROCK HARD. TAILBOOM TAPERS FROM 1/8 X 1/16 TO 1/32 SQUARE









Boxy

by The Lone Renger

desirable in order to understand the procedure of measuring propeller efficiency. Work is simply Force times Distance. The distance, however, must be measured in the direction of the force. A few simple examples will make this clear. First, consider a man pushing against a wall: (see Fig. 1) He may get tired, but he does no work in the scientific sense because the force he exerts does not move through any distance. A pulley and a weight could be rigged up (see Fig. 2) to do the same job and could keep applying the force indefinitely without using any fuel because no work is involved. Next consider a boat towing a water skier (Fig. 3). The towrope does work on the skier equal to the force times the distance traveled, and the boat has to continuously use fuel because work is being done. Finally, consider a wagon rolling down an inclined plane (See Fig. 4). The force of gravity does work on the wagon equal to the weight of the wagon multiplied by the change in height. This vertical distance, rather than the distance along the incline, is used because the distance has to be measured in the direction of the force. This same principle will be used later in connection with a glide test of a model.

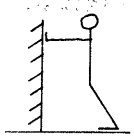


FIG. 1

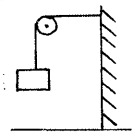


FIG. 2

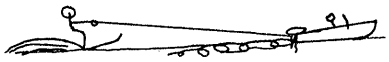


FIG. 3

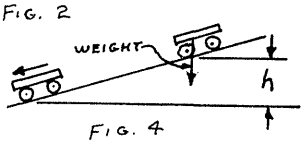


FIG. 4

Next, consider the concept of power. Power is the rate of doing work. It is well known that a more powerful motor must be used to pull the water skier at a higher speed. This is because the work done in travelling a given distance is expended in a shorter time, and therefore the rate of doing work is higher.

A few words about units will conclude this physics lesson, and we can continue with the subject of measuring propeller efficiency. If distance is measured in feet and force in pounds, then the work is expressed in foot pounds. For indoor models, however, we will find it more convenient to measure distance in inches and force in ounces, so work will be expressed in inch ounces. If the water skier mentioned previously is pulled 55 feet in one second with a force of 10 pounds, then the power required is 550 foot pounds per second. Note that we can also get this answer by multiplying the force, 10 pounds, by the velocity, 55 feet per second. Thus power is force times velocity. It happens that 550 foot pounds per second is exactly one horsepower, by definition. Here again, either horsepower or foot pounds per second are rather large units for indoor model calculations, so we will measure power in inch ounces per second.

We must now find methods to measure the power required to pull the model through the air (the so-called thrust power) and the power to turn the propeller. The ratio of these two quantities is the propeller efficiency. Consider first the power required to turn the propeller. Our examples so far have considered power generated by a force pulling in a straight line. In the case of the propeller, however, the power is generated by a twisted rubber band turning a shaft. To measure the twisting tendency of the rubber motor, we use the quantity "propeller torque." Propeller torque may be measured by measuring the force exerted at a known radius from the hub (See Fig. 5). The torque is the force multiplied by the radius. It does not matter what radius we choose. If we put the balance twice as far from the hub, the force will be half as great, so the torque remains the same. Now consider the work done by the propeller torque as the propeller turns one revolution. Remembering that we must measure distance in the direction of the force (See Fig. 6), the distance through which the force F moves is $2\pi r$, where r is the radius at which the force is measured (π is 3.14). The work done in one revolution is therefore $2\pi Fr$. But the torque, Q, is Fr. Therefore the work is $2\pi Q$.

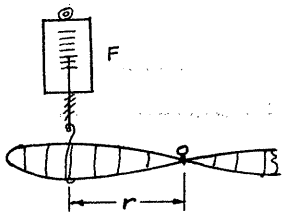


FIG. 5

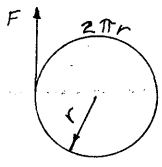


FIG. 6

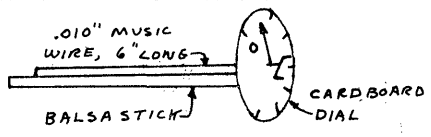
If the propeller turns at the rate of n revolutions per second, the work $2\pi Q$ is done n times per second. Therefore the rate of doing work is $2\pi nQ$. But, by definition, this is the power input to the propeller, one of the quantities needed in determining propeller efficiency.

The other quantity needed in determining propeller efficiency is the thrust power, which is equal to the propeller thrust times the airspeed. The propeller thrust, however, is a very difficult quantity to measure in flight. Some other approach to measuring the thrust power must therefore be used. This problem may be solved by noting that the power required to fly the model in level flight is exactly the same as the power required to cause it to glide, assuming that the adjustment of the model remains the same. The only difference is that in a glide, the power required to fly the model comes from gravity rather than from the rubber motor. We have already seen that the work done by gravity on a wagon moving down an inclined plane is the weight multiplied by the change in height. In exactly the same way, the work done by gravity on the gliding model is the model weight multiplied by the change in altitude, and the power is the weight multiplied by the rate of change of altitude, or in other words by the sinking speed. The thrust power in level flight may therefore be written WV_s, where W is the weight and V_s is the sinking speed. Finally, summarizing the formulas developed, the propeller efficiency is:

$$E = \frac{WV_s}{2\pi nQ}$$

The experimental procedure for measuring propeller efficiency may now be described as follows. It is assumed that we have an indoor model which has been properly adjusted. First, weigh the model complete with rubber. Next, remove the propeller, but keep the rubber on the model. Put a few turns in the rubber and hook it over the front thrust bearing. Replace the propeller by an equivalent weight in the form of a small lump of clay, carefully weighed to equal the weight of the propeller. The model is now ready for glide tests. Simply launch the model from a convenient altitude, say 6 feet, and measure the time required to reach the floor. The height divided by the time gives the sinking speed.

Now replace the propeller and wind the rubber. Allow the model to fly, without letting it get out of reach, until it just flies level. Now measure the number of revolutions per second made by the propeller. (Note: when timing the propeller, start the watch on the count of zero, otherwise the first revolution will be missed.) Next, catch the model and measure the propeller torque. For this purpose, a small torque meter which clips over the propeller is most convenient. Two designs for such meters are shown below:



These meters should be calibrated to read torque in inch ounces by hanging known weights at known distances from the shaft.

We now have all the necessary data to determine propeller efficiency. A typical example is worked out below to illustrate the calculations required.

Weight of model - .095 oz.

Sinking speed - 6 feet in 17.2 seconds.

$$\frac{72}{17.2} = 4.19 \text{ in. per sec.}$$

Propeller speed - 58 revolutions in 60 sec.

$$\frac{58}{60} = .968 \text{ rev. per second}$$

Torque for level flight - .13 inch oz.

Thrust power = .095 x 4.19 = .399 in. oz. per second

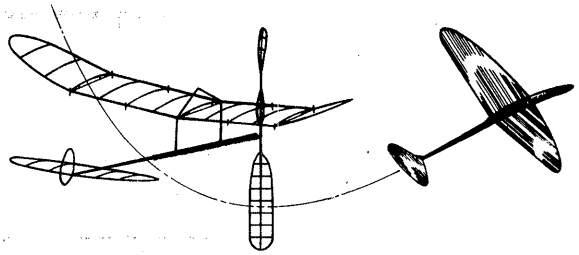
Power of rubber motor =
2 x 3.14 x .968 x .13 = .788 in. oz. per second

$$\text{Propeller efficiency} = \frac{.399}{.788} = .506 \text{ or } 50.6\%$$

Let's bring out those stopwatches and slide rules, and get some figures to prove the arguments on propeller efficiency!

The Voice of N.I.M.A.S. OCT·1965

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

JIM RICHMOND, 131 Pamela Dr., Bensenville, Ill. 60106
AL ROHRBAUGH, 1902 East Fairfax, Ft. Wayne, Indiana

Recent Publications

The November '65 M. A. N. has superb coverage of the '65 Nats, including very good coverage of both the Indoor Nats (with 9 pictures) and a report on the FAI Finals. Unless I missed seeing reporters from other magazines, M. A. N. is the only one interested in seeing that the FAI Finals was covered, so this should be the only report in print. We are very indebted to Walt Schroder for his interest in Indoor and the support we get, all the time, does more for our hobby than any other publication. We should, in turn, support M. A. N. any way we can.

New Materials!

The May '65 INAV suggested that Juniors use stretched dacron sewing thread for their first bracing efforts. At long last the addresses of the distributors turned up:

L. Fisherman & Son
Baltimore, Maryland

W. S. Leopold
Los Angeles, Calif.

Hamner Bros., Inc.
St. Louis, Missouri

The sample furnished by American Thread Co. was described as D-15 Left (Z) Twist, is .0035" in diameter and weighs .0002 oz. per foot.

Back Issues?

There are approximately 25 back issues available for those who would like to fill out their files. This includes all of 1965 to date, all of 1964 and several from 1963. NIMAS members pay 45¢ postage and handling, all others pay 10¢ per issue. It is more convenient for me if the payment is made in stamps, but cash is acceptable.

Books For Sale

Just as a reminder: Frank Zaic's 1964-65 Year Book is almost ready. The contents: 34 articles and 200 plans in 224 pages; these include 5 articles on indoor topics and 20 indoor model plans. The real interesting article for indoor fans will be "Microfilm History" by J. P. Glass - the man who was there. Order your copy now by sending $5 to Frank at Box 135, Northridge, Cal.

For anyone who is just starting indoor, or for anyone who is working with a group of people learning indoor, there is a book which covers all the basic points and a few of the advanced techniques. This is Lew Gitlow's "Indoor Model Building and Flying", which costs $1.50 postage paid anywhere. Note: Lew (and MicroDyne) can be reached at the new address: P. O. Box 416, Leucadia, California 92046.

National Free Flight Society

Dick Black and Carl Fries are hatching a wonderful idea - a free flight society within the framework of AMA in the same manner as NIMAS. This will be an enormous undertaking, but should be tremendously beneficial to all model activity. To quote my good friend Johnny Clemens, who serves as Publicity Manager for the Nats every year, "Model airplane activity is like a lake; anyone who contributes to the activity adds a little water to the lake and the level of the whole thing rises." I feel that the NFFS will do just that; many of us will want to join this group, and I will make available news of this new organization as it is available.

FAI INDOOR REPORT

Team Manager Appointed

Tom Finch has been appointed as Team Manager for the 1966 FAI Indoor Team, which officially terminates this year's team selection program. We wish Tom and the team the best of luck, and feel that we have chosen a strong team and a capable manager.

1966 Indoor World Championships

It is sad to relate, but the 1966 World Champs is in a precarious spot. It is deemed certain that the November CIAM meeting will adopt a rule which automatically removes an event from the world championship schedule if it can not be held twice in a row, either from lack of a host country or from lack of entries. The 1964 Champs were cancelled because there were less than the required five entries. Now, Czechoslovakia has withdrawn their offer to host the 1966 Champs because their site has not proved to be satisfactory. We are very close to the deadline for offers to host an event, and there are no offers to date. The English are trying to get Cardington again, but there are doubts about the effort's success. The United States is prepared to offer to host the event as a proxy-flown affair for those who will send teams, but we must have five entries if we are to retain the Indoor World Champs as an event. It cannot be stated too strongly: Any country that is able to field even one entry, either in person or by proxy, and fails to do so, may be responsible for the loss of FAI Indoor. There are at least 10 countries with some degree of indoor activity and possibly others which might have activity we don't know about. From all these countries it should be easy to get five entries, but apparently not.

A LOOK AT YESTERYEAR

The Stout Trophy

Frank Ehling passes along the following information and questions:

Does anyone know the original Stout Trophy rules? They were as follows:

All models shall be of the R.O.G. type (size optional). Models to weigh not over six ounces complete. They must be able to leave the ground from a platform or strip of linoleum 20 feet in length, laid on the ground. Model must make straight flight within 30 degrees angle. Model to land after passing between post of flags 75 feet on either side of centerline and at a distance of 300 feet from the starting line. A triangle measuring 150 feet in width and 300 feet in length is thus formed with the model starting at its apex. Models travelling outside this triangle will be disqualified.

The Trophy shall be awarded each year to the club, organization or chapter represented by the entrant of the winning model, and this body shall be entitled to the possession of the Trophy until one month prior to to the next succeeding contest, at which time the Trophy shall be returned to the National Aeronautic Association; suitable bond for its proper care and return shall be required by the donee, from each and every person or organization into whose possession the Trophy shall at any time be delivered.

The William B. Stout trophy is now 41 years old. It's original rules have changed in concept as it once was a speed event. How and When did this event change from speed to a duration event?

SIMPLIFIED CABIN STRUCTURE

In the August issue I reported unofficial talk which indicated some thought of eliminating an indoor event at the Nats - and pointed out that Cabin was a likely choice because of low participation in recent years - especially in Junior Cabin. In the flurry of protest and comments which resulted, one thing stood out. It was pointed out that no one even bothers to publish plans of cabin models that Juniors can build - only the "ultra" models. It seems that anyone who has simplified a cabin in the past has kept it pretty quiet - so several of us have been discussing ways to simplify cabin structures so Juniors could build them and handle them later.

Starting with the suggestion that the motor and prop be mounted on a removable motor stick as is done with some scale models, Lloyd Wood sketched these two fuselage designs which should start us all thinking. I think it is important that we apply some thought and ingenuity to the problem faced by both Juniors and beginners of all ages - if cabin is so complicated, why bother?

The design shown in Fig. 1 is the closest to present practice - the wing can be braced in normal fashion using .0035" dacron sewing thread and the tail boom can be built up or solid - even rolled if they have access to a boom form. The deep fuselage makes up the required cross section and minimizes landing gear length. The exact method of keying in the motor stick has not been worked out for either design, but this should not be difficult.

Fig. 2 shows another approach - the wing mounts on four short posts and can be unbraced, braced with balsa struts, or braced with semi-removable dacron thread bracing which hooks to the lower part of the fuselage. Both models can have very light superstructures for the outer fuselage, reinforced at the nose and rear of the fuselage for handling. The major improvement these designs offer for Juniors is to remove the winding hazard from the fuselage and eliminate the removable tail boom, besides the much simplified fuselage structure. Please pass on any comments and suggestions you have - this is a good start, but how can we improve the design?

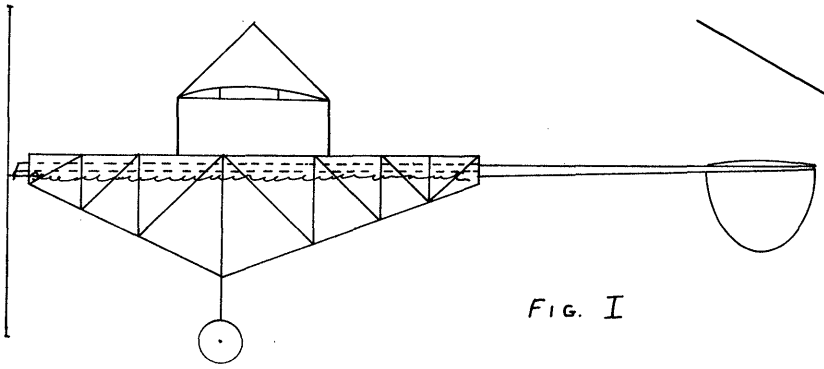
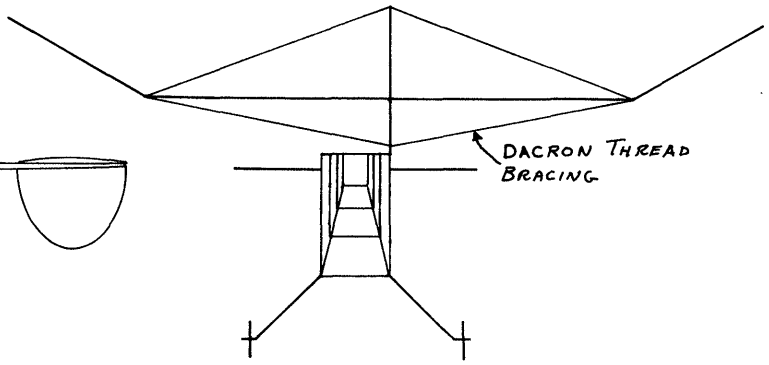


FIG. I



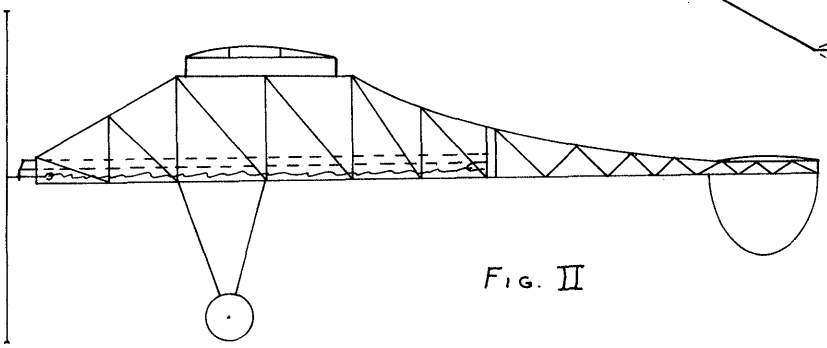
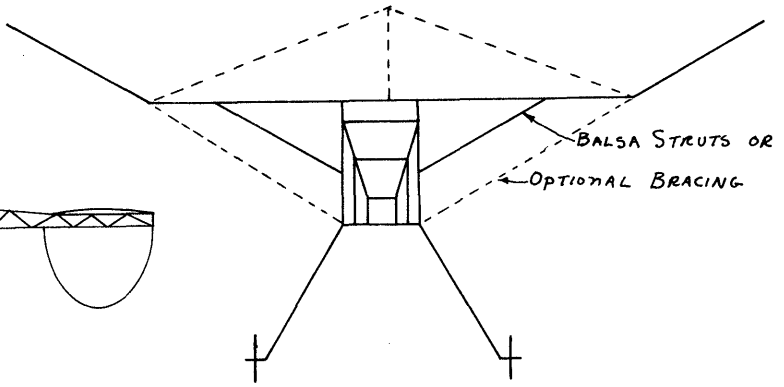


FIG. II



QUESTIONS AND ANSWERS

34. How do you measure the viscosity of microfilm solution?

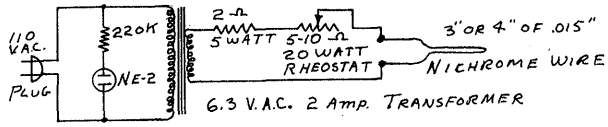
Most manufacturers of nitrocellulose products have developed methods for expressing viscosity of standard nitrocellulose solutions; there may be quite a bit of standardization between companies but I have the following info condensed from du Pont brochure A-6098 entitled "Du Pont Nitrocellulose." This 28 page brochure is very informative - a treasure-trove of info if you're interested in the technical side of microfilm materials.

The falling ball method of viscosity measurement is most likely easily adaptable to our needs; the basic idea is a metal ball (steel or aluminum) of standard diameter and weight dropped through a standard diameter and length glass tube filled with a standard solution of nitrocellulose. The viscosity is expressed as a number which expresses the length of time it takes the metal ball to drop through 10" of solution, measured in seconds. Thus, when we see guncotton (dry nitrocellulose) rated as 5/6 second material, it means that a solution of 20% nitrocellulose, 20% ethyl alcohol, 44% toluene and 16% ethyl acetate was mixed, checked for uniformity, held for 7 hours, set in a constant temperature bath for 1 hour, and then checked for viscosity; an aluminum ball was dropped through the solution and timed, then the time was converted to an equivalent for steel ball.

HINTS AND KINKS

Microfilm Trimmer

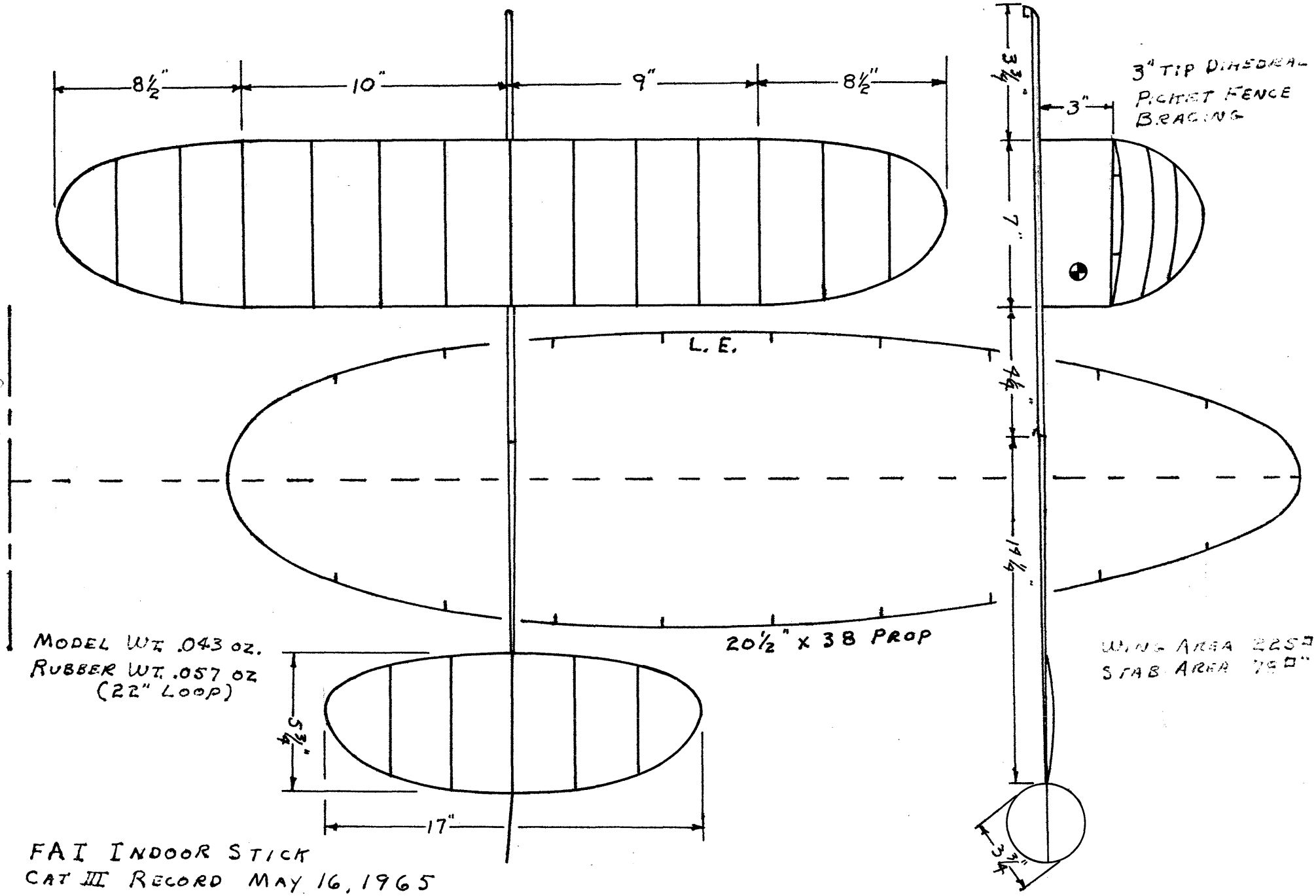
The circuit below was sent in by Bob Champine, and a similar suggestion was made by Ron Ganser. Ron used a length of nichrome wire taken from the igniter coil of a gas clothes dryer, straightened out into a "U" shape. In use, the rheostat is adjusted so the wire is just hot enough to melt the film easily - more heat may ingite the film and spoil your disposition!



STATE OF THE ART

The Model of the Month is the design by Bud Romak which he flew all through the FAI qualification trials to a team slot on the 1966 FAI Indoor Team, in addition to winning all three Cat. III NIMAS Awards.

From a design standpoint the model is a blend of the classic West Coast design (picket fence bracing, 35% stab and slack film) with a longer tail moment arm and a rearward C.G. location to optimize dynamic stability. This model has been a most consistent design - a very good performer and quite dependable.



OCT-65

MODEL WT .043 oz.
RUBBER WT .057 oz
(22" LOOP)

WING AREA 225□"
STAB AREA 79□"

FAI INDOOR STICK
CAT III RECORD MAY 16, 1965
37:26 + 42:01 = 79:27
BUD ROMAN

MICROFILM TECHNIQUES

Introduction

Although the entire science/sport/art of indoor model flying is largely an art that we all practice, the whole business of formulating, pouring and using microfilm is the least subject to rigid definition and analysis. To put it another way, formulas and techniques which work for one person may work poorly or not at all for someone else; in fact, what worked last week may not work today but will work perfectly sometime later on - next week, perhaps. This was brought home strongly to me after the article on taut film. Some people reported that the formula based on Duco cement wouldn't work. I rechecked and got the same results; mixed some more and sent it to them to try. Sometimes they could get good results and sometimes not. Once I was working with a young fellow who could successfully pour only one of four commercial types of film on hand - and that particular brand was one I had been warned about by a very experienced flier - he said it was almost impossible to get film from that mix!

For similar almost incomprehensible reasons, methods of covering and handling are excellent or unworkable, depending on who is trying to do it. So, film formulas which are given later on will be extensively tested, but no guarrantee is attached. The other techniques will be presented in good faith also - one or more fliers have had good luck with them.

Part I - Basic Materials

It is possible to make microfilm out of a variety of different materials, and most of the likely candidates have been tried at one time or another. In fact, it is theoretically possible to make microfilm from any type of material that has available a solvent system such as will be described later on. There are several good films on the market, and it hardly seems worthwhile for most of us to develop more formulas. Since model builders are incurable do-it-yourself types, the information presented in this series should help the dedicated experimenter to make his own film or change a commercial mix to suit his own needs or desires.

The most common base for microfilm is nitrocellulose, in whatever form might be handy. Many formulas printed in the past are based on nitrate dope, which is probably one cause of more trouble than any other single item of film formulation. Each brand of commercial dope starts as nitrocellulose, but each company has different ideas on what to put in it. There are often eight or nine ingredients in dope, most of them unnecessary or harmful to good microfilm. For best results, one should start with pure nitrocellulose and add only those ingredients necessary for the film characteristics we want.

Before we go further, a word of warning is necessary. Another name for nitrocellulose is guncotton - the same basic material is used to make gunpowder. Dry nitrocellulose is extremely flammable and burns rapidly; if it is confined it will generate gas pressure rapidly with explosive violence. Nitrocellulose does not require any outside source of oxygen - it furnishes its own. Most suppliers have a choice of several damping media, and these may also cause problems. For example, du Pont has the options of butyl alcohol, denatured alcohol (ethyl alcohol), isopropyl alcohol and water. For our purposes, the alcohol-wet materials are best, but these are volatile and inflammable. Also, nitrocellulose in any undissolved form deteriorates at storage temperatures above 90° F., resulting in unpredictable and probable unusable properties in the final film. The best and safest way to avoid safety and storage problems is to dissolve the nitrocellulose as soon as you get it. The problem is then one of storing a liquid like dope - much safer. Remember, never store undissolved nitrocellulose - it can be extremely hazardous, and there is no reason not to dissolve it!

Next comes the proper choice of viscosity of the nitrocellulose. The Questions and Answers column in this issue briefly discusses an industrial method of viscosity measurement; here we will consider what the viscosity rating tells us about the final product. Popular usage of this term (viscosity) as applied to nitrocellulose expresses the average molecular chain length of nitrocellulose; ultimately it is an indirect indication of the tensile strength of the final film. The viscosity rating also expresses indirectly the amount of solvent which must be used to produce a mix of pouring consistency. For example, a low viscosity material will produce pouring consistency with 1/5 or 1/6 as much solvent, but the film strength will be only 70% as much as the higher viscosity material. On the other hand, the very high ratio of solvent to solids in a high viscosity material makes it almost impossible to pour enough film on the water to form even gold film; it takes a determined effort to get blue film for props.

For more specific examples, du Pont HC-17 material is rated at 1/4 second viscosity and approximately 9,500 lb. per sq. in. tensile strength; HB-14 is 1/2 sec. and has about 11,500 lb./sq. in. tensile strength; HA-5 comes in at 5 sec. and 12,800 lb./sq. in. The ultimate tensile strength for nitrocellulose film is about 13,000 lb./sq. in., so there is no need to go higher than 5 sec. material for strength reasons. It takes about twice as much solvent per given quantity of 60 sec. material as it does for 5 sec. material, so the ease of handling and pouring will be in similar ratio.

For those who object to having the danger of an explosive material around the house, there is another way to get pure nitrocellulose. Chemical supply houses such as Sargent and W. H. Curtin sell collodian, which is a nitrocellulose solution in alcohol and ether. Collodian is made from high viscosity nitrocellulose, and makes an excellent base for microfilm - after you get rid of the alcohol and ether - both solvents are unusable in film mixes. So, if you start with collodian (be sure to get plain collodian and not flexible collodian which is already plasticized with castor oil and camphor), you need a polyvinyl container with an open top such as a toy sand bucket. Get someplace with good ventilation and no open fire or flames - ether and alcohol is very inflammable and toxic. Pour in about three ounces of collodian and tilt the bucket until the entire inside surface is coated with liquid. Repeat the coating operation every few minutes until the remaining liquid will no longer flow - then set it aside until all solvent is gone. This coating will shrink and pull loose from the bucket - cut it up and dissolve it in the proper solvents. Part II will deal with solvents, and how to blend solvents for specific action during pouring and curing. I am deeply indebted to the Houston du Pont office and Mr. F. S. Horner for making the du Pont brochure A-6908 available to me; much of the above information came from this valuable source.

NEWS FROM AROUND THE WORLD

AUSTRIA

The railway station has continued to be used during the wee hours by Manfred Koller, and he has been joined by Harry Meusburger at recent sessions. Harry was one of the several fliers who were active in 1962 before the station was remodelled and the deadly chandelier removed. Good luck to these fellows - a little competition should make the times increase rapidly.

CALIFORNIA - SANTA ANA

The doors have remained open at the hangar - just enough to prevent serious flying unless the outside weather is almost perfect. Consequently, the activity has died down to the point that several people are somewhat worried about losing the use of the hangar from lack of attendance. Now would seem to be the time for some intensive effort to be applied to helping juniors and other beginners - as a rule drift and turbulent air are less of a problem until the models are well refined.

INDIANA - KOKOMO

The winter series of indoor contests by the Kokomo Aero Team, held at Bunker Hill AFB, will start with one scheduled for October 17, 1965. Subsequent contests are scheduled for the third Sunday of each month through April. The October events will be Easy B, HLG and Scale.

MICHIGAN - DETROIT

Detroit area fliers had a unique opportunity during August. Max Hacklinger took a course in computer science at the University of Michigan, and "talked shop" in the evenings. What an opportunity!

NEW JERSEY - LAKEHURST

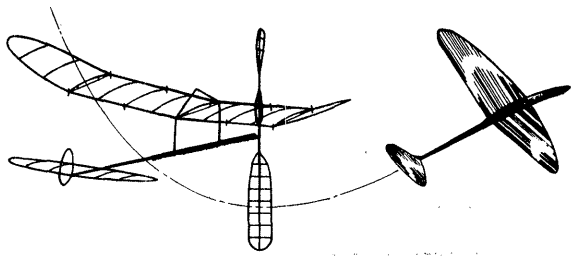
Poor outside weather and a hurricane watch teamed up to keep the hangar open and unusable most of Saturday, and part of Sunday (Labor Day weekend). Nonetheless, two new records were set and Russ Russo turned a high of 36:01.2 with a "D". Ernie Kopecky just missed the Paper Stick record again, using his Nats winner. Other high times were 32:32 by John Triolo, 30:32 by Tom Vallee and 29:50 by Dave Martin. This was the last Lakehurst meet for the year, but plans are being made for 1966.

RECORDS? MAYBE!

LAKEHURST LABOR DAY RECORD TRIALS, Sept. 4-5, 1965
Lakehurst, New Jersey Cat. III 180' ceiling.
Jr. Helicopter - 4:38, Curtis Bernard Lee
Open Autogyro - 5:52, John Triolo

The Voice of N.I.M.A.S. NOV·1965

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

MAX CHERNOFF, 5 Berkshire Rd., Great Neck, N. Y.

AMA Election

When you receive this issue, you will have less than 5 days to get your AMA ballot completed and in the mail, if you have not sent it off already. Each AMA member is obligated to keep himself informed about leaders in his AMA district. When election time comes along, it should be relatively easy to decide upon the best qualified man for offices in your district. Leader members and club officers can help others be informed by holding special club meetings to discuss the candidates and their qualifications and see that the ballots are completed and then mailed on time.

The only national office up for grabs this year is Secretary/Treasurer, and there are four candidates on the ballot. Since I know only one of the candidates personally, I must therefore consider the records of the candidates before deciding where to place my vote. Only one candidate has a broad base of experience in all phases of administration at the national level - Gordon Gabbert. He is also the only one to be in business for himself, which is an excellent qualification for the job. Since I am acquainted with Gordon, I can vouch for his interest in the AMA and feel that he will do an excellent job if he is elected.

Financial Report

This issue marks the start of the fifth consecutive year of publication for INDOOR NEWS AND VIEWS, and the year just ended was a banner year in many respects for NIMAS and INAV. The average monthly circulation was 202 issues, with about 15 of those going outside the North American continent. Incoming mail totalled 684 pieces, and outgoing mail amounted to 988 items. With a total income from subscriptions and donations of $476.78 and expenses of $490.34, the year showed a slight deficit. Only 1964 showed more income than expenses, so we feel right at home! Expenses break down as follows:

INAV Printing	264.33	Mail Postage	64.24
INAV Postage	134.87	Misc. Expenses	12.00
NIMAS Awards (Printing)	15.30		

Once again, thanks to all of you who help out by making material available, answering your mail from me, drawing plans and sketches, writing articles and just plain cheering us on!

INDOOR WORLDWIDE

Since we are worried about getting five entries in the 1966 World Champs, and the CIAM will be considering a proposal which may well greatly increase indoor activity if it is passed, it seems appropriate to review what we know about the present status of indoor flying all around the world. This information has been put together from several sources, and hopefully is up to date.

In the Americas, we find a lot of activity in the U. S., scattered over most of the country. In Canada, there is quite a bit of indoor flying near Toronto, some in Windsor and Vancouver and one or two fliers in Winnipeg. Certainly, the Canadians have the material to make a good FAI team, if there is an effort to qualify the fliers. South of the U. S., no definite information is available about activity, but at least Mexico, Brazil and Argentina may have some fliers.

Down under, New Zealand and Australia had considerable activity before World War II. New Zealand has some very avid and competent fliers now, and John Malkin made a proxy entry in the 1962 World Champs. Australia has several fliers who did mighty good times in the past, but apparently no one is flying of late. It seems that a good push is all it would take to start them flying again.

In Europe and Asia, there are many indoor fliers, and quite a few of them are very good. In England, a regular World Champs entrant, there are several top-notch fliers and slowly growing crop of new fliers who show promise of excellent performance with more practice. Germany has a few fliers of very high skill and two excellent sites in the proposed Cat. II ceiling category - and their teams have always made good showing at the World Champs. In Hungary (entered '61 and '62 Champs) there is a large modelling program with quite a few indoor fliers, but we have little word of their degree of skill. Rumania has a few dedicated indoor fliers; again we have no word on their sites or performance. Finland fielded good teams in '61 and '62, and their model program is well supported by many very good fliers, but there has been little word on their recent activity. Poland has a very active group of indoor fliers, and many of them are very good. The Polish FAI record was recently upped to almost 21 minutes in a 45' site, which is good flying in any league. Russia has interest and activity in indoor, and their fliers may have the skill to be very good World Champs entrants. In Austria there are a few fliers in Salzburg and more in Vienna. The Salzburg activity is centered on 35 cm. size models, flown in a 45' site; no information is available on the Vienna flying. In Holland there are only a few indoor fliers; they are quite limited on places to fly; evidently there are few buildings with rooms large enough for indoor!

There you have it; those eleven countries are known to have at least some indoor activity. Many of them are limited to a poor choice of materials, and the sites are either scarce or low ceiling. These countries are the nucleus of what can be a rapid growth in indoor activity all over the world, and if the U. S. ceiling category and model class proposals are accepted this growth is certain in the near future. Indoor offers a unique technological challenge and fun at very low cost, and it teaches model building skills better than any other event. How can we lose?

FAI INDOOR REPORT

U. S. To Host World Champs?

The U. S. has made a firm offer to host the 1966 World Championships with the understanding that it would probably have to be mostly a proxy-flown event since most European fliers would be unable to enter in person. Thus the U. S. offer is to furnish a site (most likely Lakehurst) and sufficient personnel to fly the proxy entries besides the officiating personnel. It is felt that this offer will be accepted if no European country offers to host the event, so the first hurdle is past and we can concentrate on getting enough entries. Late word has it that Czechoslovakia has not formally withdrawn the offer to host the Champs, but it is expected that this will happen, because of poor conditions in their site.

New Indoor Classes?

Many of us received a questionaire from Bob Champine in September; the results of this questionaire made it clear that most of us would favor addition of new classes and ceiling categories to the international record list. A U. S. proposal will suggest a Cat. I ceiling limit of about 8 meters and a Cat. II limit of 23 meters. For Cat. I only, a new model class of 45 cm is proposed; for

Cat. II only, a 65 cm. model is proposed. This makes two new classes, intended for international records only, and not to be added to World Championship events. If this proposal is accepted, it may well be responsible for an increase in indoor activity worldwide, just as ceiling categories in the U. S. are responsible indirectly for NIMAS, INAV and the present high level of indoor flying in the U. S. Not only are these ceiling heights highly appropriate (most countries have sites which fit these ceiling limits well), but several countries have classes which will fit the proposed classes exactly.

CHANGE OF PACE

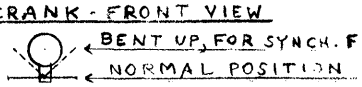
"Birdnik" - Indoor Ornithopter

by Fred Weitzel

Birdnik is derived from ornithopter ideas by Ganser, Parham and Murphy; but the combination as presented is original and effective, we feel. An original feature is the off-phase beat of the flappers. Instead of flapping exactly together (like a bird), or a little out of phase (like most ornithopters), these flap completely out of phase - actually one after the other. This increases the performance both in climb and duration, as is evident from Birdnik's 2 minute plus average (3:00 best) in 30' ceiling despite frequent collisions with girders. This is not bad for a paper covered model. Ned Smith showed what could be done with a lighter version of the design using microfilm covered wing and tail. His has flown 2:59 in a 20' site, its best flight to date. However, the model "as is" is good for small site flying. It is easy to adjust, reliable, highly entertaining and reasonably durable.

Those who wish to experiment with different types of flapping (out of phase and in phase) can do so by bending the crank as shown below. It will be noted that with the flappers synchronized perfectly, a large amount of negtail incidence will be needed to get the climb. Also, the model will be able to fly without the fixed wing. With the flappers out of phase, the fixed wing is necessary - the model won't fly without it. Also, it rocks from side to side a bit; this may detract from the flight appearance for those who want ornithopter flight to duplicate that of a bird. However, we feel that this combination of fixed wing and out-of-phase flappers improves the flight enough to be well worth it.

Birdnik doesn't look so bad in action, at that! In fact, it is an intriguing sight - almost hypnotic in effect. For proof of this we suggest: "build one and see."



MICROFILM TECHNIQUES

Part II - Solvent Systems

Successful microfilm formulation is almost completely dependent upon having the proper choice of solvents, but the solvents make absolutely no difference in properties of the film after it is cured out or aged. The reason for this is that the solvents will all be evaporated when the film has aged.

The amount and kind of solvent must be chosen with three things in mind: First, the solids (nitrocellulose or another basic material) and the plasticizers and other modifiers must be completely dissolved and thoroughly blended together to give material of uniform characteristics. Second, a solvent (or solvent system) is used to change the viscosity (viscosity used here in the normal sense rather than as discussed in Part I in relation to rating of nitrocellulose) to give easier pouring; in this case a blend of solvents is chosen which does not change the pouring and drying characteristics of the solution. Finally, the handling characteristics of the solution can be tailored as desired by adding certain solvents to the mix. To some extent, each person will have a favorite way of pouring which will dictate some changes in the solvent system; in general, microfilm must pour smoothly, spread well and dry reasonably wrinkle-free in a fairly short time.

Solvents are classified according to their speed of evaporation - fast, medium and slow. The Chemicals Division of Union Carbide has a chart (F-7465M) entitled "Solvent Selector" which also lists the various solvents by a numerical system - the higher the number the faster the rate of evaporation. Normal Butyl Acetate is assigned the number 100, and the other solvents are rated in comparison to this. On the same scale, Acetone's rate is 1160, Methyl Ethyl Keytone 570 and Amyl Acetate 42. These four solvents are adequate for home brews, and are the easiest to buy. Acetone and Amyl Acetate are usually available from drug stores, but Methyl Ethyl Keytone and Butyl Acetate may have to be purchased from a paint manufacturer.

The first choice of solvent which must be made is the one to dissolve the nitrocellulose or other base. Generally this choice should be the fastest solvent you plan to use, although a pretty good case can be made to use a blend such as 50% Acetone and 50% Butyl Acetate. In any case, you should keep careful record of the solvents used because they will affect the final mix as will be shown later.

The second solvent choice you must make in brewing a pot of microfilm is the blend (and it must be a blend) of fast, medium and slow thinners or solvents which give the handling characteristics you desire. Fast solvents such as Acetone (1160) and Methyl Ethyl Keytone (570) create a solution which pours and spreads readily, but a mix with only fast thinner will dry too fast, wrinkle, blush and generally be unsatisfactory. So, a medium speed solvent such as Butyl Acetate (100) is added to let the film dry slower on the water. If you add just enough to stop the blush, the film will still spread well but the color is likely to be very uneven. More B/A will help smooth out the color, but you must guard against too much. Excess medium (and slow) solvents prevent the film from spreading and slows up the curing on the water. As a result, a sheet of film may continue to shrink after it is picked up, and then break on the hoop before the water dries off.

The final blend of solvents (and the final film mix) will depend upon the viscosity rating of the nitrocellulose and the amount and kind of plasticizer used. Most likely the final formula will contain about 75% fast solvent, 20% medium and 5% slow (not counting plasticizer). Note that if you start with the nitrocellulose already in solution (and you must not store undissolved N/C because of the danger of explosion as outlined in Part I), you must keep track of the solvents in the nitrocellulose. For example, assume the N/C was dissolved with a 50/50 blend of Acetone and Butyl Acetate. A close accounting of solvent amounts can be made if the N/C is assumed to add no volume to the mix; this is nearly true for normal microfilm mixes since the N/C makes the solvents thicker than before. Now, let's analyze the following formula for solvent content:

Ingredient	Amount	% Solvent
Nitrocellulose	20 cc	0 (actually contains 10 cc Acetone and 10 cc B/A)
Acetone	30 cc(+ 10)	40/53 or 75.5%
Butyl Acetate	0 cc(+ 10)	10/53 or 18.8%
Amyl Acetate	3 cc	3/53 or 5.7%
	53 cc	

One final important matter has not been mentioned about the formula above; the ratio of N/C to solvent in the 20 cc of dissolved N/C. If we consider the two extremes, the problem will be well illustrated. First, if a minimum of solvent is used (one disadvantage is that to completely dissolve the N/C may take 24 to 36 hours even though the container is agitated often) the resulting mix will still be too thick to pour easily and your results will likely be quite uneven and inconsistent. To thin the solution without upsetting the very vital solvent balance, you must add the solvents in the 75.5/18.8/5.7 ratio shown above. If you were in a hurry and used quite a bit of solvent to dissolve the N/C, the result may be a mix so thin that you just can't pour smoothly colored, uniform sheets. The only solution is to add N/C and plasticizer until the solution is thick enough to use. Plasticizer is omitted in the formula above, but is necessary for the final formula; the amount needed is determined by the amount of solid N/C present in the mix and this will be discussed in Part III.

To summarize, a successful microfilm batch will contain fast, medium and slow solvents in approximately 75/20/5 ratio. Various solvent blends can be used to dissolve the nitrocellulose, but the most versatile mix uses 100% fast solvent, and no more solvent than it takes to completely dissolve the N/C. It is entirely feasible to use the 75/20/5 blend (or whatever you decide is best), but you should take care to make a thick mix and add more of the solvent blend as you make new batches. To tailor a mix for different results, separate a small portion of the batch and keep careful records on what you add and what results are obtained. Poor spreading usually is

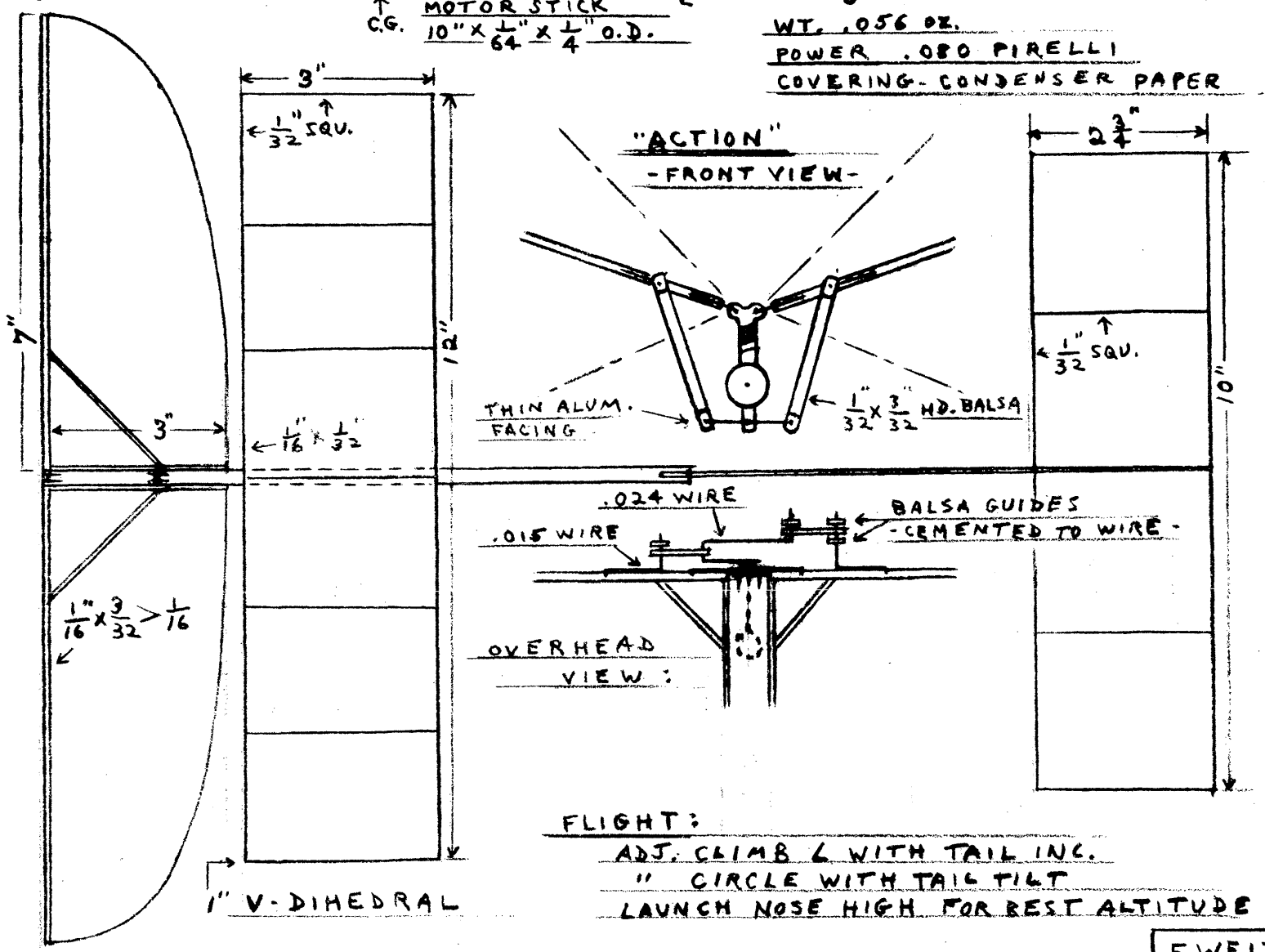
(cont. p. 4)

"BIRDNIK"

INDOOR ORNITHOPTER

MOTOR STICK
10" x 1/64" x 1/4" O.D.

WT. .056 OZ.
POWER .080 PIRELLI
COVERING - CONDENSER PAPER



FLIGHT:
ADJ. CLIMB & WITH TAIL INC.
" CIRCLE WITH TAIL TILT
LAUNCH NOSE HIGH FOR REST ALTITUDE

F. WEITZEL '65

cured by adding some fast solvent. Uneven color may be caused by improper balance of medium and slow solvents, but it may be caused by improper pouring techniques as discussed in Part IV. Too much medium and slow solvent may prevent proper drying on the water; when you pick it up the sheet may continue to shrink until it breaks. If shrink breakage is a problem, add more fast thinner and wait longer before picking the film off the water.

Some solvents can be classified as very slow, and can sometimes be used to help create more uniform color in the heavier films such as blue (used for props). Two such solvents are Butyl Cellusolve and 2-ethyl hexyl acetate; the evaporation speeds are 6 and 3 respectively. These very slow solvents should be used sparingly; you have to be mighty finicky about color before it is worthwhile to use very slow solvents.

I wish to thank Mr. James R. Leusch of Union Carbide Corporation for making the "Solvent Selector" brochure available to me; it has proved to be very helpful as a reference source.

NEWS FROM AROUND THE WORLD

AUSTRIA

Manfred Koller's late, late sessions (starting at midnight) have paid off again. With two new and lighter 35 cm. models, his new high time for the 45' railway station is 8:12. He also passes on the word that more indoor fliers are active in Vienna, where the Austrian Aeroclub has its headquarters. Perhaps we can get news from there also!

ILLINOIS - CHICAGO

Sad to relate, but the Illinois State Guard has stepped up training activity and the Madison Street Armory is no longer available for weekend flying. Pete Sotich is the man to contact for the latest word on whether a new site has been lined up, and for the Chicago indoor schedule for this winter.

INDIANA - KOKOMO

Beautiful outdoor flying weather cut the entry list short at the Kokomo Aero Team's October contest, but it was still an enjoyable session. Jim Pulley won Easy B with 8:49, Ron Ridgeway won HLG with 0:29 (1964 rules) and Jack Fike's Bristol Prier scored 132.5 point to take the scale event. The Nov. 21 contest will have these same events plus a Jetco ROG event for the youngsters. Bunker Hill AFB is the site, and these dates are usually "solid", but check with Chuck Borneman, 1401 West Taylor, Kokomo, Ind. 46901 for more details.

MASSACHUSETTS - M. I. T.

The first M. I. T. session was held October 30, on rather short notice, and the November session is set for Nov. 20 from 4:30 PM to 8:30 PM. The third session will be Dec. 11, same time. All sessions held in the 42' M. I. T. Armory and there is quite a bit of variety in the models which show up. Contact Jon Wexler, 362 Memorial Dr., Cambridge, Mass. 02139 for more details.

MICHIGAN - ANN ARBOR

The Ann Arbor Airfoilers indoor sessions have been set up for No . 5, Dec. 4, Jan. 8, Feb. 5 and March 5. This is an active group with emphasis on young ters, and their event schedule includes Novice HLG, Jetco ROG, Open HLG and Easy B. Indoor Scale will also be held at the December session, and maybe others. This group is open to postal meets with similar groups in Cat. I sites.

TEXAS - FT. WORTH-DALLAS

The indoor activity started with a bang, with the sessions set for the first Sunday each month. The first session was almost blown out by a blower which wasn't turned off, but Bob Putman still managed 7:59 with his FAI (he flew over in a corner). The November session had a North American "Skeeter" contest, which was almost bedlam. Fifteen youngsters (sub-teens) battled it out, with top Skeeter time (stock models except for using better rubber) was 0:40.7. The best Jetco ROG time was only 0:37.5! Serious flying got a late start, and top time was 5:11 with an Easy B and 0:28.4 in HLG.

THE MANHATTAN FORMULA

The ideas presented below come from Ed Whitten, and I believe this concept is one which deserves a trial. It is a cabin model which is really different, and could be a useful design for advanvce training of beginning model builders. At first glance, the concept of a BOX to define minimum cross section is appalling. However, if you have a 20" span scale model of the Piper Cub type, measure the general area around the cockpit and you will be surprised to find that it comes close to the BOX size as it is. And, unless you build ultra-light indoor scale, the Manhattan Formula model will be lighter and should fly better.

Ed set up the rules so they were fairly restrictive, so as to retain the character of the event. I don't agree with all of his stipulations, but let's try it just as is, and let the chips fall where they may:

1. Minimum weight .3 oz.
2. Rubber power only - no restriction on number of motors enclosed in fuselage or on use of gears.
3. Only one prop may be used - must be tractor prop.
4. Max. flat span 20", max. chord 4", monoplane only.
5. Max. stab span 8", max chord 3½".
6. Only one fuselage permitted, rubber motor(s) must be completely enclosed except for 1" sq. access hole. Fuselage must include a 2" x 3" x 5" BOX as minimum cross-section. BOX must be identified at all corners for easy checking; BOX to be oriented as shown on the sample three view.
7. Model must R.O.G. from a three point contact consisting of 2 wheels (min. 1" dia.) located forward of the C.G. and any point to the rear of the model.
8. All pertinent AMA flight rules shall apply.

POSTAL CONTESTS

Tom Vallee (42'site) vs. Charlie Sotich (75' site) FAI
Fudge factor = 1.34 ($\sqrt{75/42}$)

Tom Vallee 11:46 + 12:40 = 24:26 (x 1.34) = 30:42
Charlie Sotich 18:02 + 18:53 = 36:55

Get in on the fun! The San Diego Orbiteers are ready for postal meets in Cat. I, paper covered Easy B and HLG; the Ann Arbor Airfoilers will take Easy B and HLG postal challenges.

Clarence Mather	Dick Black
3880 Ecochee Ave.	1717 Covington
San Diego. Cal. 92117	Ann Arbor. Mich. 48103

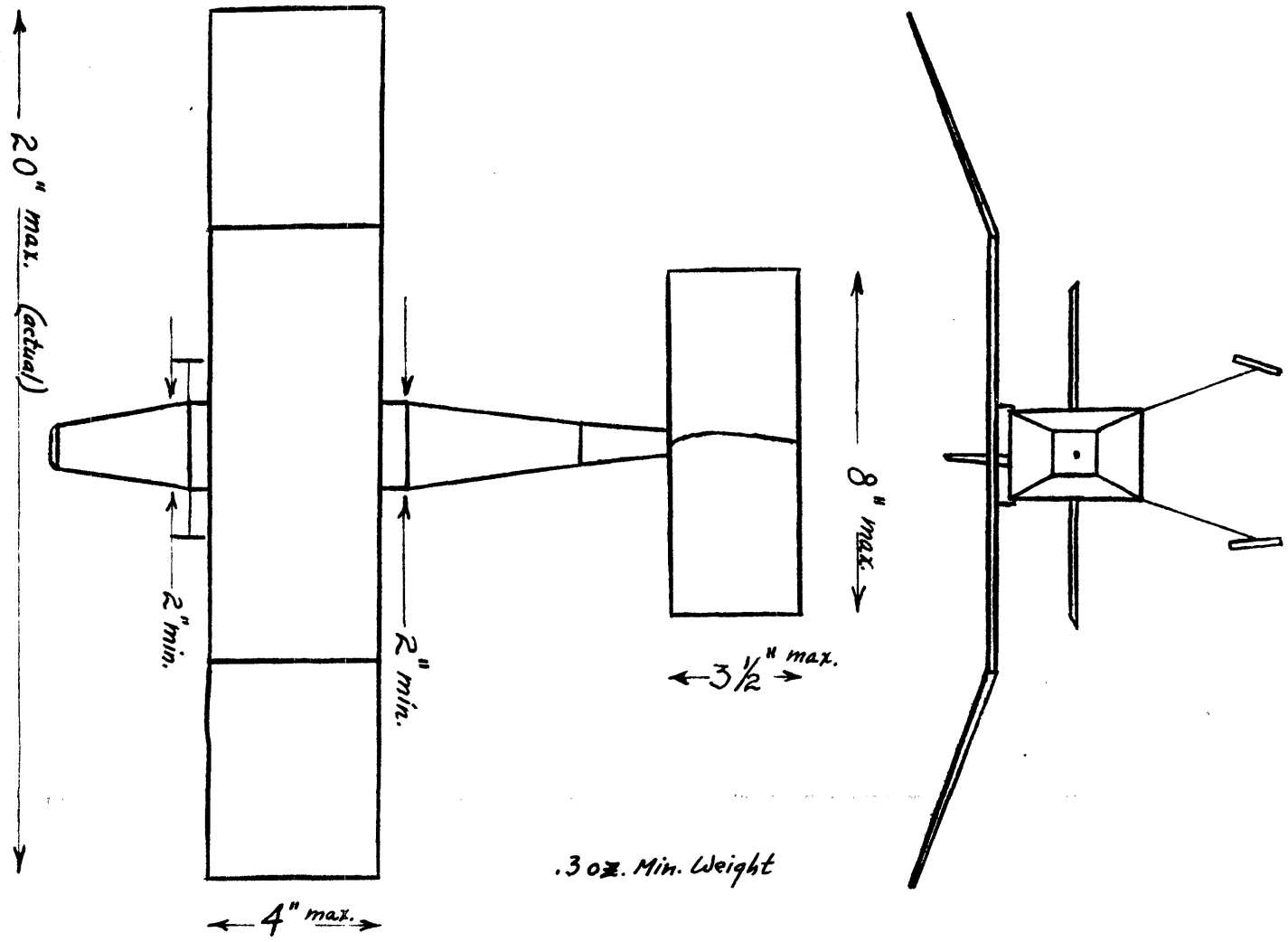
HINTS AND KINKS

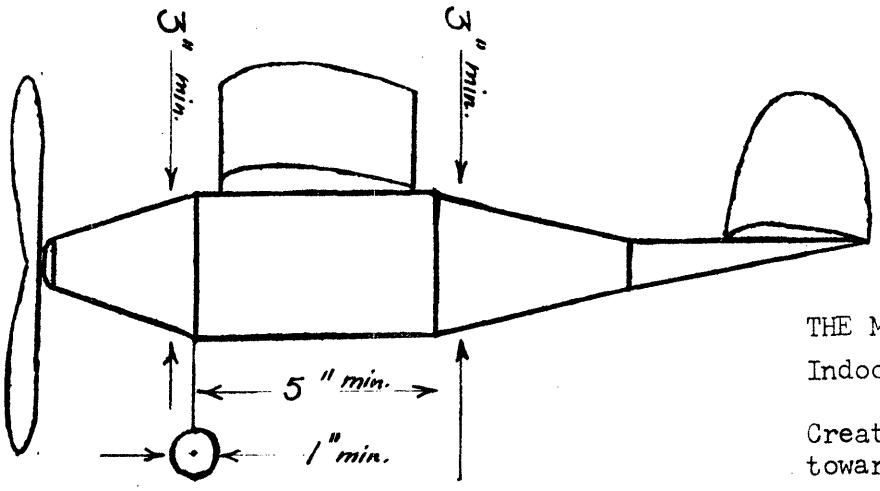
Field Repair

Bob Putman suggests that monofilament dacron can be used as an emergency repair for certain types of microfilm tears, primarily to prevent the hole from getting worse until it can be patched properly. Although this technique is most useful for holes or tears near a wing or stab tip, it should be helpful for most holes. Wet a single strand of dacron with saliva, place it across the surface at the edge of the hole and tack-glue both ends to the framework. Simple and light. but effective.

Pin It? Horrors!

One thing I have missed from the days of building outdoor models is the business of pinning the wood down, that is, sticking the pins through the wood. Now, thanks to Clarence Mather, I find there are pins available that are small enough to pin indoor wood sizes directly. They are insect mounting pins, size 000, type C210, available from Ward's Natural Science Establishment, P. O. Box 1712, Rochester, New York 14603 for 80¢ per 100 or $2.50 per 500. Add 20% for postage and handling; they have a $2 minimum order. Actually, these pins can be used to pin wood splices even in very small wood, pin outlines to a template, substitute for bracing pegs during field repair and act as a stopper for your hypodermic glue gun.





THE MANHATTAN FORMULA

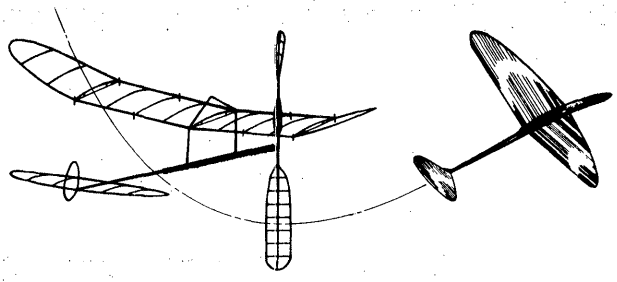
Indoor Cabin Model Airplane

Created to direct indoor design towards new chanels.

Designed and drawn by
Edmund S. Whitten, Jr.
March 1965, New York City

The Voice of N.I.M.A.S. DEC·1965

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

WAYNE CHIAPPERINI, 18 Soneco Dr., Groton, Conn. 06340
BOB GREIDER, 8545 West 1st Place, Lakewood, Colo. 80226
LOUIS VARGO, P. O. Box 68, Escondido, Cal. 92026
CHARLES WIECHARD, 36 Iriquois Rd., Levittown, Pa. 19057

A Friend Passes

Free flighters in Southern California will miss Haruto Shimazu, who suffered a fatal heart attack in November. He was highly regarded by all who knew him; Clarence Mather said "We have lost a friend, an excellent modeler, and a real fine person."

NIMAS Awards

Last Spring the much discussed NIMAS Awards were finally adopted, and the FAI team selection program gave extra opportunity for fliers to win the awards. A total of twenty-three awards were announced over a five month period; three of these awards went to Bud Romak as he became the first NIMAS Ace (winner of all three awards in a single ceiling category). At long last the Awards are being sent out, so if you have one or more awards coming you should soon get them. Two more awards have been made since the last listing: Ernie Kopecky's efforts during the FAI program got him Cat. III Silver (34:10) and Cat. III Gold (35:13). If you made flights during the Nats or the FAI program which qualify you for NIMAS Awards, you may obtain an application form and will not need the CD's signature since the results of these meets have been published. Anyone interested in obtaining the application forms may send for them to Box 545, Richardson, Texas.

NIMAS Certificates

Quite often, indoor meets are held which charge small entry fees; even with regular entry fees the total entry is small enough to make it a financial hardship on the sponsor to offer trophies or other substantial prizes at such a meet. Therefore, the NIMAS Certificate has been designed and made available to NIMAS members to give at club meets. The certificates can be given to anyone, not just NIMAS members. The certificates have the NIMAS letterhead at the top; the nicely printed test reads "This is to certify that _____ has demonstrated skill and proficiency in flying indoor model airplanes with the flight time of _____." There is a signature line for the NIMAS member and a date line; future printings will have a space for event name and place won. For first, second and third places you might add a small notarial seal with blue, red or white ribbon to help set these awards apart. These awards are available to NIMAS members for 5¢ each; a minimum order will be $1 to handle cost of packing so they can be sent unfolded. If you want a sample certificate, send a stamped envelope and one will be sent to you free.

New Materials

Six months ago George Aldrich gave me a sample of non-tautening butyrate dope with the idea that it might be advantageous as an additive to microfilm. The idea of a non-tautening dope (produced that way by the manufacturer) was unheard of; at least I had never heard of it! So, after considerable investigation I concluded that it was a microfilm additive of high potential (see Microfilm Techniques, this issue) and I have figured out other uses for it also. This material, along with non-tautening nitrate dope, is manufactured by Randolph Products Co., P. O. Box 67, Carlstadt, New Jersey. I was able to buy both the butyrate and nitrate in a tinted form from the local Randolph distributor, but I am advised that the untinted products are available only from the factory as special order. The price would be $5 per pint on small single orders, but part of this is handling charge.

FAI INDOOR REPORT

Report On CIAM Meeting

Rudi Beck of Hungary will try to organize the 1966 World Indoor Championships in Debreen, Hungary for July 28 through July 31, 1966. If he is successful, the meet schedule will be set up to allow practice flying on July 28 and then there will be a two-flight round on each day following. The site is about 90' ceiling with floor area about 65' x 130'. The top time in the site has been 26 minutes, and winning time at a recent contest was 22 minutes by Karl Hinge.

Elsewhere at the meeting, a very important and much needed development took place. FAI Indoor Free Flight has been divided into four ceiling categories as follows: Cat. I - up to 8 meters, Cat. II - 8 to 15 meters, Cat. III - 15 to 0 meters and Cat. IV - over 30 meters. In case you didn't know, 1 meter = 3.28'; if you haven't already figured it out, your site may be an "ugly duckling" under AMA rules (like all those 38' to 48' sites we have kicking around) and a real gem under the FAI ceiling rating. The upper limits of Cat. I, II and III are 26.2', 49' and 98' - let's have some FAI record trials!

POSTAL CONTESTS

A year and one-half ago the idea of indoor postal meets was aired in this newsletter; by February '65 the concept had caught on strongly enough that this column was established to report the results of various postal meets. The game has become international in scope, with meets taking place between the Maxecutors of Washington, D. C. and the Wellington club of New Zealand. Because of special conditions in indoor work, and the relatively diverse types of models that show up at indoor sessions, indoor postal meets differ from outdoor meets in several matters of practice. First, no firm requirements are set on how many team members from each group fly, and the top scores of each group have the most meaning. Second, the difference in ceiling heights is customarily allowed for by "fudge factors" which were established by guess and have worked very satisfactorily. In HLG, a simple ratio of ceiling heights is used as a multiplier: if a 20' site goes against a 25' site, the multiplier is 5/4 or 1.25. That is, a 20 sec. flight in the 20' site is equal to a 25 sec. flight in the 25' site. In practice, this will work very equitably as long as the ratio of ceiling heights is 1.5 or less. For rubber, Charlie Sotich came up with the fact that the top performances in all three ceiling heights varied almost exactly as the square root of the ratio of ceiling heights; for the ceilings above, the fudge factor is 1.12 and a 10 min. flight in the 20' site is equivalent to 11:12 in the 25' site. In practice this seems to hold true over the entire range of sites, but little has been done in flying Cat. I against Cat. III as a check on the validity of this fudge factor over extreme differences in ceiling heights. Two recent meets were:

Bud Tenny (26') vs. Ned Smith (20'); Cat. I HLG
Fudge Factor = 1.3

Bud - 0:54.4 Ned - 0:42.7 x 1.3 = 0:55.5

Bud Tenny (26') vs. San Diego Orbiteers (22')
Cat. I HLG (Fudge = 1.18) Easy B (Fudge = 1.08)

Bud - 0:54.4 (HLG)	Nat Antonioli 0:41.0 x 1.18 = 0:48.4
Bud - 5:11 (Easy B)	Haruto Shimazu 5:44 x 1.08 = 6:13
	C. Mather 5:37 x 1.08 = 6:07
	Fudo Takagi 5:07 x 1.08 = 5:36

MICROFILM TECHNIQUES

Part III - Plasticizers And Modifiers

The techniques outlined in parts I and II would make it possible to pour a sheet of nitrocellulose film and probably pick it up. This sheet of film would be brittle and would shrink for some time - not exactly what we need for indoor models! To improve the handling and ageing of the film, one or more materials will be added to the mix. These materials are chosen for the characteristics which they will impart to the final material, and sometimes two or more plasticizers will be combined to achieve the best results. No more plasticizer than is necessary should be used, however, since all these materials decrease the strength of the film to some extent.

Plasticizers are either solvents for nitrocellulose or non-solvents; the non-solvent types usually act as a mechanical lubricant and are most likely to migrate to the surface of the film. When this happens, the film is no longer properly flexible and is also subject to damage from ultraviolet light. Besides, this stuff on the film collects dust, dirt and other models that happen to touch yours! Typical non-solvent plasticizers are castor oil, soybean oil, linseed oil and eucalyptus oil.

The solvent type plasticizers commonly used in microfilm are dibutyl phthalate, dioctyl phthalate and tricresyl phosphate. This class of plasticizer is more efficient in nitrocellulose and thus less is needed to achieve the desired results; since they are essentially a solvent with a low evaporation rate, they tend to create a stable film that ages well.

Monsanto Chemical Co. is one of the largest manufacturers of plasticizers, and some of their literature has contributed greatly to this part of the series. One of their charts lists characteristics of film and sheeting and suggests plasticizers to enhance those properties as follows: (applies to nitrocellulose only)

TENSILE STRENGTH	Dicyclohexyl phthalate (DCHP), Diphenyl phthalate (DPP) and Tricresyl phosphate (TCP)
HARDNESS	TCP, DCHP AND DPP
ABRASION RESISTANCE	DPP and DCHP
FLAME RESISTANCE	TCP
TEAR STRENGTH	Dibutyl Phthalate (DIP)
HEAT STABILITY	Dioctyl Phthalate (DOP) and DIP
WATER RESISTANCE	DOP and TCP
LIGHT STABILITY	DOP and DIP

On the spec sheet for DCHP, the rather interesting observation is made that nitrocellulose films plasticized with DCHP "feel dry and separate easily"- an obvious good characteristic for microfilm. From the chart above, DCHP is said to promote tensile strength, hardness and abrasion resistance. Aha! The Perfect Plasticizer! So, try it!

The "ideal microfilm" should, no matter what other things it will do, be strong and separate easily if it folds over when you break something or when two models get together. The most obvious thing which causes microfilm to cling together is a "tacky" or "sticky" surface; but very thin, perfectly dry films will also cling or stick together because of what appears to be static electricity on the surface. A third property of microfilm sometimes causes trouble - film that is very smooth will overlap and stick simply because it is so smooth. This is like the Johansson blocks used as measurement standards in machine shops - they are so smooth and flat that two mating surfaces will exclude the air between them and a sort of vacuum holds them together. Film that is very smooth and highly reflective usually has this problem.

So, I tried DCHP. Blue film was noticably less sticky than films using other plasticizers, but gold film from the same batch was unusually troubled by static. An attempt to get the best of two worlds was made by using DCHP and TCP together; the resulting film seemed to be more static free and less sticky, but further tests need to be made here.

Some people build models with stressed-film construction and this calls for special film for best results. It must be stable, before and after heat shrinking, and it must be easily heat-shrunk to produce the stressed skin which adds to the overall strength of the model. To date, the best plasticizer for this type of film is benzyl butyl phthalate (BBP). The only apparent fault of BBP is that film using it as plasticizer is tacky like other phthalate-plasticized film; the static effect seems to be relatively minor. Perhaps BBP and DCHP can be used together to good effect??

Non-tautening butyrate dope (see "New Materials" on page 1) is a material which seems to hold unusual promise as an additive for microfilm. To date, film using NTB shows unusual freedom from stickiness as a blue film and very good resistance to static effects as a silver or gold film. Various samples have shown it to be possible to produce either stable film or film which will slack off after a time, depending upon the amount of NTB used. I have not had time to try heat-shrinking this type of film, except to verify that it can be heat-shrunk. My reservations concerning this material are based upon the poor record of butyrates with regard to delayed action shrinking, and upon the fact that NTB can be thinned with the proper blend of solvents and poured into a sheet of film. The resulting film is weak, spongy and sticky - not terribly reassuring!

Another approach to preventing film from sticking together was pioneered by Curtis Janke - the "roughener" concept. The idea is to use a material which comes out of solution before the rest of the mix hardens on the water; this produces minute irregularities on the surface which prevent the surfaces from getting into good contact and thus helps prevent sticking together. It may be that NTB works this way, except that NTB is soluble in all the solvents used in the microfilm. Cellulose Acetate, in a very dilute acetone solution, is added in very small quantities to the microfilm solution. Curtis warns that this makes the solution cloudy, and it should be added to small quantities of film solution at one time to avoid the possibility of ruining the whole bottle of solution. I have verified that dilute C/A added to film using BBP did indeed reduce the tendency to stick; but I also added extra acetone to the mix and this may have caused the uneven color I observed in the film.

The problem of choosing the proper plasticizer, and of finding out how much to use, is the most time consuming part of brewing your own film. The proper solvent blend can be determined in a matter of hours, if you use a systematic approach. The bare minimum of time needed to establish the proper amount of plasticizer is three weeks for a known plasticizer; an unknown plasticizer may develop undesirable symptoms months later. As an example, Dick Kowalski formulates his film (for stressed film) so it has the maximum plasticizer that does not go slack on the model. The test is to see that the film does not go slack on the pouring hoop after two or three weeks. My own tests for plasticizer amounts and effectiveness are simple and easy to implement. To check for film stability, 3" diameter hoops (like rudders) are built from .024" sq. balsa and covered with various colors of film. The amount of warp (if any) after three weeks gives some idea of the amount of shrink. A quick check of the heat-shrink ability is made by shrinking gold film on such a frame; the sample is left to age again to see if the film will continue to shrink, remain stable or slack off. A better test would be to subject the samples to 140° F. and 90% humidity to test for "worst case" storage of the finished model.

Tests for sticky film are hard to devise; I finally settled on tearing loose a corner of the film and letting it fold over on itself. If it can then be separated with tweezers, it is repeatedly folded over and separated. A very dry film will take four or five folding cycles before failing. Film which has a high degree of static will quickly fold over after you cut it loose; it will probably separate partially and leave several tiny folds that won't pull out. A better test for film would be to make a small wing (a 3" x 6" ellipse for example), cover it, and then fold it up so the film laps over. If it can be straightened out again, the film is good.

NEWS FROM AROUND THE WORLD

CALIFORNIA - WILMINGTON

The Wilmington Recreation Center, site of the first regular Cat. I contests, has been largely dominated by a very active indoor scale group from the North American Flightmasters for quite a while. Larry Renger, a member of the WIMAC club, is applying for a Record Trials Sanction for the Feb. 11, 1966 session at Wilhall. Rally around, WIMAC! Cat. I indoor has been almost dead at its birthplace - help revive it!

INDIANA - KOKOMO

Jim Richmond visited the Kokomo Aero Team's November

contest and "bombed" them in Easy B - his winning flight was 12:18.5. That was a paper covered Easy B in a 45' site; truly fabulous time! His son Randy won Jr. HLG with 0:29.0 (best single flight); Bob Larsh won Open HLG with 0:38.2 and Jack Fike's Bristol Prier scored 139.3 points to win Scale. The next meet is on Dec. 19, at Bunker Hill AFB; the events are Easy B, HLG, Scale, Jasco ROG (for sub-teens) and rubber powered straight line speed. Check with Chuck Borneman, 1401 West Taylor, Kokmo, Indiana, 46901.

MASSACHUSETTS - M. I. T.

M. I. T. sessions coming up are scheduled for Dec. 11 and Jan. 15. These are on Saturday, 4:30 to 8:30 PM at the 42' M. I. T. Armory. Contact Jon Wexler, 362 Memorial Dr., Cambridge, Mass. 02139.

MICHIGAN - DETROIT

The Detroit Balsa Bugs set up a busy indoor schedule at the Lasky Recreation Center at 13200 Fencon in Detroit. Their November session had a Jetco ROG event and a special HLG event. A large number of Juniors turned out to fly - the Dads were so busy helping the kids that they didn't get to fly much! The December 10 session will be a HLG meet and the January 14 session will be a paper stick contest.

NEW YORK - SYOSSET

The Grumman Engineering Model Society has indoor sessions on the first and third Thursday of each month at the Harry B. Thompson Jr. High School in Syosset. The gym has 19' clearance to the trussed girders and is used from 7:30 PM to 11 PM. This is an active group and they will welcome visitors. For more information call Mr. Jean Paillet, 516-MA 6-2825 (home) or 516-LR 5-2388 (business). The next sessions are Dec. 16, Jan. 6 and Jan. 20.

OHIO - CLEVELAND

Indoor is coming up fast and furious in Cleveland, with a Cat. I Record Trials and scale contest at the St. Edwards High School Gym (Lakewood, Ohio) on Dec. 12; and the Great Lakes meet is set for Jan. 2, 1966. The St. Edwards Gym is 33' high; 14 existing AMA records have been set here. Public Hall, in Cleveland, is the site of the 14th Annual Great Lakes Indoor Air Meet. This meet has always been the largest indoor contest in the world, with 20 classes for six age groups - over 5000 official flights in a single day.

PENNSYLVANIA - LEVITTOWN

The Flying Bucks club has indoor sessions weekly in an 18' auditorium. Their major activity has been in B Stick and A ROG, with B times around 7 minutes. Check with Charles Wiechard, 36 Iriquois Rd., Levittown, Pa. 19057 for details.

PENNSYLVANIA - PITTSBURGH

Ron Ganser and his hard working crew are stirring the indoor pot again. They had an extensive indoor and outdoor model display at a hobby show recently; kids who viewed the show were encouraged to build a simple model at the show. The kids got to keep the model and got a chance at a gift certificate from a local hobby shop. Flying sessions are held weekly at the West Penn Recreation Center and monthly at the Soldiers and Sailors Memorial Hall. Contact Ron Ganser, 2500 Mission St., Pittsburgh, Pa., 15203 for details.

TEXAS - FT.WORTH-DALLAS

A planned series of Drill Hall sessions was derailed when the Navy needed the Drill Hall until after January; part of the special Junior program was salvaged by holding Novice Jr. HLG at the Dec. 5 Arlington Recreation Center session. A last minute change in plans got the Dec. 5 session sanctioned; Open contestants didn't do anything spectacular, but the few Juniors stole the show. In their first HLG meet, Tom Gist won with 0:31.0, Reggie Peters placed second with 0:29.5 and Kristi Tenny scored 0:20.5 for third.

WASHINGTON D. C.

The Maxecutors continue their monthly sessions in a 38' hangar at Washington National Airport - contact Tom Vallee, 9136 Edmonston Rd. #304, Greenbelt, Md. 20770 for details. This is an active and competent group, spoiling for postal meets, and very competitive among themselves also. A special feature of the December session is a "grudge match" in B Cabin between Tom Vallee and Frank Ehling; the stakes are a Chinese dinner paid for by the loser!

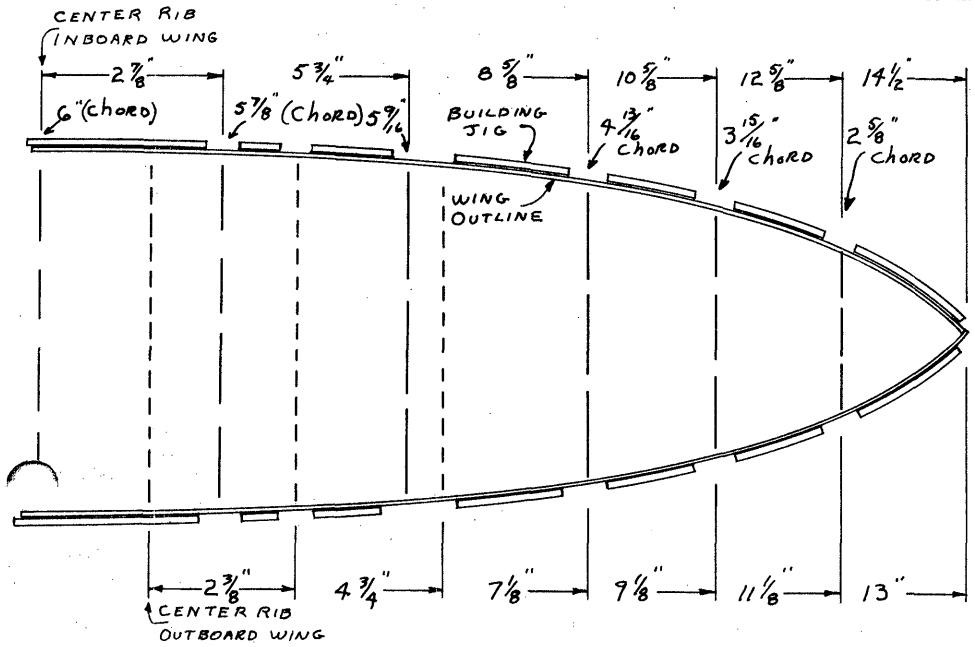
SIMPLIFIED STRUCTURE

Those who are faced with the problem of helping kids build models soon find that the jump from Jecto ROG to conventional indoor models is a pretty stiff one for the younger kids. The idea below was conceived about the same time by Max Chernoff and myself; I have designed templates for a 120 sq. in. model and Kevin and Kristi (my oldest kids) are now flying models using props of this type of built-up construction. This approach makes a model that 7 to 10 year old kids can build, and the performance is excellent for this age group. This type of construction yields surfaces less prone to warp than square tip outlines, the tip itself is less fragile than conventional ones, and the outlines are made with fewer pieces than conventional models.

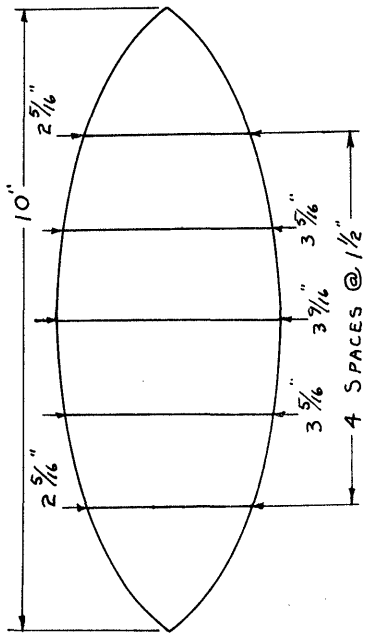
The sketches below show a stab layout, and a sketch of a typical wing jig. The wing jig was constructed by forming two 1/16" sq. balsa strips to the outline shown; the outline had been drawn on flat cardboard, and the strips were pinned in place and fastened down with two coats of Hobbypoxy clear dope over the strips and the rest of the outline. Then, the outline strips were cut at each rib station as shown. The wing is built right on top of the Hobbypoxy, and the glue barely sticks at all. The slots at the rib stations give a place to run a blade under the outline to pop the glue loose after the wing is dry.

Props are handled in the same manner - the spar runs clear out to the tip, and the outline consists of a leading edge piece and a trailing edge piece, each soaked in water and laid onto the template built right on the block so that no intermediate forming step is needed.

RIB SPACING - INBOARD WING



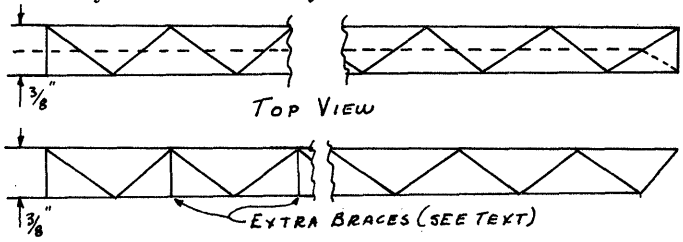
RIB SPACING - OUTBOARD WING



DESIGN FOOTNOTES

Built-up Booms - The Last Word

After several months of experience with built-up tail booms, I consider the design below to be sufficiently perfected to be equal in strength to competitive weight rolled booms. Commentary of observers at the Nats ranged from "I like it - it's lighter than a rolled boom", to "Too much work!" and "Too much drag!" It is lighter than rolled booms and much stiffer (Detroit designs depend on boom flexibility, so this is a disadvantage for certain designs), and much more easily repaired. Three times during the Nats and the FAI Finals I had a boom twisted by gusts and stupid handling; in each case two or three cross pieces were replaced and the models flying ten minutes later with no change in trim. I have never before been able to repair tail booms at the field without a lot of re-trimming - a real advantage for the built-up boom. I have no answer for the drag comment until a good method of indoor drag measurement comes along; and it takes me less time and less effort to build one of these than it does to build a good rolled boom. When I get through building the boom, it is easier to mount the stab and fin and they are more solidly mounted.



The major change in this design over the earlier ones is to use a minimum of taper and to use shorter cross pieces to improve the torsional rigidity. The extra-deep cross section at the rear makes it possible to brace the stab with two dacron strands criss-crossing below the boom. The dacron resists twisting loads and up-loads; snug film and the framework resist down-loads to make a very light and stable surface. As a result, the latest FAI boom (15½" long) weighed .0031 oz.; the entire tail assembly weighed .005 oz. for a 25% stab and 8% fin.

Construction notes: Build a crutch (top view) right on a full-size line drawing. Cut all the cross pieces to the same length ahead of time; glue them in place on top of the longerons and trim off the ends with a sharp blade after the glue has dried (see Fig. I). Spot glue the crutch to a 3/16" sq. stick with the cross pieces on the top side - this places them inside the finished boom to leave a flat surface for the stab to glue onto. The stick serves as building jig and handle, which saves time and insures a straight boom.

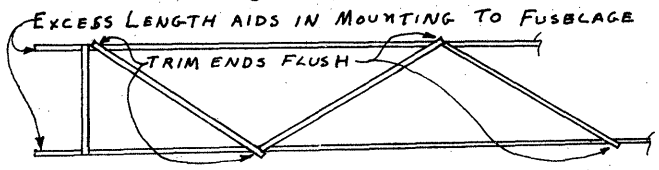


FIG. I

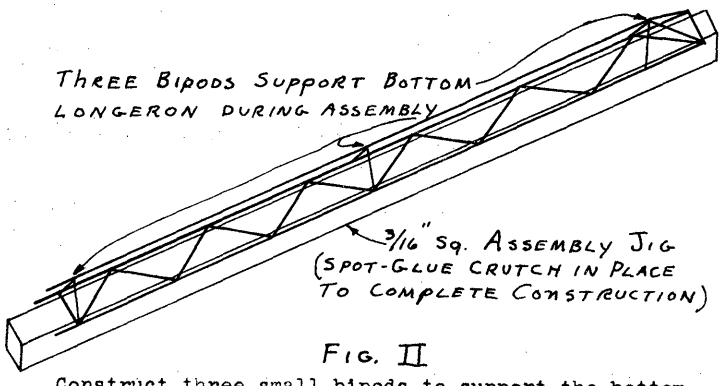


FIG. II

Construct three small bipods to support the bottom longeron during assembly; glue them in place as shown in Fig. II. When the bottom longeron is in place and dry, put the cross pieces on three or four to a side and then do the same on the other side. Note that two vertical pieces should be used to brace the bottom longeron on each side (refer to the side view and locate these between the second and third diagonal and the fourth and fifth diagonals). These are necessary because these two spots catch the concentrated force of boom down-loads and the bottom longeron buckles there.

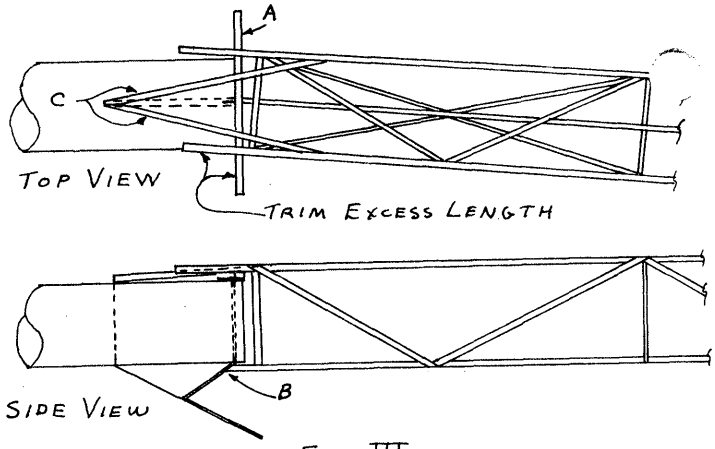


FIG. III

Figure III shows how to mount the boom. A jig is necessary for assembly, to support the fuselage and boom in correct alignment while the glue is drying. Start by glueing a 1/32" sq. strip on top the motor tube at the rear end. Trim the bottom longeron to fit properly to the rear hook web or the bottom of the fuselage and glue it in place. Leave the excess length of the top longerons loose, but resting on the 1/32" sq. strip (part A). Check to see that the boom alignment is correct (after the glue at "B" dries) and glue the top longerons to part "A". Cut two more pieces of 1/32" sq. (part C) to fit and glue them in before disturbing the jig. Remove the assembly and trim the excess longeron length and its all done. It usually is a good idea to hold the fuselage in one hand and the rear of the boom in the other, twist the boom gently to see that all diagonals are glued in place. Once in a while you will miss a joint or a diagonal will be weak - re-glue or replace and you will be surprised at how strong the boom is. You can even support the motor stick from the rear of the boom - try that with a rolled boom!

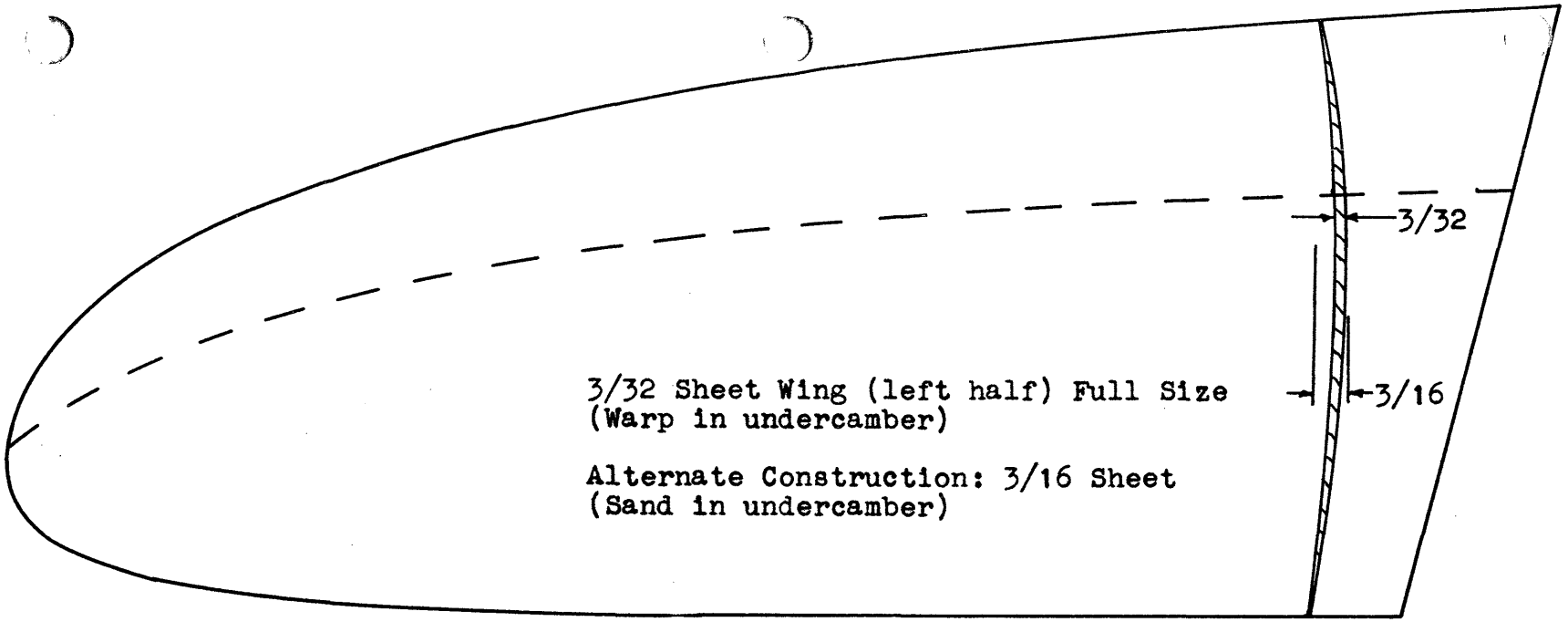
One final suggestion. Most people who would otherwise build a built-up boom balk at the tiny pieces. The problem is easily overcome thus: Cut the pieces all at once, moisten the end of a balsa scrap, pick up one piece with the moist end, put glue drops in the proper place on the longeron, and put the piece in place. After a little practice, two longerons can be glued down per minute on the crutch, but the cross pieces which glue on the side take longer because you must exercise care to avoid distorting the bottom longeron.

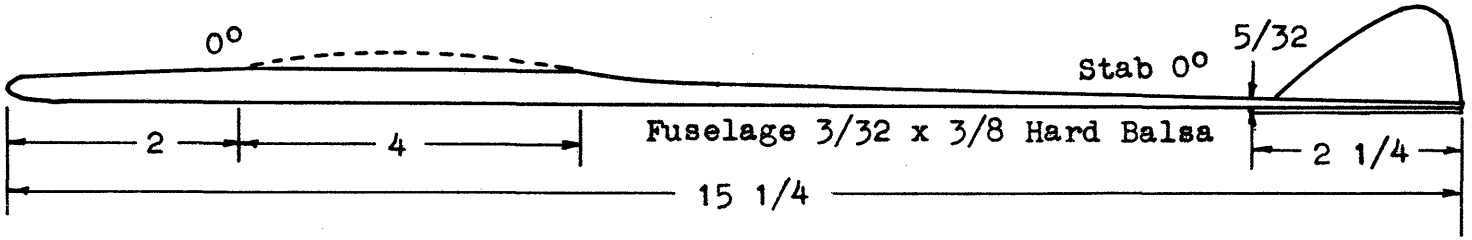
A LOOK AT YESTERYEAR

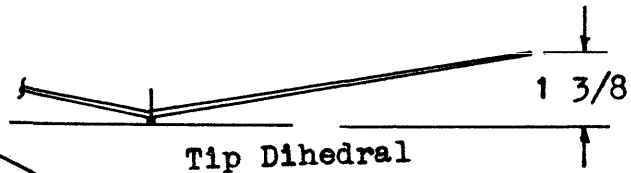
Dick Ganslen loaned us a copy of the 1938 JASCO Catalog; it is a fascinating excursion into the past of our hobby. Balsa sheets (for indoor), the same as we are used to buying, cost between 3½¢ and 5¢; machine-cut indoor props (needed final carving and sanding) sold for 11¢ for a 12" dia. prop and 34¢ for an 18" dia. prop; "B" grain 1/32" sq. strips for ½¢ apiece; seven sizes of tungsten wire ranged from 40¢/25' to 80¢/25'; the famous JASCO microfilm sold for $1 per pint and Brown contest rubber (six sizes from 1/32" to 7/64") sold for a maximum of 12' for 5¢. Another very interesting thing - superfine tissue is the lightest covering material listed in this catalog, which brings up an interesting historical point. When was condenser paper first used, and when was our present Paper Stick event created?

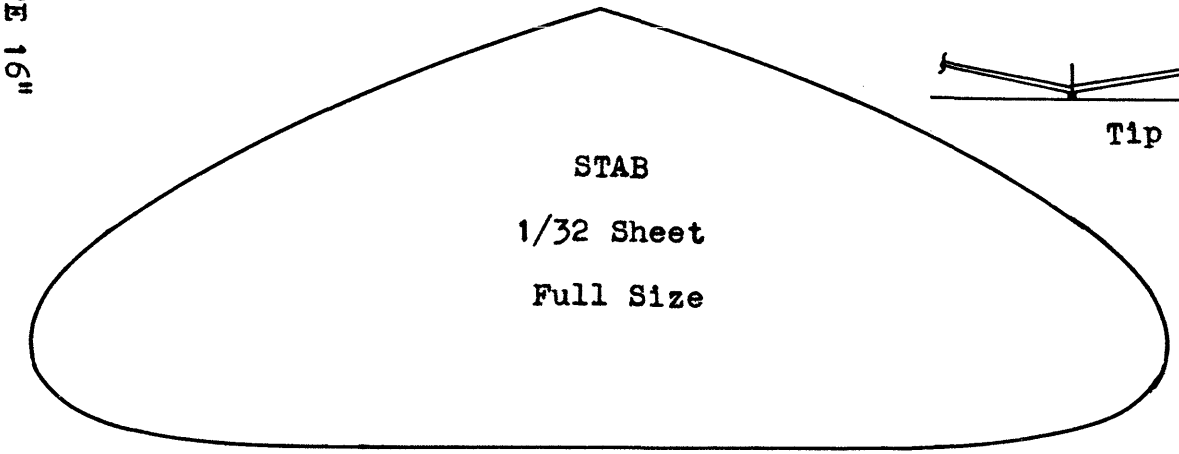
STATE OF THE ART

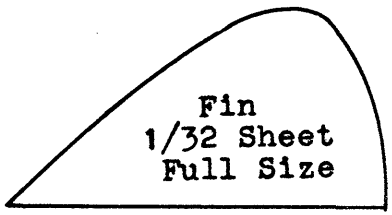
The model of the month has never set a national record and probably never will; nonetheless it represents state-of-the-art development in a special area. Many sites, both in the U. S. and around the world, are about 45' high. This is well above Cat. I and uncomfortably low for direct competition against Cat. II record marks. In a very real sense, gliders developed in 45' sites are in a class by themselves, since this ceiling height is still low enough that rate of sink doesn't have to be traded off for altitude. The site this model was developed for is a maximum of 45' high, with obstructions at 30', and the maximum width is only 70'. Truly, 44 seconds is excellent time in this site, since the ceiling curves sharply enough that not all of the altitude can be used. If you have a 45' site, this may be a good glider for you to try.







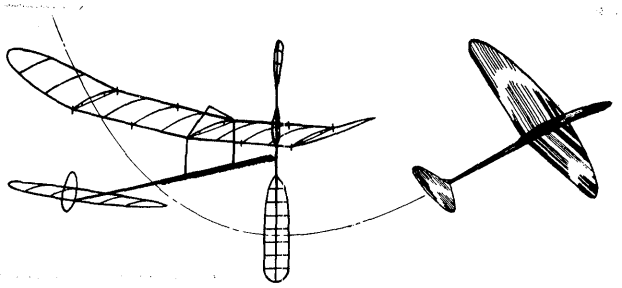




"STOMPETTE 16"
Designed by Meredith Chamberlain
Bloomington, Ind.
Best Time: 0:44.0 Bunker Hill A.F.B.

The Voice of N.I.M.A.S. JAN·1966

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

ED HICKS, 10633 Lavinia Rd., Affton, Mo. 63123
HARRY KESHISKIAN, 7 Sagamore Rd., Arlington, Mass. 02174
ROBERT MILLER, 408 E. Mumford Dr., Urbana, Ill. 61801
JIM MILLS, 6051 Hemingway Rd., Dayton 24, Ohio

Did You Join A.M.A.?

Have you renewed your AMA license yet? If not, you should do it right away. AMA is making an all-out push to get model building in the news in the best possible light; to help dispel the "toy airplane" image which hurts us whenever we seek a place to fly or seek any publicity or support for our activity. Other programs and possibilities are awaiting funds so we can gain other benefits - for anything that benefits any part of model aviation will also benefit us too. Therefore, we must support AMA by renewing; even by recruiting new members and helping them get started so they will stay members.

Besides, without renewing you will not get MODEL AVIATION; without M. A. you will not receive information about rules changes (except Indoor; INAV hopes to keep up with indoor proposals) and other things which will affect your model activity. Most important, you will not be able to read several very good articles about the National Free Flight Society. I will try to keep up with NFFS as it develops and publish the developments, for I believe that NFFS is a must. Many NIMAS members believe that Indoor would be gone if it were not for NIMAS; at least it would be at a lower ebb. NFFS can do much more for Free Flight than NIMAS has done for Indoor, because the movement is starting before the situation is as bad as it was for Indoor. (If NIMAS had started in 1955, we would have gained the foothold we need to really "move out" and no telling how far we would have gone by now.) NFFS is important to all of us - keep abreast of it as it develops and support it. We have much to gain!

Spread The Word!

Frank Zaic had the idea of getting model aviation material into your public library; I checked and found that the Richardson Public Library was willing and even anxious to get whatever material they could. Many such libraries are operating on fairly slim budgets and any books you can donate will help. For a start, get a copy of various Zaic Year Books, Gitlow's Indoor Model Building and Flying and anything else you think would be good. For that matter, the library might be a good place to put notices to interest youngsters in models - if they will let you do it. After all, there used to be books about model airplanes years ago; but many of them are badly out of date and not very many are printed anymore.

However, we are getting help from an unexpected quarter; Kevin brought home a school library book which had a story about indoor models. Some of the material was out of date, but the story was interesting and painted a very appealing picture of indoor flying. The book was "Problem Father" (originally "First Flight") and was published by Scholastic Book Services, a division of Scholastic Magazines, Inc. of New York. Perhaps we need to encourage more of this - maybe more youngsters would "get the bug" and seek us out instead of us having to seek them!

More On Dacron

For those who haven't tried monofilament dacron for bracing indoor models (and for those who have used up their supply), there is plenty left. Just send a stamped envelope and ask for it.

Back Issues?

There are a few copies of INAV which date back to 1963, plus complete sets of 1964 and 1965. These are available to NIMAS members @ 50¢/set postage and handling charge. Complete your own file; donate a set to your club library or the public library nearest you.

NIMAS Awards

Silver Cat. I HLG Award - 0:26.2, Eric Vogel

Silver Cat. I Rubber Award - 11:34.8, Bob Putman

Talking Letters?

We now have a tape recorder, so if you wish to correspond via tape we will welcome the chance!

New Materials!

This time it is a new source for thin aluminum: the plates used for multilith permanent plates are made from .005" aluminum which has a smooth finish and is very good for small fittings and various templates. Multilith is a printing process similar to that used to print INAV, so visit your local printing shop and get a couple.

FAI INDOOR REPORT

The 1966 World Championships

The latest word on the World Champs is that Hungary still has the ball. No word has been received on their plans, but if Hungary is unable to host the event, Great Britain is prepared to act as back-up host. So, it seems quite likely that the event will be held unless too few countries enter (five countries must enter to make it an official event). Each country should be already exploring the possibility of sending a team, either in person or a proxy-flown entry. The chips are down; we must have five countries entered by the deadline (I'm trying to find out what the deadline is) or we will lose the World Champs at the start of the coming growth of international indoor flying. This boom, of course, is starting because of the recent adoption of ceiling height categories by the CIAM. These categories: Cat. I - 0 to 8 m, Cat. II - 8 to 15 m, Cat III - 15 to 30 m and Cat. IV - over 30 m., make it possible for indoor fliers all over the world to set FAI Indoor records in their regular sites. I predict that competition will be most heavy in Cat. I and Cat. II, since these categories include about 90% of all the sites in the world.

Set World Records!

Frank Ehling, Technical Director of AMA, makes the following information available for those of us who want to try for FAI records in the new ceiling categories:

An AMA CD who holds a current (1966) license applies for a FAI Record Trials Sanction ($10 fee) in the same manner as he would for an AMA RT. There is no need to clear this through his District Coordinator since the sanction is good for one year or until a record is set, whichever comes first.

AMA Hq. has to have a brief report within 24 hours by telephone or wire, telling the performance of the aircraft and then a complete report within 7 days. AMA will inform FAI Hq. (through NAA) and FAI will issue a memo to all the other National Aero Clubs telling of the tentative record performance. The flier must then prepare three dossiers as outlined in the FAI Rule Book and have the CD certify these so they can be forwarded to AMA Hq. to be transmitted to FAI through NAA.

The CD really needs both an FAI Rule Book to get the specifications on the dossiers and an AMA Rule Book to get the official ceiling heights and measuring method.

It should be noted that these new records can be set with any size of model which is 90 cm. or smaller - if you have a 35 cm. model that flies exceptionally well in your particular site, there is no rule against using it. In fact, many of the Cat. I records will probably be set with models smaller than 90 cm., simply because these are easier to fly in limited area sites.

STATE OF THE ART

The model of the month is Ernie Kopecky's B Paper Stick model; it won the '65 Nats and twice almost set a new Cat. III record. Of the model Ernie says:

It was designed to get a head start on a 65 cm. FAI and actually is a multi-purpose model (65 cm. FAI/Paper Stick/B Stick). The latest design trends favored rear CG; how far back can the CG be if the model still has practical dimensions? After much pencil sharpening and using the Tail Volume Formula, a 105% CG model was designed. Although the 65 cm. FAI model was rejected, (Ed note - 1964 CIAM meeting) I felt that in time a 65 cm. model would be needed. Since the Nats were at Lakehurst this year (1965), I decided to test the design in Paper Stick. Two sets of parts were built and the heavier set produced a model weighing .052. oz., with .017 oz. being paper weight.

Flying the model proved to be difficult and disappointing. Low power (19" loop of .051 pirelli weighing .044 oz.) put the CG at 105%. The cruise was excellent and the model flew well with 3/4 winds. All attempts to use more turns ended in uncontrollable stalls, fishtailing and loss of turn. Many hours were spent trying to cure the erratic behavior under full power. Dimensions were checked and re-checked, the alignment jig was checked; all was correct. Against my principles, 1/32" washin was put in the wing. Slowly increasing the size and weight of the rubber seemed to slightly improve the power handling; the CG was now at 100%. Time had run out for testing. The second model was assembled and the wing was pushed back 3/16" to put the CG at 100%; the model weight was .048 oz.

At the Nats the model did 23:23 on 2700 turns. The flight started with a violent stall and almost ended prematurely; it righted itself about a foot off the floor. Flying conditions were excellent - the model peaked just under the catwalk and came down slowly for 23:23. It was quite frustrating to know the rubber could take 500 more turns.

I thought that perhaps the design was too temperamental and nobody seemed to know how to correct the problem. The solution came from Bill Bigge just before the Nats ended. He suggested that I put a little slack in the body bracing, which was two strands of .001 tungsten wire strung very tight. Hmmm! Sure! I loosened the wire and tested with 2800 turns; the time was 23:10 from a normal takeoff that had normal turn and no evidence of a stall. With the model peaking under the catwalk there was more than enough room for a record try. Tony Becker (CD) agreed to a record attempt after all official flying was over. 3200 turns were put in, the takeoff was good, but after one turn it collided with another paper ship and the damage did not permit further flying. It is now evident that the 105% CG was correct and that a lighter model of this design might approach the half hour mark under ideal conditions.

POSTAL CONTESTS

Ann Arbor Airfoilers vs. Dallas Area - Jr. Jetco ROG
20' vs. 26' - Fudge factor = 1.14

John Galloway	Kevin Tenny	0:42.5
0:37.0 x 1.14 = 0:42.0		
Chuck Franz	Kristi Tenny	0:37.5
0:25.1 x 1.14 = 0:28.5		
Jim Galloway	Tony Wilder	0:37.0
0:15.6 x 1.14 = 0:17.8		

Ann Arbor Airfoilers vs. Dallas Area - HLG
20' vs. 26' - Fudge factor = 1.3

Jim Richmond	Bud Tenny	0:49.6
0:44.2 x 1.3 = 0:57.5		
Ned Smith	Eric Vogel	0:46.1
0:43.0 x 1.3 = 0:56.0		
ndy Richmond	Bob Reynolds	0:35.0
0:29.9 x 1.3 = 0:38.9		

NEWS FROM AROUND THE WORLD

AUSTRIA

Manfred Koller and Harry Meusburger made intensive preparation for a big event recently - a national indoor meet was scheduled in Vienna and they planned to enter. Two events are scheduled - 35 cm. microfilm and 35 cm. paper stick. Since cold weather arrived, the railway station has been heated, which ruins the flying there. Their flying has been restricted to a 5 meter gym and a 4 meter hangar. The hangar was the scene of a flying session after Manfred and Harry conducted a class for younger fellows, teaching them the basics of indoor.

CALIFORNIA - WILMINGTON

Although much of the activity at Wilmington Rec Hall has been indoor scale, recent reports have given the impression that North American Flightmasters have supported the activity. Many entrants at these meets have been Flightmasters, but the entire cost of the Wilhall operation is financed from entry fees and the management of the operation is carried on by J. O. Bailey. Mrs. Bailey helps with mailing the contest notices and other chores. Besides the scale activity, a lively rivalry has sprung up between Larry Renger and Ron Wittman in HLG. This should be very interesting in times to come!

The next two Wilhall sessions are scheduled for Jan. 14 and Feb. 11, 7 PM to 11 PM. The January session will be for indoor scale, with trophies for 1st in each class. The February meet will be the first sanctioned Record Trials in some time, and only bona fide AMA record class models will be permitted, so there should be a large number of fliers out.

CANADA

Two new areas of activity have opened up in Canada, both of them just getting started but very enthusiastic. At the RCAF Station in Gypsumville, Manitoba, several fliers have been granted periods of undisturbed use of the station gym; activity centers around paper models. In Drumheller, Alberta, another group of beginners has weekly access to a 25' gym, and they make full use of it.

INDIANA - KOKOMO

The January Kokomo Aero Team contest is scheduled Jan. 17 at Bunker Hill AFB. Events Easy B, HLG and Scale plus perhaps other events. Check with Chuck Borneman, 1401 West Taylor. Kokomo. Ind. 46901 for details and time.

MASSACHUSETTS - M.I.T.

The next MIT session is scheduled for Jan. 15, 1965, at the MIT Armory from 4:30 PM to 8:30 PM. Check with Jon Wexler, 362 Memorial Dr., Cambridge, Mass. 02139 for final confirmation of date and time.

MICHIGAN - ANN ARBOR

The January Airfoilers contest was Jan. 8, the next contest scheduled for Feb. 5 at Tappan High School (20'), with Easy B, HLG, Novice HLG, Jetco ROG and maybe Scale. Check with Dick Black, 1313 Covington, Ann Arbor, Mich. 48103 for more details.

NEW YORK - SYOSSET

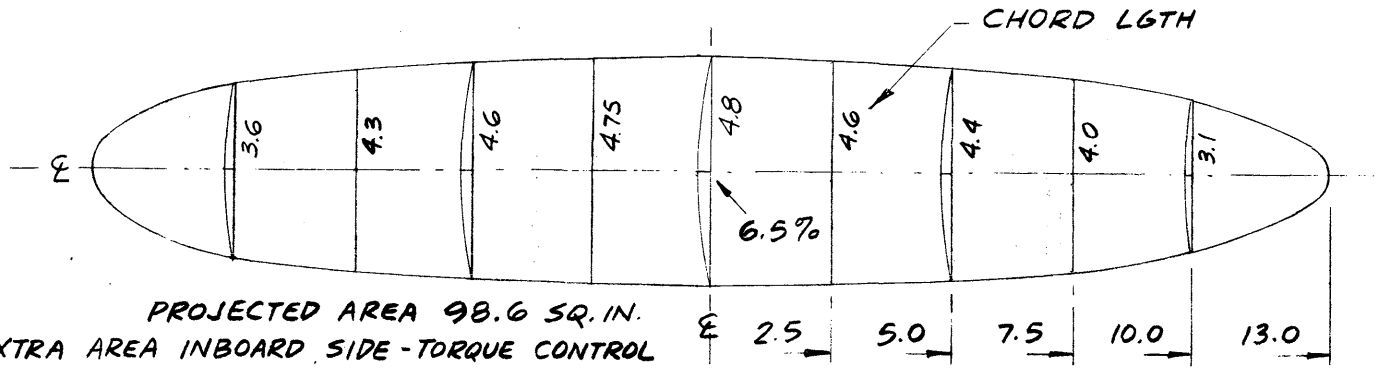
The Grumman Engineering Model Society will hold flying sessions on Jan. 20 and Feb. 3 at the Harry B.Thompson Jr. High School. The ceiling is 19' clear (below trusses); the flying time is divided thus: all models (your choice) - 7:30 to 9 PM, Indoor Rubber only - 9 to 10:30 PM, anything goes - 10:30 PM to closing. Call Mr. Jean Paillet for details - 515-MA 6-2825 (home) and 516-LR 5-2388.

OHIO - CLEVELAND

Besides the records listed elsewhere, the Dec. 12 contest at St. Edwards High School featured indoor scale. Bill Schubert won Jr. Scale with a Curtis Robin (1:50, 131 pts.), Herbert Schubert won Sr. Scale with a Curtis Robin (2:24, 258 points) and Ron Ganser won Open with a microfilm covered Curtis Robin (1:47.5, 147.5 points). The new scale event was successful enough to be continued at future meets. The rules awarded up to 50 points for workmanship and one point per second of flight. The next event (tentative) is a record trials at Cleveland Public Hall on Jan. 26. Check with Chuck Tracy, CLEVELAND PRESS, 901 Lakeside Ave., Cleveland, for details.

TEXAS - FT. WORTH-DALLAS

The Jan. 9 session at Arlington Rec. Hall had a very good turnout. Top times - Rubber - 11:34.8, Bob Putman; Easy B - 7:17, Bud Tenny; HLG - 0:52.5, Bud Tenny. This area will have another flying session on Feb. 6 at the Arlington site and a Cat. II contest on Feb. 20.

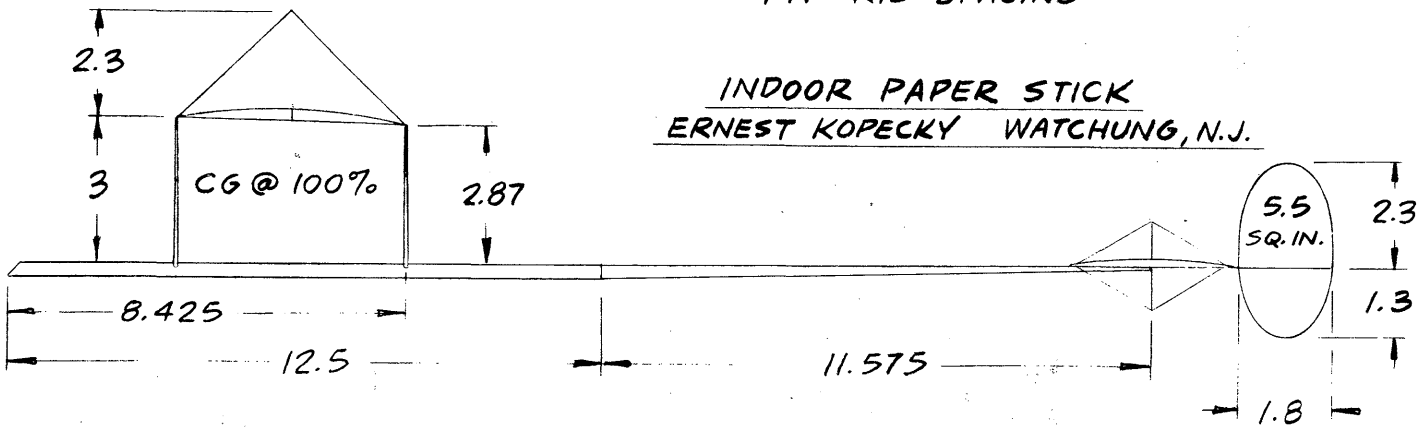


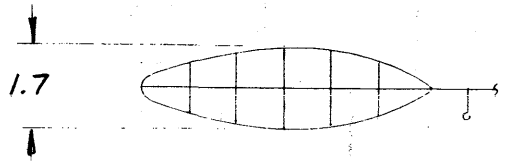
PROJECTED AREA 98.6 SQ. IN.
EXTRA AREA INBOARD SIDE - TORQUE CONTROL

TYP RIB SPACING

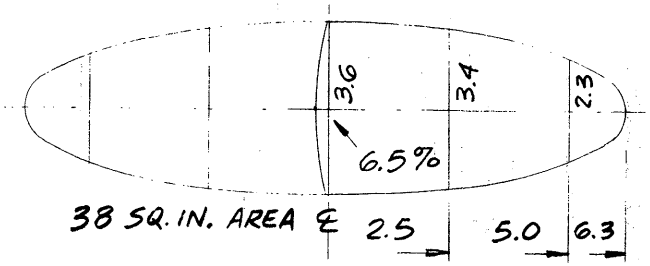
INDOOR PAPER STICK

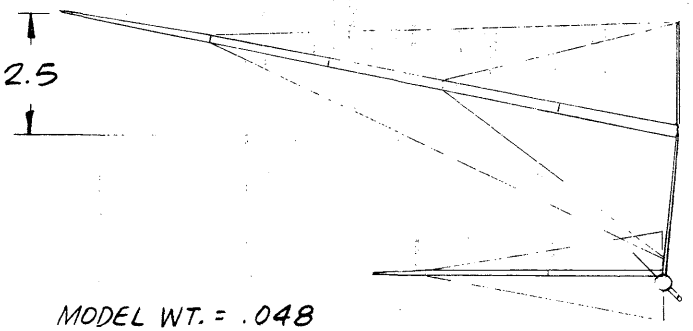
ERNEST KOPECKY WATCHUNG, N.J.





PROP : 13.5 DIA ; 22.4 P
13.7 □" AREA ; 6.5% CAMB





MODEL WT. = .048
RUBBER = .054
.102

POWER : .040 x .054 x 22
PIRELLI 2700 TURNS

WISCONSIN - GREEN BAY

Diligence paid off for Leo Northrup as he managed to set up flying sessions at the Green Bay YMCA every Sunday afternoon from 1 PM until late. Contact Leo at RFD #1, Shawano, Wisc. 54166 for more details.

VIRGINIA - HAMPTON

The Brainbuster Club held their first session of the season in the 24' Armstrong School Gym. Eleven fliers came out to crowd the small floor area; their results:

HLG (1 flight)		Rubber	
Joe Boyle II	0:17.5	Harold Crane	4:10
John Winfree	0:10.1	Hewitt Phillips	3:43
Win Winfree	0:09.0	Bob Champine	2:29

For info about future sessions, contact Bob Champine, 25 Beechwood Dr., Yorktown, Va. 23490.

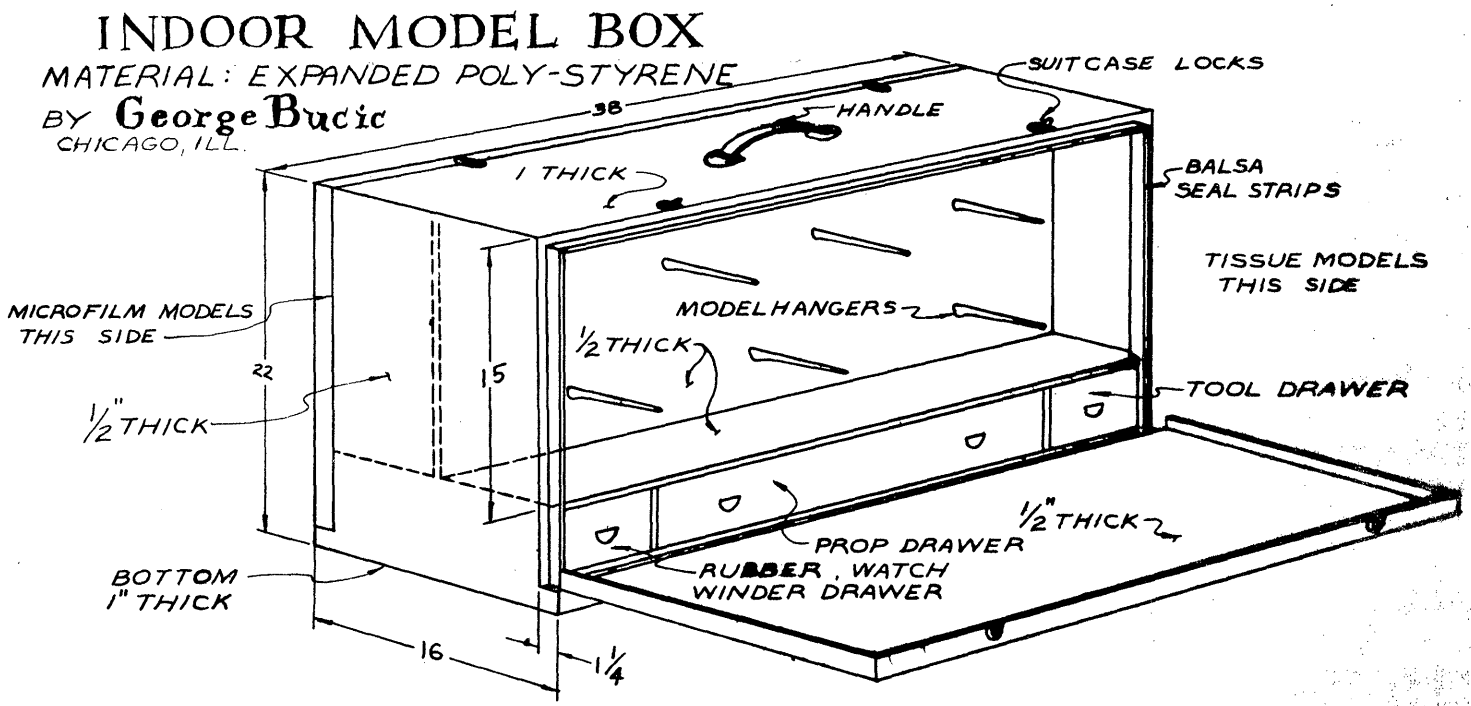
HINTS AND KINKS

Dacron Hints

After considerable experience in using monofilament dacron for bracing, several shortcuts and handling tricks have been developed to give better results or easier handling. For example, short pieces can be spliced with thin glue and rolled on a lightweight spool for easier storage. Just bring the ends together so they overlap a small amount and spread a small amount of very thin glue on the splice. Bill Bigge suggests that extreme care be taken when separating individual strands so these are not stretched - dacron has a delayed strain recovery and it may warp a braced wing as it recovers. When bracing a wing, run an entire section of bracing, anchoring only the start and finish. Check the alignment and tension in each segment - the dacron is slick enough to slide across all points and equalize all tension easily - and glue it down. Finally, work with a diffused light source opposite the work area so the light shines through the dacron - it lights up and is easy to see.

Indoor Model Box

George Bucic of the Chicago Aeronuts built his model box out of Poly-Expanded Styrene; it worked well except that it is so light it tries to blow away! This material weighs about 2 pounds per cubic foot; the hardware and fittings probably weigh as much as the material. George used 4' x 8' sheets 1/2" thick, cut with a razor knife and assembled with Elmers Glue. The outside finish is a water soluble wood filler covered with water-base paint. After the outside is finished, the doors are cut with a hobby knife and straight edge. The inside drawers and model hangers are attached with pins and Elmers Glue and the box is reinforced with balsa where the hinges mount. There is room for several models (using both sides), and all the necessary flying tools and accessories can be put in the drawers below. Other details and dimensions are shown on the drawing below.



MICROFILM TECHNIQUES

Part IV - Formulation and Pouring

After three months of discussing the ingredients of microfilm, it's about time to pour some! To review what facilities are needed: A waterproof tank at least 15" longer than your longest hoop and 12" wider than the widest hoop; a pouring device which gives some control

(cont. p. 5)

RECORDS? MAYBE!

CAT. I RECORD TRIALS, St. Edwards High School, 12/12/64
Lakewood, Ohio (33' ceiling)
Jr. HLG - 1:01.0, Bill Schubert
Sr. HLG - 1:00.3, Herbert Schubert, Jr.
Open HLG - 1:03.4, Gerald Skrjanc
Open Autogryo - 4:19.0, Ron Ganser
Jr. C Cabin - 3:48.0, Ronny Ganser

A LOOK AT YESTERYEAR

Recently Richard Sherman loaned me several 1934 and 1935 issues of Model Airplane News; in the Aug. '35 copy I found the following AMA records listed: (as of 6/8/35)

B Stick			C Stick		
Jr.	16:45.6	Roy Carlson	Jr.	18:53.4	John Stokes
Sr.	17:49.8	Ralph Kummer	Sr.	21:04.4	George Aspiotis
Open	15:17.8	William Latour	Open	22:59.4	Carl Goldberg

A R.O.G.			B R.O.G.		
Jr.	10:25.0	Joseph Pruss	Jr.	10:22.0	Bruce Mackler
Sr.	10:56.4	Merrell Malley	Sr.	15:00.4	Mayhew Webster
Open	9:50.0	William Latour	Open	14:02.8	William Latour

A R.O.W.			B R.O.W.		
Jr.	3:46.0	Willaim Wert	Jr.	8:37.6	James Mooney
Sr.	5:01.4	Paul Karnow	Sr.	11:55.0	Mayhew Webster

B Cabin			C Cabin		
Jr.	10:44.0	Bob Jacobson	Jr.	12:59.4	Hyman Oslick
Sr.	12:23.5	Herb Greenberg	Sr.	13:24.0	E. Enderlein
Open	6:48.0	William Latour	Open	12:31.8	William Latour

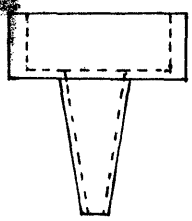
Autogyro		
Jr.	0:57.2	Raymond Steinbacher
Sr.	2:01.2	Alton DuFlon, Jr.

Class A HLG			Class B HLG		
Jr.	0:26.6	Kenneth Nelson	Jr.	0:27.0	Louis Young
Sr.	0:34.4	David Hecht	Sr.	0:31.6	David Hecht

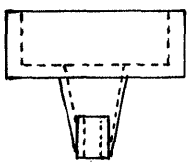
Class C HLG			B Cabin ROW		
Jr.	0:17.0	Stan Congdon	Jr.	3:23.0	John Stokes
			Sr.	3:11.0	Bruno Marchi
			Open	5:42.0	William Latour

the rate of flow of the solution onto the water; and many hoops with safe storage to match. Good hoop sizes and wood sizes are: 8" x 18" (1/4" sq. hard balsa), 8" x 30" (1/4" x 3/8" or 3/8" sq. hard balsa) and 9" x 40" (1/4" x 1/2" or 1/2" sq. hard balsa). Hoops should be assembled carefully with good glue (epoxy is excellent) and with reinforced corners. If the hoop is not rigid, you may [illegible]e a sheet of film when the hoop "gives" slightly. The [illegible]m side of each hoop should be smooth; if you plan to use rubber cement to adhere the film to the hoops, the hoops can be doped and sanded smooth.

One pouring device which works well is the modified plastic squeeze bottle with the tapered removable top as shown in Fig. 1. The top (or spout) can be cut off until the hole is the proper size, or it can be cut shorter so a series of interchangable orifices can be used. I have 12 orifices ranging from #30 drill size to #49 drill size and all of them have been used during the experiments which support this series of articles. Besides the modification to the spout, the bottom is cut out of the bottle so film solution can be poured in easily. In use, the pouring spout is held between the thumb and first two fingers and the little finger covers the end of the spout and acts as a valve during the pour.



Cut off end of spout until the end has the proper inside diameter.



Teflon or nylon insert drilled to desired size. Make a set of different sizes, interchange them for best results.

Figure I

The mechanics of pouring require practice to insure the best results, especially when you get particular about the uniformity of each sheet. You must develop a smooth arm sweep which spreads the solution uniformly in a straight line down the tank. If you use 30 cc or more solution in the pouring spout, the rate of flow will be reasonably uniform during the pour; the smooth arm motion then insures a uniform sheet of film. That is, if every thing else is right you will get a uniform sheet of film! If you use too large an orifice, the solution can "burble" as it comes out (you will have to use a very fast arm movement to get a thin sheet) and the colors will be very uneven. If you have too much fast thinner in the film formula (see Part II, Nov. '65 INAV) you can get the same effect; if you hold the pouring spout too high above the water it will also give striped film. To summarize, your pouring motion must be uniform, the film solution must pour out of the spout smoothly, and the height of the spout above the water must be uniform and as small as possible. In fact, the closer you can get the spout to the water, the better will be the results you get.

In the past, considerable commentary has been made about water temperature. If you have a proper balance of solvents (see Part II), water at room temperature or cooler will work very well. The tank should be located out of any drafts - moving air will cause uneven colors (usually large areas of gradual color change) and perhaps moving air will cause uneven curing and wrinkles. You should make a pour and wait about 5 minutes by the clock before putting the hoop on the film. I usually wait until after pouring to coat the hoop with rubber cement, which helps enforce the 5 minute wait. The wait ensures that the film has cured properly on the water, which will mostly eliminate shrink breakage on the hoop (the film "explodes" some time before the water drains off) and gives less film tension on the hoop after the film cures. Some films do not permit this leisurely approach, and will wrinkle badly within 60 seconds after pouring; this is most likely due to solvent imbalance if the film is stable after ageing.

The mechanics of making "home brew" can best be covered by a couple of examples; but general principles can be outlined first. All mixing should be done in graduated bottles or containers (empty prescription bottles are inexpensive at most drug stores) and detailed records should be kept of each step. You don't have to do it that way if you just like to tinker, but repeatable results absolutely depend upon careful measurements and accurate records. Each bottle should be marked to identify the contents - almost all microfilm looks alike, but it usually doesn't act alike.

Example I - Mix film from 60 sec. N/C (dissolved in 50% Methyl Ethyl Keytone and 50% Butyl Acetate)

20 cc 60 sec. N/C
30 cc Thinner #1 (4 parts MEK, 2 parts Butyl Acetate and 1 part Amyl Acetate)
10 drops Benzyl Butyl Phthalate

This formula spread poorly, and the films broke after lifting. 42 cc of the mix was left; to it I added 10 cc 60 sec. N/C, 5 cc MEK and 5 drops BBPH. The spread was improved, but sample sheets still broke after lifting. The remaining mix was labelled N/C 15 for storage, and the solvent balance figured to be: 56% MEK, 38.5% B/A and 5.5% A/A. After appropriate calculations, 20 cc N/C 15 was poured into a new bottle and 25 cc MEK, 2 cc A/A and 10 drops BBPH were added. (New solvent balance - 76.5% MEK, 16.4% B/A and 7.6% A/A). The new mix poured very well and, after two weeks ageing, went very slack on the hoop. The mix can now be re-created from notes, but only 50% as much plasticizer added. This must then be poured and aged to check on stability, and suitable tests made for other characteristics.

Example II - Mix film from Lambert #2035 Clear Dope.

Using a #30 jet, the straight dope would only drip, but each drop seemed to spread well. To 40 cc of dope, I added 15 cc Acetone. This mix poured blue film easily, picked up all right, and generally looked good. I had expected excessive wrinkling that did not develop. To get lighter film, I changed from #32 jet to #38 jet and then poured silver film which also picked up well with minimum wrinkling on the water. Sample labelled Dope I. Because the stability of this mix was suspect, I then mixed 3 cc Non-tautening Butyrate dope with 22 cc Dope I, and labelled it Dope II. When poured, this material did a strange thing. It split into two narrow strips of very unevenly colored film. Addition of 10% Amyl Acetate did no good (poor guess), so 20% acetone was added. This did the job - at least for the 6" x 12" test hoop. A later attempt with large hoop was foiled by shrink breakage. Due to lack of time, this batch was re-labelled Dope II A and set aside. Meanwhile, 30 cc of Dope I was plasticized with 40 drops of Di-cyclohexyl Phthalate (DCHP is a crystalline solid which is soluble in Acetone; I added DCHP to acetone until no more would dissolve, then added 10% more acetone to create a just-less-than-saturated solution as a repeatable standard). This mix poured gold film easily from a #38 jet; it was labelled Dope III. After two days of ageing, shrink hoops (2½" dia. balsa hoops made from .024" sq. balsa) were covered with Dope I, Dope II and Dope III. After four days of further ageing, none of the shrink hoops have warped, but six weeks will be a better test.

Example III - Modify an existing mix for better handling.

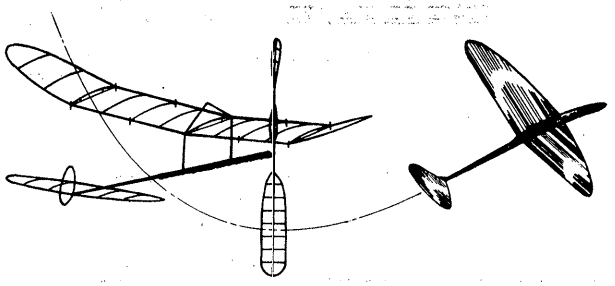
This material suffered from poor spreading and thin sheets were too weak to be picked up or collapsed after picking up. Successive additions of acetone (amounting to 24% total) improved the handling enough to permit an 18" hoop to be picked up. However, a slight strain on the hoop during storage caused the sheet to explode - it was very brittle. The addition of 17% 60 sec. N/C made a tremendous difference - the spread and handling was very good, and a gold-silver sheet was easily lifted and it survived to make it into the storage box. Since unplasticized N/C was added, this mix needs to be checked for stability before final acceptance.

It is hoped that the above examples will cover most of the troubles which will arise for those who want to mix their own film. Example II was chosen to help those who wish to try dope as a base material in spite of the lack of control of additives (those put in the dope by the manufacturer) which may or may not be beneficial to microfilm. Actually, preliminary tests of this microfilm made from Lambert #2035 Clear Dope show very good quality film; probably good enough (if the stability is good) for all but the most exacting applications.

Part IV concludes the discussion of microfilm mixing; that is; the care and feeding of the beast. In future issues various other topics such as storage, testing and general handling techniques will be discussed; if anyone has specific topics or questions they will be welcomed. Meanwhile, the first four parts of the series should not be taken as the last word - if you have a dissenting idea or a different way of doing it, you may present your side of the picture. I am grateful to Dick Kowalski, Bill Biggs, Dick Ganslen, Joe Hindes, Curtis Janke, Frank Cummings, Ernie Kopecky and any others I may have missed for all the help (aside from manufacturers) I have had in the preparation of this series. I sincerely hope this material has been helpful to those who like "home brew."

The Voice of N.I.M.A.S. FEB·1966

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members

BERNARD BISHOP, 11127 Clifton Rd. Apt. 8, Cleveland, Ohio
HAROLD CRANE, 4002 Buchanan Dr., Hampton, Va. 23369
JAMES A DALEY, JR., Page Hill Rd., New Ipswich, New Hamp.
KENNETH R. FITCH, 12 Sellger Court, Huntington Sta., New York 11746
PHILIP KLEISLER, 175 Fredrick Ave., Babylon, N. Y. 11702
WILLIAM H. LEE, 802 8th St. Apt. 103, Laurel, Md. 20810
GEOFFREY SAUTER, 27 Chase St., Orange, Massachusetts
WAYNE A. ZINK, 1148 Melbourne Dr., New Haven, Ind. 46774

Sponsored Junior Memberships

One of the NIMAS programs which has been sort of inactive for lack of nominees has been the Sponsored Junior program. This program was initiated in Feb. '63 by a NIMAS member's donation toward a special fund to encourage Junior participation in NIMAS. For the benefit of recent NIMAS members who haven't heard of the program, it is intended for those youngsters with limited budgets who, in the opinion of the nominating member, show promise and interest in indoor models. Also, those youngsters who are isolated from club activity or who lack the outside guidance and help needed to follow up on their interest in indoor models are likely candidates. Juniors can be nominated by individual NIMAS members or by clubs, following the general outline above. The nominator will then notify NIMAS Hq., Box 545, Richardson, Texas 75081 of the name of the nominee and give pertinent details. We will then contact the nominee and request a brief autobigraphical sketch and the $1 membership fee. The NIMAS special fund then furnishes the additional $2 to make up a full NIMAS membership for one year.

We have a new Sponsored Junior Member, nominated by Dick Black. He is John Galloway, 1715 Mershon Dr., Ann Arbor, Michigan. He is a member of the Ann Arbor Airfoilers and started building models in 1963 after attending an Airfoilers meeting. He has flown some control line and currently has an interest in starting outdoor FF with 1/2A and Coup d'Hiver. He has accumulated several small trophies and ribbons from club contests, but his real pride is his first place trophy for Novice HLG at the Detroit State meet in 1964. Besides HLG, John is flying Jetco ROG and Easy B in the Airfoiler contests. Welcome to NIMAS, John!

AMA Club Charter

On page one of the Jan. '66 MODEL AVIATION you will find an announcement of new AMA club charter procedure and some mention of the insurance provided automatically when a club is chartered. Full details of this program can be gotten from the officers (V. P., Contest Board members and Contest Coordinators) of your AMA District. AMA seems to be making a concerted effort to improve the services offered and each club that flies powered models should investigate this new program.

Family Memberships

In recent weeks, there have been father-son teams joining NIMAS; a trend which makes me very happy. This is the sort of thing which will insure that indoor will remain a growing sport. In order to encourage this sort of thing further, NIMAS is now open to family memberships. That is to say, with any regular membership in NIMAS, the other indoor fliers in the family below the age of 21 can share the INAV subscription and otherwise be counted as full NIMAS members. The cost is 50¢ per year per extra family member. The first three additions to NIMAS via family membership are Charles Wiechard III, 36 Iriquois Rd., Levittown, Pa. 19057; Kenneth R. Fitch, Jr., 12 Sellger Court, Huntington Sta., N. Y. 11746; and Jesse F. Shepherd, Jr., 5312 Odessa, Ft. Worth 15, Texas.

POSTAL CONTESTS!

NIMAS Easy B Postal Meet

Bob Putman suggested that we have an Easy B postal meet, and volunteered to handle the paperwork. If it is popular enough, it can become an annual event.

1. Wing span - 18" max.; chord 3" max., paper covered, prop blades all balsa, solid stick, solid boom, no bracing.
2. Use AMA flight rules covering indoor stick; flights must be made at one session only; flights must be completed and entry postmarked no later than March 31, 1966. Entry fee 15¢; stamps preferred. Special event for Juniors; all other ages combined. Flights must be timed by an AMA member, preferably a C.D.
3. Send entry fee and record of completed flights signed by timer to: Bob Putman, 507 Darlene, Arlington, Tex. Be sure to send the ceiling height of your site with your entry; all entries will be corrected via fudge factor to the highest ceiling height.

Postal Contest Results

San Diego Orbiteers (22') vs. Kokomo Aero Team (45')
Fudge Factors: Rubber 1.42; HLG 2.02

Easy B (Paper Covered)

Jim Richmond (Kokomo)	10:57.0
Jim Bennett (Kokomo)	10:19.6
Clarence Mather (Orbiteers) 6:53 x 1.42	9:39.6
Fudo Takagi (Orbiteers) 6:08 x 1.42	8:42.0

HLG (Two flight total)

Tom Ottiwell (Orbiteers) 0:46.6 x 2:02	1:34.1
Bob Larsh (Kokomo)	1:28.4
Jim Richmond (Kokomo)	1:07.4
Dave Burke (Orbiteers) 0:21.1 x 2:02	0:42.6

Dallas Area (26') vs. Ann Arbor Airfoilers (20')
Fudge Factors: Rubber 1.14; HLG 1.3

Jetco ROG (Novice Jr.)

Kevin Tenny (Dallas)	0:45.0
Chuck Franz (Ann Arbor) 0:31.7 x 1.14	0:36.2
Kristi Tenny (Dallas)	0:34.5
Ricky Blythe (Ann Arbor) 0:20.5 x 1.14	0:23.4

HLG (Two flight total)

Bud Tenny (Dallas)	0:52.5
Eric Vogel (Dallas)	0:51.4
Ned Smith (Ann Arbor) 0:37.8 x 1.3	0:49.2

Easy B

Bud Tenny (Dallas)	7:17.0
Ned Smith (Ann Arbor) 4:34.2 x 1.14	5:12.0
John Galloway (Ann Arbor) 2:12.9 x 1.14	2:31.0

Dallas Area (26') vs. San Diego Orbiteers (22')
Fudge Factors: Rubber 1:09; HLG 1.18

Easy B Paper Covered

Bud Tenny (Dallas)	7:17
Clarence Mather (Orbiteers) 6:32 x 1.09	7:04.8
Fudo Takagi (Orbiteers) 5:33 x 1.09	6:00.0

HLG (Two flight total)

Tom Ottiwell (Orbiteers) 0:45.9 x 1.18	0:54.1
Clarence Mather (Orbiteers) 0:45.5 x 1.18	0:53.8
Russ Seley (Orbiteers) 0:44.5 x 1.18	0:52.5
Bud Tenny Dallas)	0:52.5
Eric Vogel (Dallas)	0:51.4

STATE OF THE ART

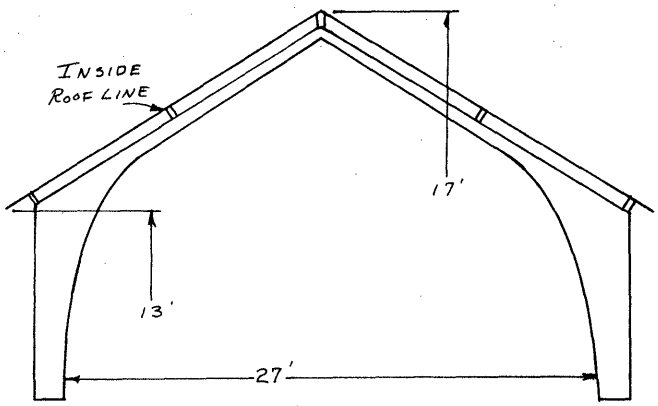
Jim Mayes and Bob Trampenau, the guiding lights of the Elmira (N. Y.) Indoor Model Airplane Club, have been limited to 18' and 20' sites for their activity. As a result their HLG times have been low compared to regular Cat. I times, but Jim and Bob nearly always win postal meets they fly in. Just as with "Stompette" (Dec. '65 INAV), the 18' - 22' sites are fairly numerous and models which work well there are too light for higher sites.

The model of the month, Bob Trampenau's Lo-Ce IV, is an outstanding example of low-low ceiling state of the art, and has done 0:23 in the 20' Elmira site. He flew it for me at the Nats, and it flew beautifully with a left-left pattern. It flew "over the top" into the glide pattern with no loss in altitude and settled very slowly like a good glider should.

THE LAB

Flight Test Report

Bill Gieskieng of the Martin Model Masters reported a very interesting modification for Indoor HLG (p. 164, 1964-65 Zaic Y. B.) which gave improved rate of sink; he also mentioned a similar approach by Hal Blubaugh. After correspondence with Hal, I just had to try it. The only site available at odd times was small (see sketch below), so part of the problem was to develop a glider to fit the site. I wound up with two ("Plain Vanilla" I & II), so that one could serve as a warm-up glider and control; the second glider would be alternately flown with and without the Blubaugh "fence." Plain Vanilla I became the test vehicle, since it was by far the most reliable and held trim from session to session. Early sessions yielded 0:19.5 for high time in the small site; flights in a high ceiling showed the ultimate time for this glider to be around 0:31. (similar tests for P. V. II showed 0:25 to be about tops; it is better suited to the small site).



To better evaluate the performance of these gliders, certain ground rules were adopted. All flights which did not hit anything during the flight were recorded; this is some indication of the reliability of the design. All flights which collided with an obstruction were omitted; it seemed unfair to the glider to count gross "pilot errors" against the machine.

The first flight test session consisted of 30 flights with the fence and 30 without; fence flights first. With the fence: High time - 0:21, low time - 0:17, 30 flight average - 0:18.8. Without fence: High - 0:20.9, Low - 0:20.9, Average - 0:18.3. This gave 2.7% edge to the fence, but I noted that launch accuracy and peak altitude kept improving; the last 10 flights w/o the fence peaked right at the ceiling and 5 of the 10 were the only ones in the series to top 0:20.

To help prevent the warm-up from affecting the test, the next session started with 15 flights on P.V. II. The results: High - 0:21, Low - 0:17.5, Average - 0:19.2. Fifteen flights on P.V. I were made in each mode, the first 15 were made w/o fence: High - 0:21.2, Low - 0:19, Average - 0:19.5. With fence: High - 0:22.9, Low - 0:19.4, Average - 0:20.8. The fence performance was 6.7% higher - enough to win a contest. I now have a witness for these times (I find them hard to believe); Lynn Adams recently visited and witnessed 0:22 with P.V. I and did 0:20.5 with P.V. II himself.

My correspondence with Hal led me to expect little change in flight trim when the fence was added; all it took was the addition of about .0007 oz. of clay to the nose. Flight performance was radically changed, with both plus and minus factors. First, it became necessary to throw very hard to reach the ceiling, and the precise launch angle was more critical. However, less altitude was lost in the pull-out, forward speed and rate of sink were noticeably reduced, and the recovery in turbulent air was improved. Without the fence, the glide attitude is level or slightly nose-up; with fence in place the attitude is slightly nose-down. Hal used a .1" fence on a Sweepette-sized glider, my fence was .09" deep. It is unlikely that I had the optimum fence on the first try I plan to try other sizes also. Some preliminary tests with other gliders did not yield useful results, with the primary difficulty being in finding proper launch trim. If you plan to try it, allow plenty of time to learn to fly the glider. If you do try it, please keep systematic records and let me know how it comes out!

The Airplane

Sketchy plans for Plain Vanilla I and Plain Vanilla II are at the bottom of the plans page; numerical dimensions shown are the same for both gliders and those which differ are summarized in the table below. Very careful choice of wood is needed to get the light weights; the wing was 4.5# 1/20" balsa sanded very thin at the tips. An airfoil with high point at 33% was sanded in; the wing was scored at 33% and .09" undercamber bent in. Leading edge reinforcement is mandatory; four strands of dacron sewing thread twisted together is very efficient. Square tips are shown on the plans; small rounded corners are optional and improve the appearance. The wing is offset 1/16" toward the inside of the glide circle; I used a right-right pattern with a nose-up launch banked into the glide. At the peak of the launch, both models would drop off into the glide circle. This type of launch works well with a peaked-roof site; with care, the launch can be less steep so the glider flies "over the top" very close to the ceiling - this for flat roofed sites.

	P. V. I	P. V. II
A	6"	7.25"
B	1 5/8"	2.1"
C	7/8"	1"
D	1 3/8"	1.5"
Wing Area	29 sq. in.	36 sq. in.
Weight	.08 oz.	.09 oz.
Wing loading	.00275 oz/sq.in.	.0025 oz/sq.in.

FAI INDOOR REPORT

No World Records Yet

After making formal announcement of the new ceiling categories (Jan. '66 M. A.), AMA noted that the newly established FAI ceiling categories were provisional only; they must be formally approved before international marks can be set in these categories. The Nov. '66 CIAM meeting will be the earliest date for this approval, so we have to wait for the '66-'67 season to establish records in these new categories.

More about FAI Sanctions

Although we won't have a use for FAI sanctions now for a while, here is information to supplement that in the Jan. '66 INAV: Once applied for, the sanction is good for one year or one record. If a record application is disallowed for any reason, the sanction is still in force. If the C.D. of record wishes to try for a record on that sanction, another C.D. must be on hand to supervise and certify the flight. For indoor, one sanction will cover all ceiling height until a record is set. If two records are set on one sanction, the second will be honored upon receipt (by H.Q.) of another $10.

HINTS AND KINKS

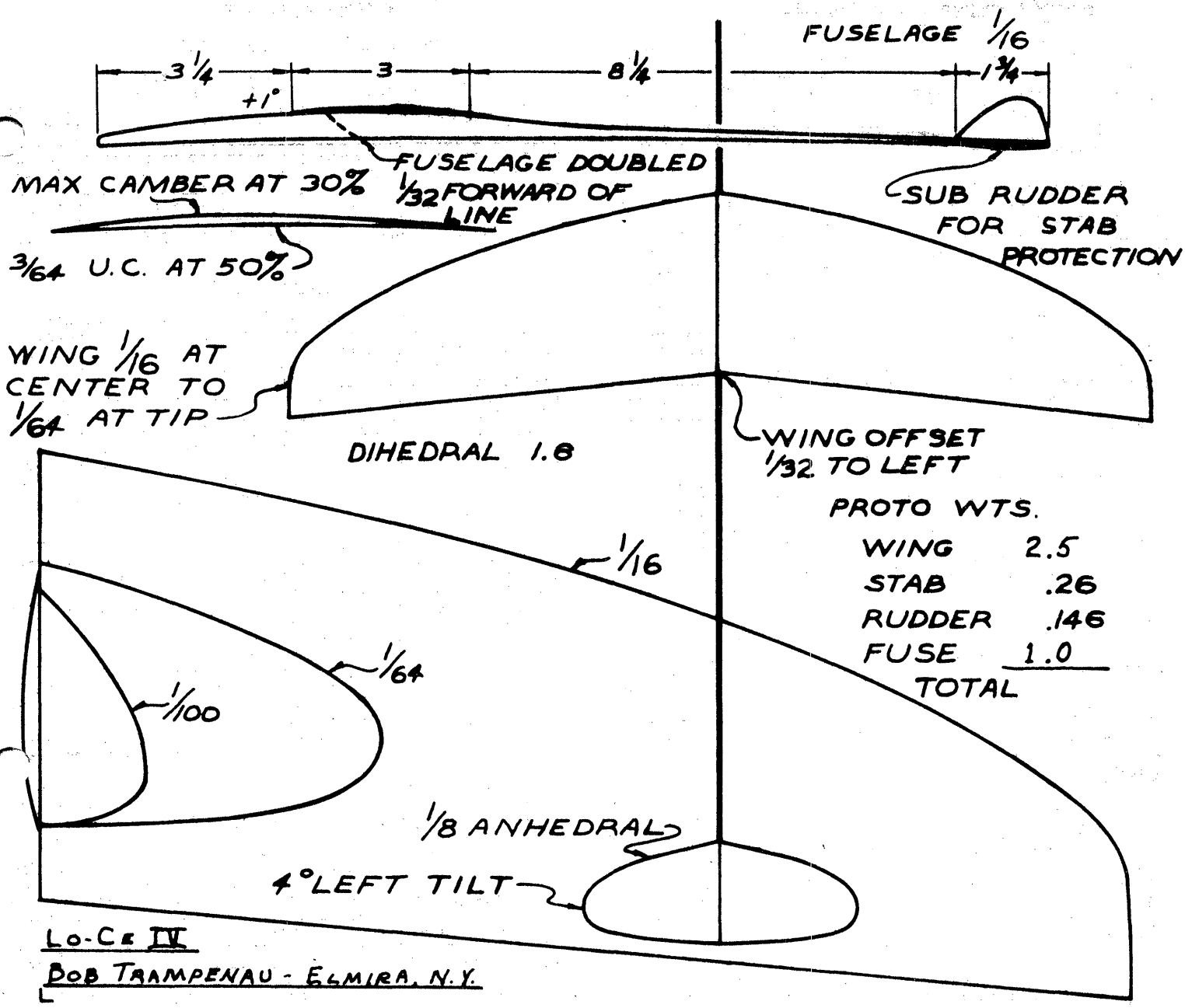
New Marker Pen

In recent months some new marker pens, made in Japan and featuring bamboo tips, have become available for low cost. The ink in the pens is water soluble, fast-drying and comes in various colors. Joe Hindes suggests that these are excellent for marking on balsa wood, since the ink doesn't spread out and the point won't damage the wood. Joe Also suggests that these points can be sharpened with a razor blade. Prices 39¢ to 59¢ - a bargain.

Warped Strips?

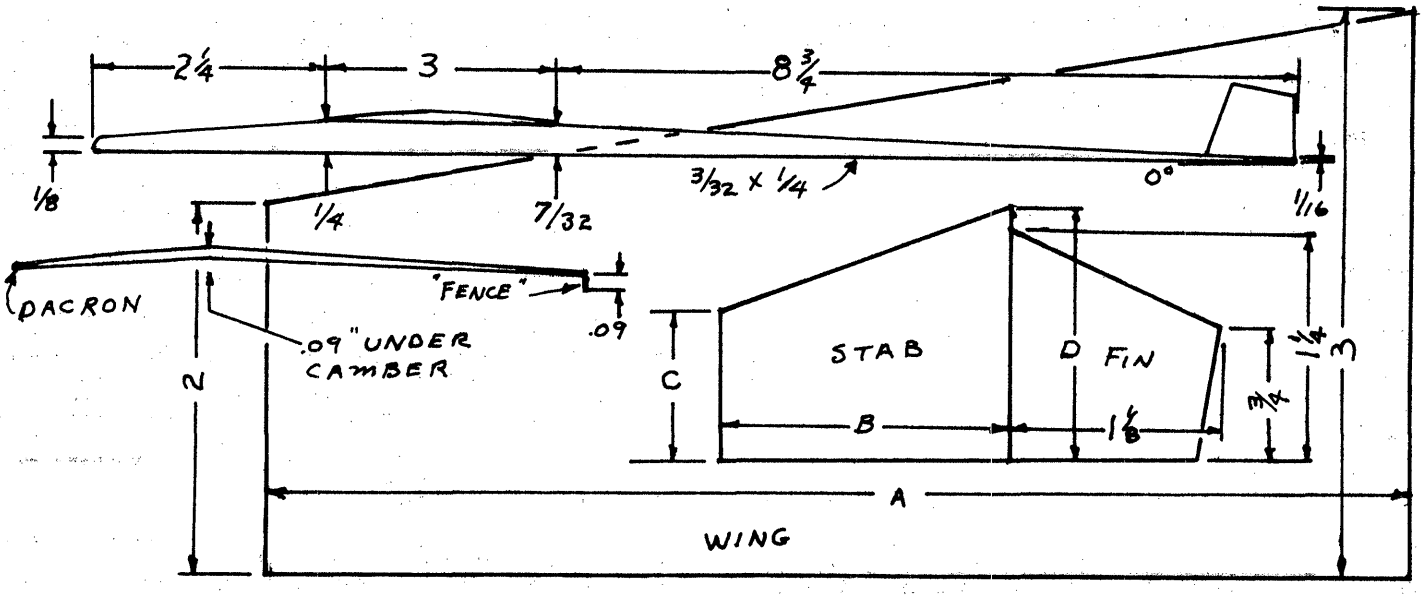
If your spars warp after being cut, Leo Northrup says they can be straightened out by running them between the thumb and forefinger (pull them through while holding a slight pressure). Or, if you need strips with a slight curve, you can curve them by similar action, except that you hold the thumb and finger at a slight angle so the wood curls slightly.

Feb 66



LO-CE IV

BOB TRAMPENAU - ELMIRA, N.Y.



PLAIN VANILLA I & II

NEWS FROM AROUND THE WORLD

AUSTRIA

The indoor meet in Vienna was marred by drift caused by in-the-floor heaters, and lighter models lost out due to their relatively faster drift. Entrants flew in four classes: a paper covered 35 cm. model similar to Easy B; a 35 cm. paper model (full house); and 35 cm. and 90 cm. microfilm models. Top time for the meet was in the 90 cm. microfilm class - 6:45.

CALIFORNIA - SAN DIEGO

The San Diego Orbiteers are going to start flying in the Madison High gym - a 30' site with obstructions down to 26'. This will be quite a change from their 22' site (smooth ceiling) they have been used to. Contact Clarence Mather, 3880 Ecochee, San Diego 92117 for details.

CALIFORNIA - WILMINGTON

The February 11 session at Wilhall will be for AMA record classes only - and this ought to be a good one. It is the first Cat. I RT at Wilmington in a long time; and some of the earlier sessions produced records which have lasted for over four years! The March 11 session at Wilhall will be the WIMAC Fourth Annual Scale Contest, with classes for regular scale and the special sheetwood classes.

COLORADO - DENVER

The Martin Model Masters are going all-out with their last two contests of the season, with Paper Stick, Indoor Stick, Easy B and HLG for regular events and a special event for novices - a "Skeeter" event. The first meet is scheduled for Feb. 20 and the second for March 20; both are set up for the Hinkley High School Gym in Aurora, Colorado. For more details contact Mike Des Jardins, 8314 E. Kenyon Dr., Denver, Colorado.

INDIANA - KOKOMO

The January Kokomo Aero Team contest was cut short by a mis-understanding of schedules; they still had very good times, including a new site record in HLG. Bob Larsh's 0:44.4 (single flight) handily won HLG, Jim Richmond's Easy B continued its string of wins with 10:57, and Ron Ridgeway won Jr. HLG with 0:30.6. The February contest is set for the 20th at Bunker Hill AFB. Contact Chuck Borneman, 1401 W. Taylor, Kokomo, Ind. 46901.

NEW YORK - SYOSSET

The Grumman Jan. 20 contest, held at the 19' Thompson Jr. High School, was a huge success. Prizes for the Jr. classes were miniature airplanes donated by Grumman, Open fliers won quantities of Randolph dope. Five year old Barry Paillet topped older fliers in Jr. HLG with 0:09.4; Kenneth Fitch, Jr. won Jr. Easy B with 3:03; Karl Birkel won Open HLG with 0:19.3 and Henry Prew won Open Easy B (mike covered) with 5:24. Their next sessions are set up for Feb. 17 and March 3.

OHIO - CLEVELAND

The 15th Great Lakes Indoor Air Meet had over 5000 official flights in 20 events; the longest single flight was by Bob Randolph as he won Open Stick with 14:15. Joe Hindes repeated last year's win in Paper Stick with 14:11, using the same model as before. Other winners: Jr. Paper Stick - 8:13, Glen Jackson; Sr. Paper Stick - 13:09.5, Neil Shipley; Jr. Stick - 10:20, Arthur Markiewicz; Sr. Stick - 11:08, Louis Casaregola; Jr. HLG - 1:49, Arthur Markiewicz; Sr. HLG - 1:50.8, Bill Schubert; Open HLG - 1:49.6, Norman Getzlaff.

TEXAS - FT.WORTH-DALLAS

The Feb. 6 session at Arlington Rec. Hall (26') was well attended, and some good times were put up. Bob Wilder's paper stick topped the rubber times with 11:08, while Bud Tenny's experimental glider using the Blubaugh fence got 0:29.2. Jerry Murphy's paper stick lost its rudder and still completed three circles, wandering only when it hit turbulence - this with a right turn! Bob Putman's Easy B downed a HLG without damage - it kept on flying as if nothing happened! This session was the last before the Cat. II contest on Feb. 27 - entries received before Feb. 20 get a chance at a door prize. Events: HLG, Paper Stick and Scale; Jetco ROG for ages 12 and under. Bob Wilder, 2010 Boston, Irving Texas

WASHINGTON, D. C.

The "grudge" match between Frank Ehling and Tom Vallee was postponed until the Maxecutors session on Feb. 28 - the stakes still a Chinese dinner. Several Maxecutors showed up with 7 1/2" paper stick models for one of the meetings - Dan Belieff won a deluxe hamburger and soft drink with his 1:57 flight in the small club room. For details about Maxecutor sessions, contact Tom Vallee, 9136 Edmonston Ct., Greenbelt, Md. 20770.

MICROFILM TECHNIQUES

Part V - Miscellaneous Topics I

Curtis Janke pointed out that still air is not always desirable for optimum film pouring conditions; in the case of some solvents which are quite heavy, they tend to gather above the film and inhibit further evaporation. This is a valid point; it does not conflict with the id that still air is necessary during the pour and for about 30 seconds after. Moving air will definitely contribute to uneven color of a sheet, if it occurs during the first few seconds of film formation. The answer is to gently fan the sheet after the pour as Curtis suggests; by the time you get around to another pour the disturbance will be settled down.

Covering Method #1

The so-called "German type" wing requires special covering and bracing techniques to produce the smoothly curved elliptical dihedral and the smooth, taut film surface which contributes to the structural efficiency of this type of construction. (Historically speaking, all these features had been seen on American models before WW II except for the concept of ultra-light wing frames which used the film as part of the structure; more than one designer had used elliptical dihedral and the film was all tight. However, the tight film was not as well planned and controlled as modern film, and thus the wing structure was heavier to withstand the pull of film that wasn't quite stable.)

The following covering and bracing method is submitted by Joe Hindes; it is very similar to the method used by Dick Kowalski. The top half of page 5 shows the jig used for covering; it is made from a piece of aluminum siding with one edge left intact to hook over the edge of the table and the other edge folded down or cut off. The wing outline is scribed onto the aluminum,and holes drilled in the base allow trapped air to escape. The wing is laid on the scribed outline and wet down using a fine camel hair brush and using care to keep the area inside the wing dry. Then the area 1/4" outside the wing is wet down and the wing covered in the regular Bilgri manner.* After the water (actually a mixture of water and window cleaning solution) is dry, preferably after waiting overnight, Joe inverts the jig and carefully tightens the film with the heat from a soldering iron (Kowalski uses an infrared heat lamp) before removing the wing from the jig. The bracing jig, shown also on page 5, is standard Bilgri type, 1/8" smaller than the wing outline. The wing is blocked up with 1/16" sheet pieces tack glued in place as shown; the pieces vary in height toward the tip to produce the elliptical dihedral. The wing spars are also tack glued to these dihedral blocks, the bracing jig inverted and (very carefully!) the slack created by the dihedral is shrunk up with heat from the soldering iron. If this is done after the bracing wires are applied, the main danger is that you will distort the airfoil. Just before removing the wing from the jig, the tip bracing wires should be made tighter; just enough to place the tip spars under tension and insure a rigid wing.

*For those who haven't seen the indoor articles by Joe Bilgri (Mar., Apr., May 1960 M.A.N.), they are worth looking up. Anyway, the Bilgri covering method as outlined in these articles is as follows: The surface to be covered is wet down to a board as above, the area outside the surface is wet down, and a hoop with slack film is placed over the surface. The film is then blown down onto the wet surfaces and permitted to dry; it can be cut loose from the hoop anytime after it is stuck down and the covered surface is trimmed loose from the table after all moisture is thoroughly dry.

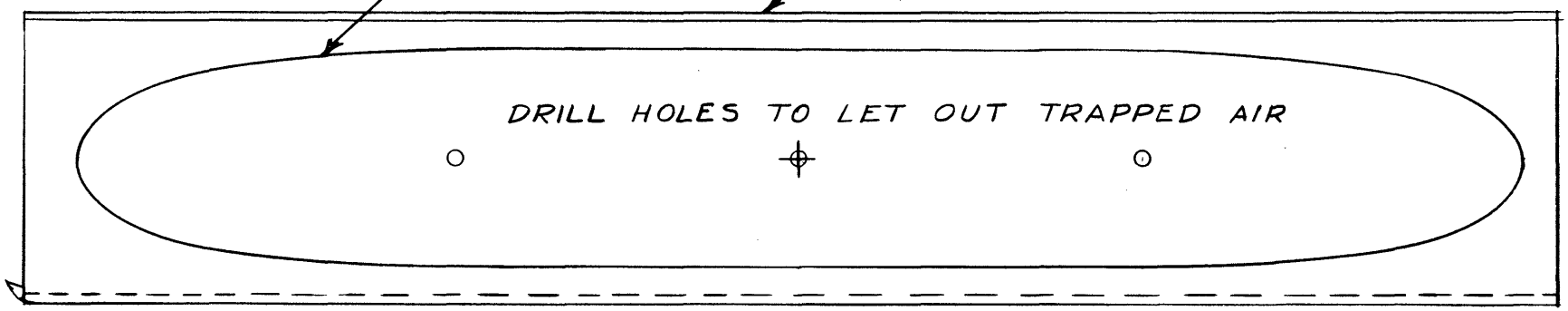
A LOOK AT YESTERYEAR

In answer to my question, "When was condenser paper first used?" Bill Lindsay sent me a piece of condenser paper dating back to 1931. His father was in the paper business and got him a roll of it, which he used for indoor models until 1933 when microfilm took over. He has continued to use it for scale models and small outdoor models. Can you top this? Has anyone else used condenser paper earlier than this? Still unanswered is the second part of my question, "When was our present Paper Stick event created?

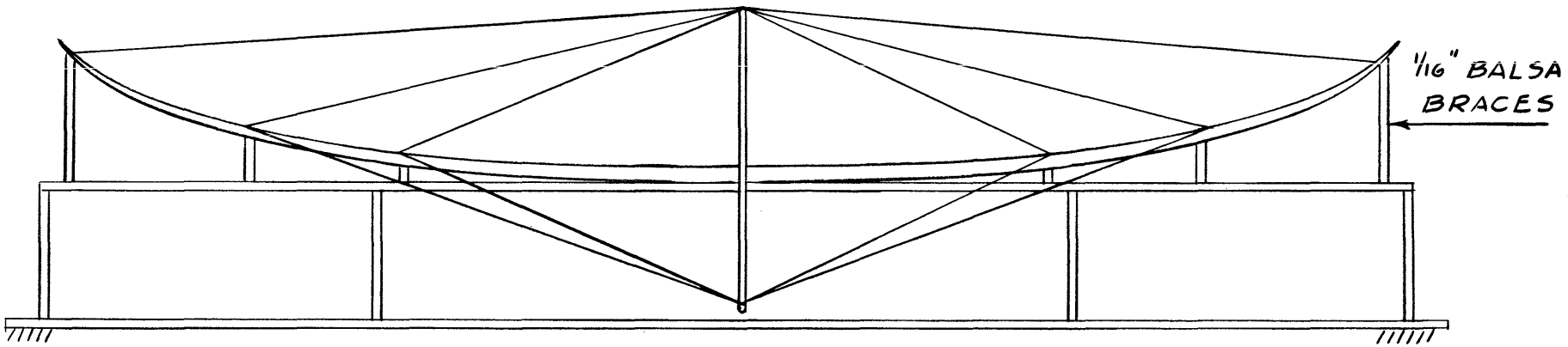
As an aside to the above, condenser paper is named from its primary use: as dielectric material in condensers (commonly called capacitors now) which are electronic and electrical components used in radio, TV and other electronic equipment. This sample of condenser paper as furnished by Bill is almost white in color and weighs the same as standard condenser paper used today.

SCRIBE OUTLINE OF WING FROM TEMPLATE

10" ALUM. SIDING ≈ 40" LONG
EITHER CUT OFF OR FOLD OVER UPPER EDGE



LEAVE LOWER EDGE TO AID IN STIFFENING BOARD.
HANG EDGE OVER SIDE OF TABLE.
THIS SYSTEM WILL PRODUCE ACCURATE, DISTORTION-FREE OUTLINES.
TO TRIM, USE A 1/16" WIRE GROUND TO A NEEDLE POINT HEATED BY GAS FLAME, NOT A CANDLE.

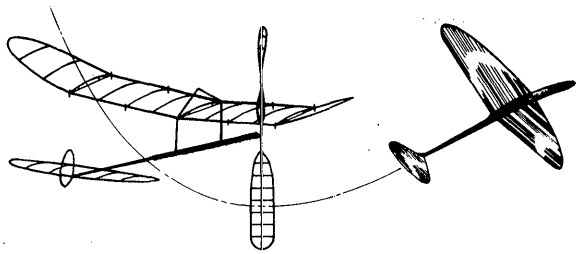


RIGGING FRAME MADE FROM 1/4" PLYWOOD.
EDGES SHOULD BE VERY SMOOTH.

G.B.
3-4-65

The Voice of N.I.M.A.S. MAR 1966

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

*RONALD GANSER, 2500 Mission St., Pittsburgh, Pa. 15203
JAMES JENNINGS, 128 Glenhurst Dr., Verona. Pa. 15147
RICHARD MEYER, 829 Indiana Rd., Verona, Pa. 15147
DON L. ORR, 320-D 73rd st., Newport News, Va. 23607
JOHN V. ORRELL, 6931st Security Gp.,Box 676, APO 09291, New York, New York
JOHN SCHEIMAN, 338 Ambler Court, Hampton, Va. 23369
RUSS SELEY, 3821 Paducah Dr., San Diego, Cal. 92117
*RICHARD WHITTEN, P. O. Box 176, Wall St. Station, New York, N. Y. 10005
*New members under Family Membership Plan

Tape Correspondence?

A couple of months ago I announced that I had a tape recorder and would welcome tape correspondence. I didn't say what speeds - my machine handles 1 7/8 ips and 3 3/4 ips tapes, even though I jury-rigged it to run one at 7 1/2 ips!

Spread The Word!

In recent months many NIMAS members have worked hard to spread the word about indoor models, both by recruiting new members and by public demonstrations. Special membership drives have been made by the Hampton Brainbusters (Va.), The Flying Bucks (Pa.), The Grumman Engineering Model Society (N. Y.), The Thermaleers (St. Louis), The D. C. Maxecutors (Wash., D.C.) and the San Diego Orbiteers. Also, Ron Ganser and the other indoor fliers in Pittsburgh, Pa., are organizing an all-indoor club. We all owe these fellows a vote of thanks for their efforts in our behalf. Even though those particular areas will benefit the most, we all benefit because of the increased activity.

Volunteer Contributions

In recent months the mail has been heavy, as is usual for the winter months. Since the correspondence is the life-blood of INAV, this leads to an accumulation of good material for future issues. On the other hand, it leads to slow answers to the letters; please don't get discouraged at the delay. In addition to the contributions of material, many NIMAS members are volunteering cash in addition to their dues, or concrete help with certain of the time-consuming details associated with the NIMAS and INAV operations. For example, some of the recent issues were built around a back page which had been pasted up and printed - representing both a cash donation and a donation of time. Of course, all the plans have been a time-and-skill donation of various volunteers; this is a necessary and appreciated contribution which greatly improves INAV. Thank you, all you who have been making these contributions. If anyone else wishes to help out, drop a line and let me know where your skills lie.

Indoor Films

About two years ago Joe Poloso took some movies of indoor flying at Lakehurst and donated a copy of the film to NIMAS. It is still unedited (one of the little tasks that never seem to get done around here), but many of those who have seen the film have high praise for Joe's work. This film is available to any club or group who wish to see it; the only charge is to re-imburse NIMAS for the postage involved.

NIMAS Awards

As a reminder to those who may not have seen earlier discussions of NIMAS Awards, these special awards are made to NIMAS members when they make flights exceeding the following times:

Indoor Stick (Any class indoor model; single flight)

AWARD	Cat. I	Cat. II	Cat. III
Silver	10:00	20:00	28:00
Gold	12:30	25:00	35:00
Diamond	15:00	30:00	42:00

Indoor HLG (Best single flight of nine)

AWARD	Cat. I	Cat. II	Cat. III
Silver	0:24	0:45	0:55
Gold	0:30	0:55	1:05
Diamond	0:36	1:05	1:15

New Award Winner

Silver Cat. I Rubber Award - 10:19.4, Chuck Wiechard

FAI INDOOR REPORT

Joe Bilgri received (and relayed) word that Hungary would hold the 1966 World Champs; he promised more info as he receives it. Presumably the details announced in the Dec. '65 INAV are accurate; if any further word is received before publication time it will be tucked away in this issue near the back.

POSTAL CONTESTS!

NIMAS Easy B Postal Meet

Have you made your entry in the NIMAS Easy B Postal meet yet? It must be postmarked no later than March 31, 1966. The rules are:

1. Wing span - 18" max.; chord 3" max.; paper covered, prop blades all balsa, solid stick and boom, no bracing.
2. Use AMA flight rules covering indoor stick, flights must be made at one session only and timed by an AMA member, preferably a CD. Entry fee 15¢, stamps preferred. Special event for Juniors; all other ages combined. Record the measured height of your site; all flights will be corrected (fudge factor) to the highest ceiling height.
3. Send entry (signed by timer) to: Bob Putman, 507 Darlene, Arlington, Texas

HLG Fudge Factor

As mentioned in the Dec. '65 INAV, it is not really fair to use the standard fudge factor for HLG postal contests if the ratio of ceiling heights is greater than 1.5; the advantage lies with the lower ceiling site. Jim Richmond suggests that a graphical presentation of winning times vs. ceiling height be made to construct a curve for fudge factor correction of HLG times. This is an excellent idea; if someone at each site will compile an average winning time for their site, maybe this graph can be constructed.

Postal Contest Results

Kokomo Aero Team (44') vs. Dallas (42') HLG & Easy B
Fudge Factors: Even-up by agreement.

Easy B	
Jim Richmond (Kokomo)	10:47.0
Randy Richmond (Kokomo)	9:21.6
Bud Tenny (Dallas)	6:07.0
Bob Putman (Dallas)	5:38.0

HLG (Two Flight Total)	
Jim Richmond (Kokomo)	1:10.5
Chuck Borneman (Kokomo)	1:09.5
Bud Tenny (Dallas)	1:06.0
Nickey Jones (Dallas)	1:04.9

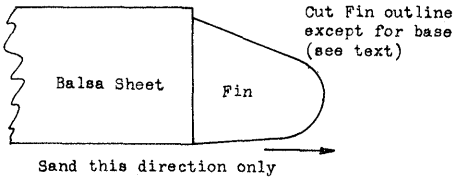
HINTS AND KINKS

Colored Microfilm

Ron Ganser won the scale meet in Cleveland recently with a microfilm covered Curtis Robin; the model was the center of attraction due to uniquely colored microfilm. The method of coloring was to lightly spray enamel on the film before covering with it. He used heavy film (apple green); the enamel used Soya Alkyd and aromatic hydrocarbons as vehicles and Dichlorodifluoromethane as propellant. He sprayed from 18" distance and recommends that the particular enamel you select be tried before starting work on the model.

Sanding Hint

Most IHLG parts are easy to sand properly, but those fins get pretty small and hard to hold. Cut the outline except for the bottom of the fin (see sketch below) and, leaving the fin attached to the blasa sheet, complete the sanding by holding onto the sheet. Finally, cut the fin loose and touch up the bottom and glue it on. Remember to use a sanding block and and sand away from the anchor point - if you pull back, you may crumple it!



RECORDS? MAYBE!

CAT. I RECORD TRIALS, Wilmington Rec. Center, 29' 11"
Los Angeles, Calif., Feb. 11, 1966
Open HLG - 1:11.5, Ron Wittman

NEWS FROM AROUND THE WORLD

CALIFORNIA - WILMINGTON

The Feb. Wilhall record trials was a field day for HLG men, but local rubber fliers stayed away in droves. This was a real reward for the many hours of effort put into the meet by the CD and his help! The out-of-town rubber fliers actually outnumbered the local men. Many words of congratulations are due to Ron Wittman for his HLG time of 1:11.5 - not bad after a four-year layoff for military service! The March Wilhall meet (Mar. 11) is the 4th Annual Scale meet - a real bang-up affair each year.

COLORADO - DENVER

The Martin Model Masters wind up their indoor season with a meet at Aurora; the 33' Hinkley High School Gym is the site. For time and other details, contact Mike Des Jardins, 8314 E. Kenyon Dr., Denver, Colorado.

NEBRASKA - LINCOLN

The Third Annual Spring Indoor Contest by the Lincoln Sky Knights will be held March 27 at the Univ. Of Nebr. Fieldhouse (45'). Events: Paper Stick, HLG and Indoor Stick. For more details contact Joe Mock, 851 North 42nd, Lincoln, Nebraska.

NEW JERSEY - LAKEHURST

Russ Russo has obtained official approval for at least three dates in Lakehurst: Monday, May 2, 1966, Monday, May 30, 1966, and Sunday and Monday, July 3 & 4, 1966. Meets will be AMA sanctioned. Good attendance is necessary to demonstrate our interest; this may also get more dates. Contact C. V. Russo, 143 Willow Way, Clark, New Jersey. 07066 for more details.

MICHIGAN - DETROIT

March 11 is the date for a fun event by the Detroit Balsa Bugs; Lasky Recreation Center, 13200 Fencon in Detroit is the site. The event is Balloon Busting - sounds like a ball! For rules and details, contact Paul Crowley, 32604 Tecla Dr., Warren, Michigan 48093 Phone 294-0266

NEW YORK - SYOSSET

The Grumman Engineering Model Society sessions upcoming are scheduled for March 17 and April 7 at the 19' Harry B. Thompson Jr. High in Syosset. Contact Mr Jean Paillet (home phone 516 MA 6-2825) for details.

OKLAHOMA - TULSA

The Tulsa Glue Dobbers are holding an indoor contest on March 19 in a 20' site. They have had some practice sessions, but no details are available. Contact Bob Hanford, 3838 S. 88th E. Ave., Tulsa, Okla. 74145 for info - knowing the Glue Dobbers, they are sure to have Scale!

OREGON - ALBANY

Bob Stalick reports that the Willamette Modelers Club, Inc. holds an indoor meet in March each year with HLG, Scale and Paper Stick events. I lost the date, believe it to be March 11. Contact Bob at 2807 South Oak St, Albany, Ore. 97321 for details.

PENNSYLVANIA - PITTSBURGH

The Second Allegheny Indoor Air Meet is scheduled for April 24, 1966 with a practice session on April 23. This meet (scheduled for the Hunt Armory, 324 Emerson St., Pittsburgh) appears to be a rival for the Great Lakes Indoor Air Meet held in Cleveland yearly. Trophies and prizes thru 4 places for five age groups in HLG, Paper Stick, Indoor Stick and PreFab insures something for everyone; a special HLG event for youngsters rounds out the list. A futuristic "Originality and Performance" event is a new idea also. 32 pre-juniors will win a jet ride around the county and two scholarships to Bull Academy is a prize in the originality event. There is more, but get it from Ralph Pennetti, 3918 Brandon Rd., Pittsburgh, Pa. 15212. This meet looks to be a "must".

VIRGINIA - HAMPTON

The Brainbusters continue their monthly sessions in the 24+' Armstrong School Gym. They have been plagued by drift which greatly restricts time, so they have gone to scoring on two flight totals. This is an active group, with many good fliers. Get time and details from Harold Crane, 4002 Buchanan Dr., Hampton, Va. 23369.

WASHINGTON, D.C.

The Maxecutors have found an excellent site for their Cat. I meet scheduled for May 1, 1966. The site is the fieldhouse at Ft. Meade, Md.; the base officials are giving excellent cooperation and are demonstrating a very high interest in model aviation. The meet events are HLG, Easy B (Maxecutor rules, 3⅛" chord), Class B Stick (mike and paper combined) and Scale. Contact Tom Vallee, 9136 Edmonston Ct., Greenbelt, Md. 20770 for details.

STATE OF THE ART

This model of the month by Joe Hindes seems to thrive on poor conditions and keep coming back for more. It has three principle trophies to its credit: 1st, '65 Great Lakes Indoor Meet (12:38); 3rd, '65 Nats (21:01.2); and 1st, '66 Great Lakes Meet (14:11). In each of these contests the conditions were rather poor; it is significant that the model retained its cruise in turbulent air even though the CG is quite far back. Joe admits to having quite a bit of luck in missing obstructions this year at the Great Lakes meet; rubber supply problems left him with sizes too small and too large. He finally settled on the oversize rubber and added a monowire brace to the fuselage to prevent the stick from bowing. The brace is not necessary with the proper rubber, so it is not on the plans. Note that both the wing and stab are offset on this model - this leads to tight turn capabilities which help considerably in combatting drift. During the winning Great Lakes flight the heavy rubber put him right at the top where a tight turn was necessary. During the flight the drift pattern took the model almost to both ends of the hall; a real ulcer maker!

THE LAB

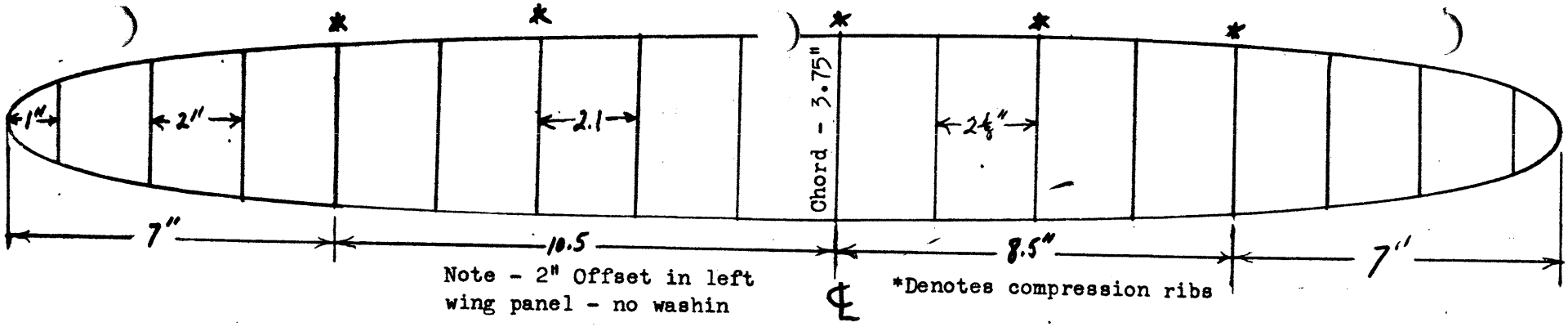
Preliminary Rubber Report

Hal Blubaugh has devoted a considerable amount of time and energy developing rubber test mechanisms and has accumulated quite a bit of test information. The following information is presented as a preliminary report, and some future issue will present a report on the test gear and supporting test results:

1. There is no difference in storable energy per unit weight of rubber. That is, varying the loop length and cross-section does not change the maximum energy the rubber can store, but it is possible to store near maximum energy more consistently in smaller cross-section loops without breaking.

2. Several strands of small cross-section will develop more torque while accepting less turns than the same weight and length of rubber in a single loop, so the unwinding time is less for a given prop.

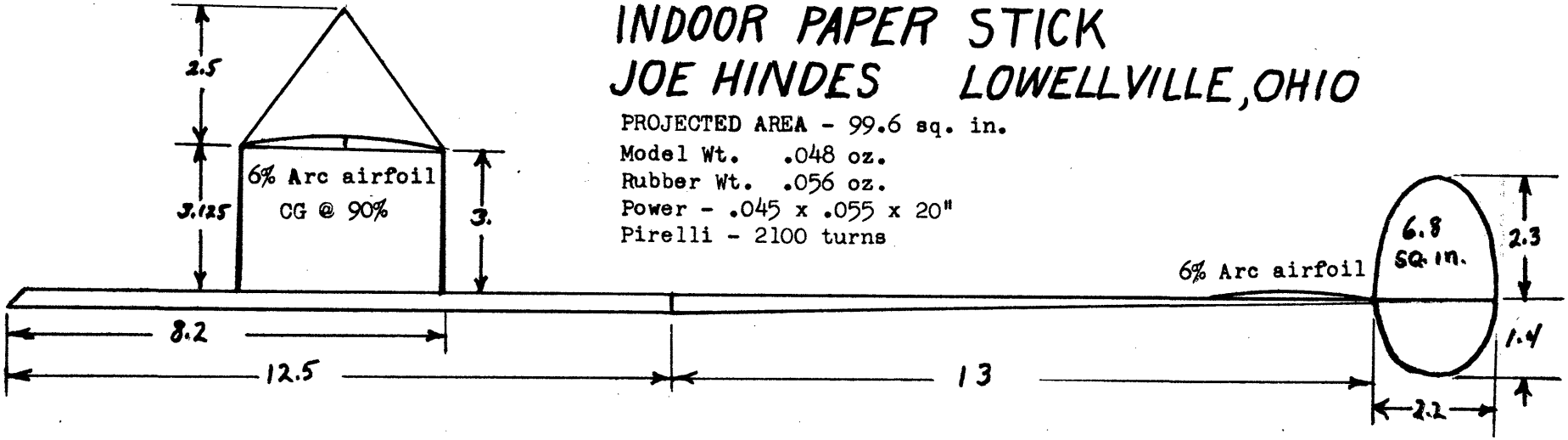
3. SIG Powerstrip is almost as good as good Pirelli (within 5%) on energy storage, but the torque at a given number of turns is less. That is, it delivers its power over a longer period of time than Pirelli.

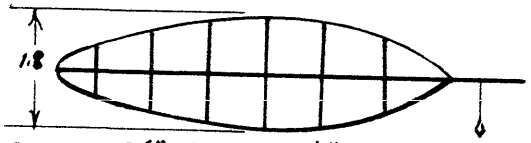


INDOOR PAPER STICK

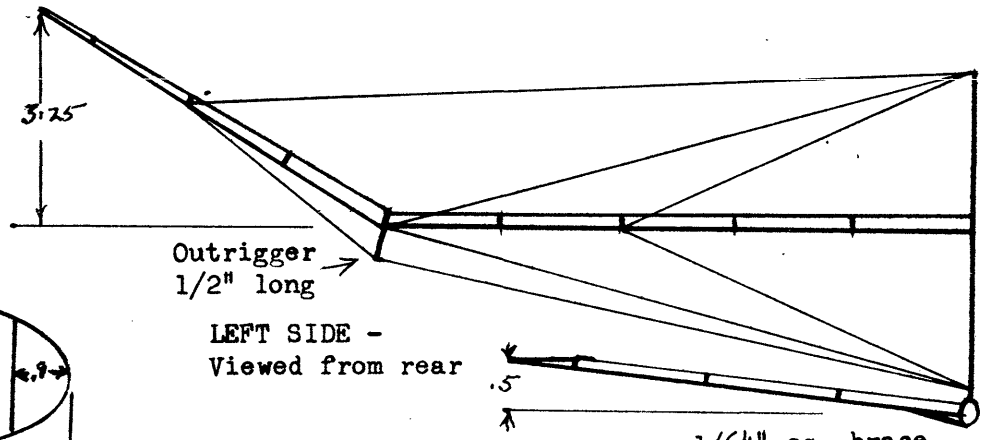
JOE HINDES LOWELLVILLE, OHIO

PROJECTED AREA - 99.6 sq. in.
Model Wt. .048 oz.
Rubber Wt. .056 oz.
Power - .045 x .055 x 20"
Pirelli - 2100 turns

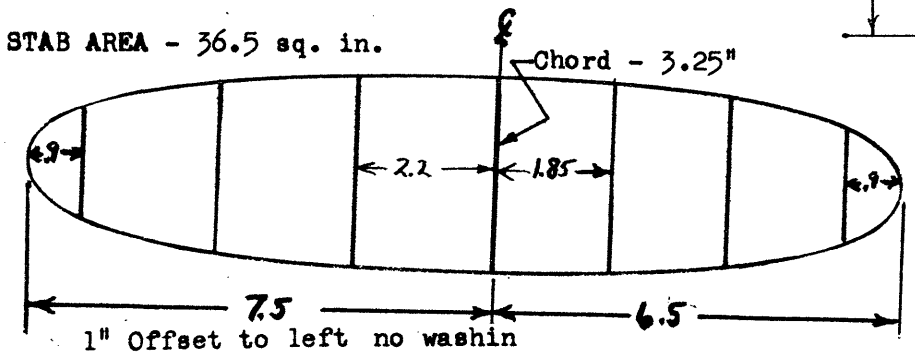




Prop - 16" dia. x 24" pitch



STAB AREA - 36.5 sq. in.



MICROFILM TECHNIQUES

Two Covering Methods

When modern, highly stable microfilm is stored in air-tight boxes, the resulting sheet of film is either quite tight on the hoop or only slightly slack - not slack enough to cover with. Thus, to properly cover with this film it must be made slack enough to curve around a wing or stab without distorting the framework. Both these methods presented below are tried and proven; one may be easier for you than the other, so try them both.

Kopecky's Method

The wing outline is drawn on 1/8" plywood, and then the plywood is cut out leaving a 1/16" margin outside the line. It is sanded smooth, waterproofed with shellac or lacquer, and sanded again. The wing is built on this semi-form, then returned to the form for covering. The ends of the form are raised (Fig. I) so the tops of the ribs are level with each other. The wing outline is wet with tap water, using a soft brush. The hoop is supported above the wing so the film just touches the ribs without crushing them down. 1/4" x 3/8" balsa strips slightly longer than the wing are laid on the film just outside the wing outline; the film is then cut loose from the ends of the hoop and then outside the balsa strips. As the film outside the strips is cut loose, the weight of the strips lowers the film over the rest of the wing smoothly and without stresses. The film also laps over the spars for better adhesion. See Fig. II for the top view of wing and hoop prior to cutting the film loose; the numbered broken lines show the order and direction of the cuts.

Modified Hainer Method

The Jan. '64 INAV had a new microfilm hoop design by Phil Hainer which makes it much easier to cover curved parts with microfilm. The ends of the hoop were soft aluminum which is bent to the airfoil shape of the wing; thus creating a trough of film to lay the wing into for covering. Not only is the wing accessible so the outline and ribs can be wet down at your leisure, but the film is smooth and stress-free and laps over the spars as with the Kopecky method.

Figure III shows my basic modifications to the Hainer hoop. First, the long sides of the hoop are made from rectangular pieces (1/8" x 1/2" for small stab-size hoops; 1/4" x 1" for full size wing hoops) so the hoop will support itself during the covering operation and still not let the film sag too low. The ends are made from thin springy metal (saw blades, spring steel, or other similar materials) and the curve is pulled into the ends with a tight string. The latest model has removable cranks which wind up the string as shown in Figure IV.

The end pieces are assembled to the side pieces with epoxy glue, along with the four pieces of tubing which hold the "plug-in" crank and pin assembly. Figure IV shows an end view with the cranks in place; as you turn the crank it winds up the string and bows (dotted line) the end of the hoop.

The covering sequence is thus: Remove the crank and pin assemblies and coat the top surfaces of the hoop with rubber cement. Invert the storage hoop (covering hoops should be slightly smaller than storage hoops, so they fit inside and leave a small gap around the covering hoop for trimming) over the covering hoop and let the film adhere. Trim the film loose and remove the storage hoop. Install the crank/pin assemblies and slowly bow the hoop (tighten the two ends as evenly as possible) until the curve approximates the wing airfoil. Invert the wing and place it in the trough of film. Using a very fine brush, start wetting the outline at the center compression ribs and work evenly out toward the tips. Also, wet the ribs as you work toward the tip. Let the framework dry for an hour or more and then invert the hoop and trim the wing loose from the frame. From here on out - bracing and final assembly is up to you!

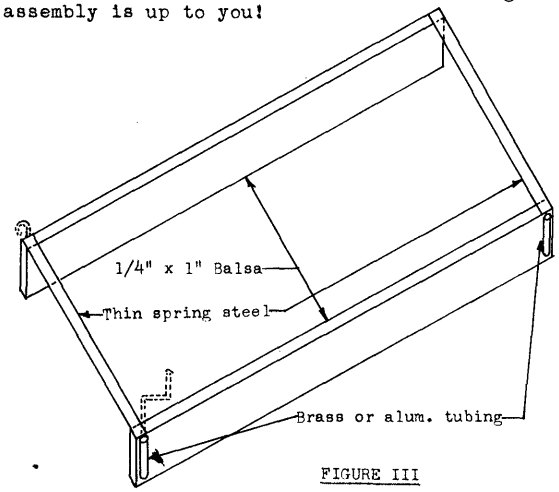


FIGURE III

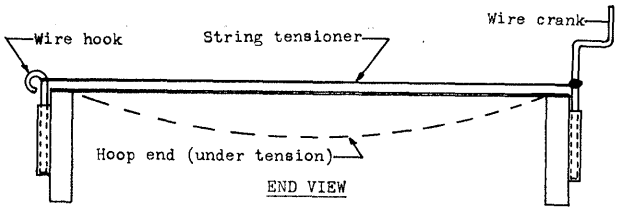


FIGURE IV

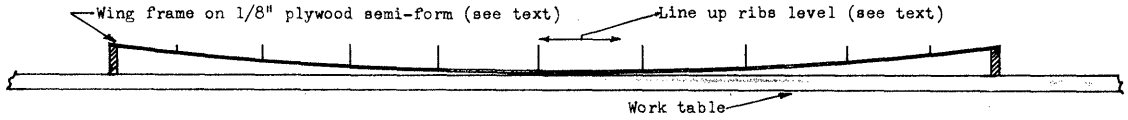


FIGURE I

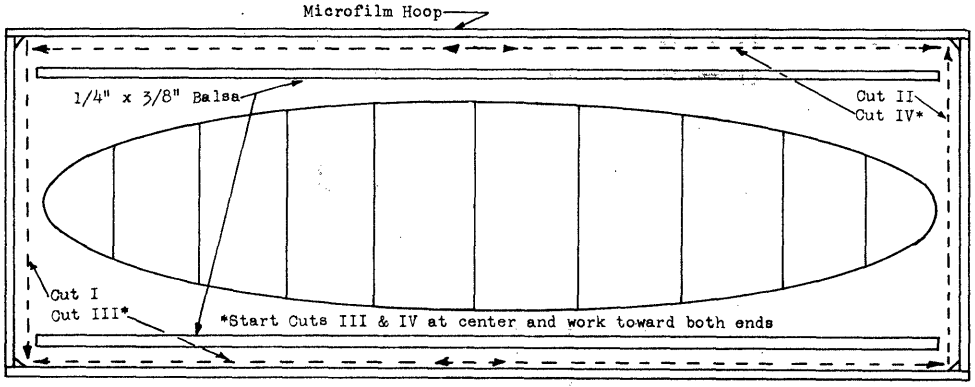
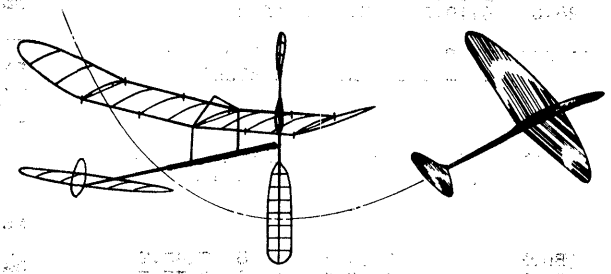


FIGURE II

The Voice of N.I.M.A.S. APR·1966

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

DONALD BAL, 320 Shadyside Rd., Ramsey, New Jersey
DAVID ERBACH, 2979 Dudley, Lincoln, Nebraska 68503
ROBERT LEISHMAN, 167 Goldenridge Dr., Levittown, Pa.
RICHARD LEISHMAN (Family 19054
IAN W. LEISHMAN Memberships)

Loof Lirpa Strikes Again

3.14159 Pi Street
Dear Bud; Squaresville, Calif.

Just to keep you up to date on my most recent researches, I thought I'd drop you a line (also hook and sinker).

First off, let's give the scale boys a shot in the head by giving them jet power! Any drug store will sell you small gelatin capsules to be made into pills by filling them with medicine. (They are, by the way, excellent containers for storing washers, jewel bearings, rubber lube, etc.). What you do is puncture one end with a pin, put a lump of dry ice inside, and seal it shut with scotch tape - Instant Rocket Power! A mike scale B-52?

Second, I would like to suggest indoor thermal soaring with mike gliders. Nothing new? But I plan to carry my own thermal! The plan is to build a small wire hangar under the nose of the glider and put a small D-T fuse on it. The lit fuse heats the air, which then rises and causes the plane to lift. No laws of Physics are violated since the burning is an expenditure of energy. All we have is a Dynamic Soaring Hot Air Balloon. Note! Don't set your hall on fire, they may not let you fly there again!

Third comes another for our scale friends. You want to build a scale WW2 ship, right? You want a really shiny painted finish, right? Aha! Pour some red-green microfilm and let it cure. When it is aged, spray it with two light coats of enamel. The weight of the finished material is the same as raw condenser paper; it is quite strong and can be cut out and handled. Be sure to use enamel which does not contain solvents that dissolve lacquer.

Rots of Ruck,

Loof Lirpa

1966 Nats Info

The last word (April 10, 1966) was that a site for the Indoor Nats had not been picked; it seems likely that the Madison Street Armory will again be used. Hopefully, the decision will be made in time for the May issue.

The March '66 Model Aviation had a report on streamlining the '66 Nats, explaining why Indoor was moved to Tuesday, July 26 (no flying on Monday at all) and why several events were dropped or combined. To those who would cry "Foul," stop to think! If the Nats were cut to three days, it would still be a model extravaganza without equal. We still have over 30 events and 5½ days of flying and all the meetings and trappings associated with the Nats. We lost two events, had four combined into two events and got a slightly more crowded schedule. We then gained the goodwill and approval of the U. S. Navy, our host since the 1948 Olathe Nats. To really appreciate the Navy effort in our behalf, you must attend a Nats Planning session as I did in 1962. I was appalled at the extremely large behind-the-scenes effort (100% Navy) required for a successful Nats. Since then, I have been even more thankful for the Navy sponsorship of the Nats. It would take over $150,000 each year to replace the manpower and facilities the Navy donates to run each Nats. To those who would say "Make the best of a bad situation" I would say "We have the best of a very good situation."

National Free Flight Society

The National Free Flight Society passed through a brief time while certain basic policies and plans were being formulated. Now, NFFS is open for business with a slate of competent officers and plans that will help free flight overcome its present slump and become a vigorous modeling movement again.

The NFFS Executive Council is made up of Dick Black, Pete Sotich, George Murphy and Carl Fries. The Senior Advisor is John Worth, Bob Stalick is the National Executive Secretary and Hardy Brodersen is the National Treasurer. With a slate of officers of that caliber, it's believable that the goal of 1000 members by the end of 1966 may be reached. The NFFS newsletter will be called FreeFlight, and should be published in mid-May by Editors George and Dorothy Murphy. Regular membership in NFFS is $4.50 for non-AMA members and $3.50 for AMA members; with Charter Memberships available until June 1, 1966 for $5 per member. Make checks payable to National Free Flight Society, include mailing label from Model Aviation (for proof of AMA membership) and send it all to Hardy Brodersen, 4729 Walnut Lake Rd., Birmingham, Mich. 48010. NOW!

NIMAS Awards

Gold Cat. III HLG Award - 1:05.6, Donald Bal*

*Don set this mark at the 1965 Nats. Any other NIMAS members who placed at the Nats can still claim their award by applying for it. It is not necessary to have the CD's signature or the signature of witnesses, since the Nats results are a matter of public record.

FAI INDOOR REPORT

World Champs Details

The 1966 Indoor World Championship will be held in Debrecen, Hungary, on July 14 to July 18 by the Central Aeroclub of Hungary. The site will be the assembly hall of the Kossuth University, which has a ceiling height of 29 meters and floor area measuring 28 meters by 25 meters. The Central Aeroclub is making arrangements for housing for teams and a limited number of journalists and spectators at a rate of $45 for the four day meet. Make inquiries to: Central Aeroclub of PRH, Budapest IV, Gorkij fasor 6, Hungary.

POSTAL CONTESTS!

NIMAS Easy B Postal Meet

Three Juniors and thirteen open fliers entered the NIMAS postal meet; the top three winners will receive a NIMAS Certificate as soon as they are prepared. The chart below summarizes the results with the times corrected to the highest ceiling via the standard fudge factor.

Entrant	Ceiling	Time	Fudge	Score	Place
Randy Richmond	44.5'	8:28.1	1.0	8:28.1	1st Jr.
Danny Diven	30.0'	3:45.0	1.22	4:13.2	2nd Jr.
Ken Fitch, Jr.	19.0'	2:33.5	1.53	3:55.1	3rd Jr.
Al Rohrbaugh	44.5'	11:53.4	1.0	11:53.4	1st Open
Clarence Mather	30.0'	8:38.0	1.22	10:33.0	2nd Open
Chuck Wiechard	16.0'	6:02.5	1.66	10:02.4	3rd Open
Don Sloan	30.0'	7:56.0	1.22	9:42.0	*
Fudo Takagi	30.0'	7:56.0	1.22	9:42.0	*
Carl Fries	21.0'	6:28.0	1.46	9:25.2	
Bob Leishman	16.0'	5:30.3	1.66	9:07.2	
Jim Richmond	44.5'	8:57.5	1.0	8:57.5	
Jim Pulley	44.5'	8:52.5	1.0	8:52.5	
Bud Tenny	26.0'	6:44.8	1.31	8:52.0	
Wayne Zink	44.5'	7:32.0	1.0	7:32.0	

Bob Putman	26.0'	5:38.0	1.31	7:24.0
Jerry Murphy	26.0'	5:10.0	1.31	6:46.8

*Don and Fudo tied for 4th Place; they can argue it out for themselves, since they are in the same club!

Other Postal Meets

Flying Bucks (Levittown, Pa., 16') vs. Grumman Engineering Society (Syosset, N.Y., 19') Fudge - 1.18 HLG, 1.08 Rubber.

Junior HLG			
Ian Leishman	(Bucks)	0:34.1 x 1.18	0:40.2
Chick Wiechard	(Bucks)	0:32.0 x 1.18	0:37.7
Mark Kerr	(Bucks)	0:28.0 x 1.18	0:33.0
Art McCrum	(Gems)		0:30.5
Greg Wiechard	(Bucks)	0:25.3 x 1.18	0:29.8
Ken Fitch, Jr.	(Gems)		0:21.1
Barry Paillet	(Gems)		0:17.7
Junior B Stick			
Chick Wiechard	(Bucks)	7:11.4 x 1.08	8:16.5
Ian Leishman	(Bucks)	3:08.7 x 1.08	3:38.4
Ken Fitch, Jr.	(Gems)		3:09.1
Chris Myers	(Gems)		2:03.0
Open HLG			
Chuck Wiechard	(Bucks)	0:38.5 x 1.18	0:45.4
Karl Birkel	(Gems)		0:40.2
Bob Leishman	(Bucks)	0:33.9 x 1.18	0:40.0
Max Chernoff	(Gems)		0:39.5
Jack Lane	(Bucks)	0:32.1 x 1.18	0:37.8
Henry Prew	(Gems)		0:33.0
Ken Fitch	(Gems)		0:29.9
Open B Stick			
Chuck Wiechard	(Bucks)	10:30.0 x 1.08	11:34.0
Bob Leishman	(Bucks)	7:39.7 x 1.08	8:27.0
Karl Birkel	(Gems)		7:06.6
Ken Fitch	(Gems)		5:15.0
Phil Kleisler	(Gems)		4:20.5
Ken Mosby	(Bucks)	3:47.0 x 1.08	4:08.6

Dallas Area (26') vs. Denver (33'w/beams 26')
Fudge - HLG 1.27; Rubber 1.0 (by agreement)

FAI Indoor			
Hal Blubaugh	(Denver)	10:27 + 12:43 =	23:10
Bud Tenny	(Dallas)	10:10 + 11:43 =	21:53
HLG			
Bud Tenny	(Dallas)	0:54.0 x 1.27	1:08.5
Eric Vogel	(Dallas)	0:46.2 x 1.27	0:58.6
(Someone didn't	(Denver)		0:42.5
send the names)	(Denver)		0:39.0
	(Denver)		0:38.6

NEWS FROM AROUND THE WORLD

ILLINOIS - CHICAGO

At long last an indoor site has turned up in Chicago. Bob Johnson, a pilot for United Air Lines and president of the Chicago Aeronuts, got permission for Saturday use of the T.W.A. hangar at Midway Airport. The hangar has a ceiling of 65' with floor area of 268' x 131'. For more info about the hangar, contact Pete or Charlie Sotich, 3851 W. 62nd Place, Chicago, Ill. 60629.

MARYLAND - BALTIMORE

The Baltimore Aero-Craftsmen are holding their Annual Indoor Meet at the Fifth Regiment Armory on Apr. 24, 1966. Events are Scale, HLG, Prefab and Rubber Challenge. HLG and Prefab are divided into Jr. and Sr-Open; the other events are all ages combined. The Rubber Challenge event is an excellent idea for all clubs faced with the problem of choosing which AMA class of rubber to hold. In this event, each entrant chooses one of a list of AMA rubber events to fly, and their time is converted to a percentage of the AMA Cat. I Open record for that class as published in the Nov. '65 Model Aviation. The highest score wins, of course - and the flier who has several models to fly has an agonizing choice to make! For more details, contact Bob Sifleet, 4412 Belview Ave., Baltimore. 21215.

MASSACHUSETTS - M. I. T.

The Tech Model Aircrafters will hold an indoor contest at the MIT Armory May 7, 1966 from Noon to 8:30 PM. Events will be Indoor Stick, Paper Stick and HLG for two age groups in each class. This ought to be a good meet, and the site is quite good as long as the weather is OK. Top time in the 45' building is 0:45 in HLG and 16:40 with a C Stick. For more details contact Ray Harlan, 118 Decatur St., Arlington, Mass. 02174.

NEW JERSEY - LAKEHURST

Thanks to the cooperation of the officials at Lakehurst NAS, at least three flying sessions will be held at Hangar #6, with more being arranged for. The sessions now scheduled are: Monday, May 2, 1966, Monday, May 30, 1966 and Sunday and Monday July 3 & 4, 1966. These will be sanctioned as AMA Record Trials and FAI Record Trials. If the attendance is good at these sessions, more will be scheduled for August and September with a big contest on Labor Day weekend.

NEW YORK - SYOSSET

The Grumman Engineering Model Society flying sessions have been moved to the second and fourth Thursday evenings each month, starting with April. This group may be on the trail of another site also; contact Max Chernoff, 5 Berkshire Rd., Great Neck, New York for details about the regular flying sessions.

PENNSYLVANIA - PITTSBURGH

An important and worthwhile indoor contest will be held April 24, 1966 at the Hunt Armory, 324 Emerson St. in Pittsburgh. This is the Second Allegheny Indoor Air Meet, organized along the lines of the Great Lakes Indoor Air Meet in Cleveland. Whether you fly indoor "for fun" or "for real", there is something for you. The events are Indoor Stick, Paper Stick, Prefab and HLG, with five age groups and a long list of prizes. This meet is well worth a long trip to attend, so get an entry blank and complete info from: Ralph Pennetti, 3918 Brandon Rd., Pittsburgh, Pa. 15212.

VIRGINIA - HAMPTON

Harold Crane and Hewitt Phillips located a site with larger floor area and lower ceiling than the Armstrong School gym, and found that there was much lower drift at the new site. As a result, their times were moving on up around 10 minutes. Perhaps they will hold future sessions at the new site, but the April 15 session will be at the Armstrong School and Paper Stick models will be flown. Contact Harold Crane, 4002 Buchanan Dr., Hampton, Va. 23369 for details.

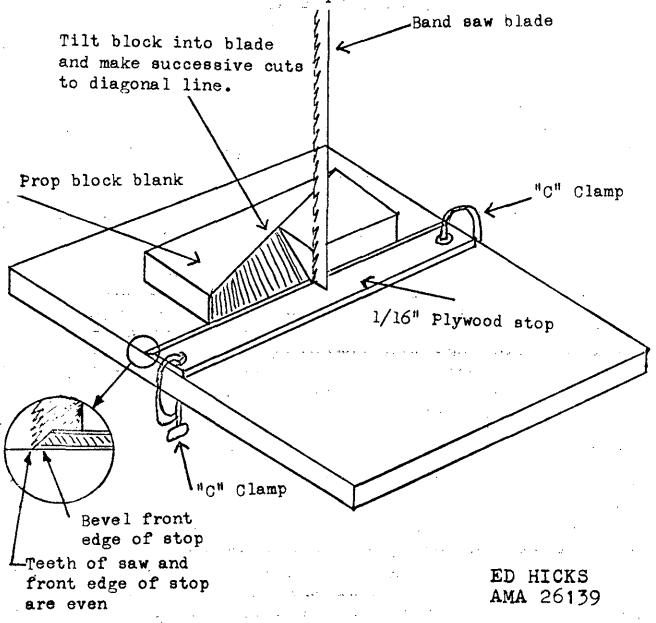
WASHINGTON, D.C.

The D. C. Maxecutors have measured the fieldhouse at Ft. Meade, Md., site of their May 1 indoor meet, and it has a 31' ceiling with 100' x 230' floor area. The meet will have Indoor Scale, HLG, Easy B (Maxecutor rules - 3⅛" max. wing chord) and Class B Stick (mike and paper combined). The club is very grateful for the excellent cooperation from the base officials and their contributions to indoor flying in the area. Contact Tom Vallee 9136 Edmonston Ct.. Greenbelt. Md. 20770 for details.

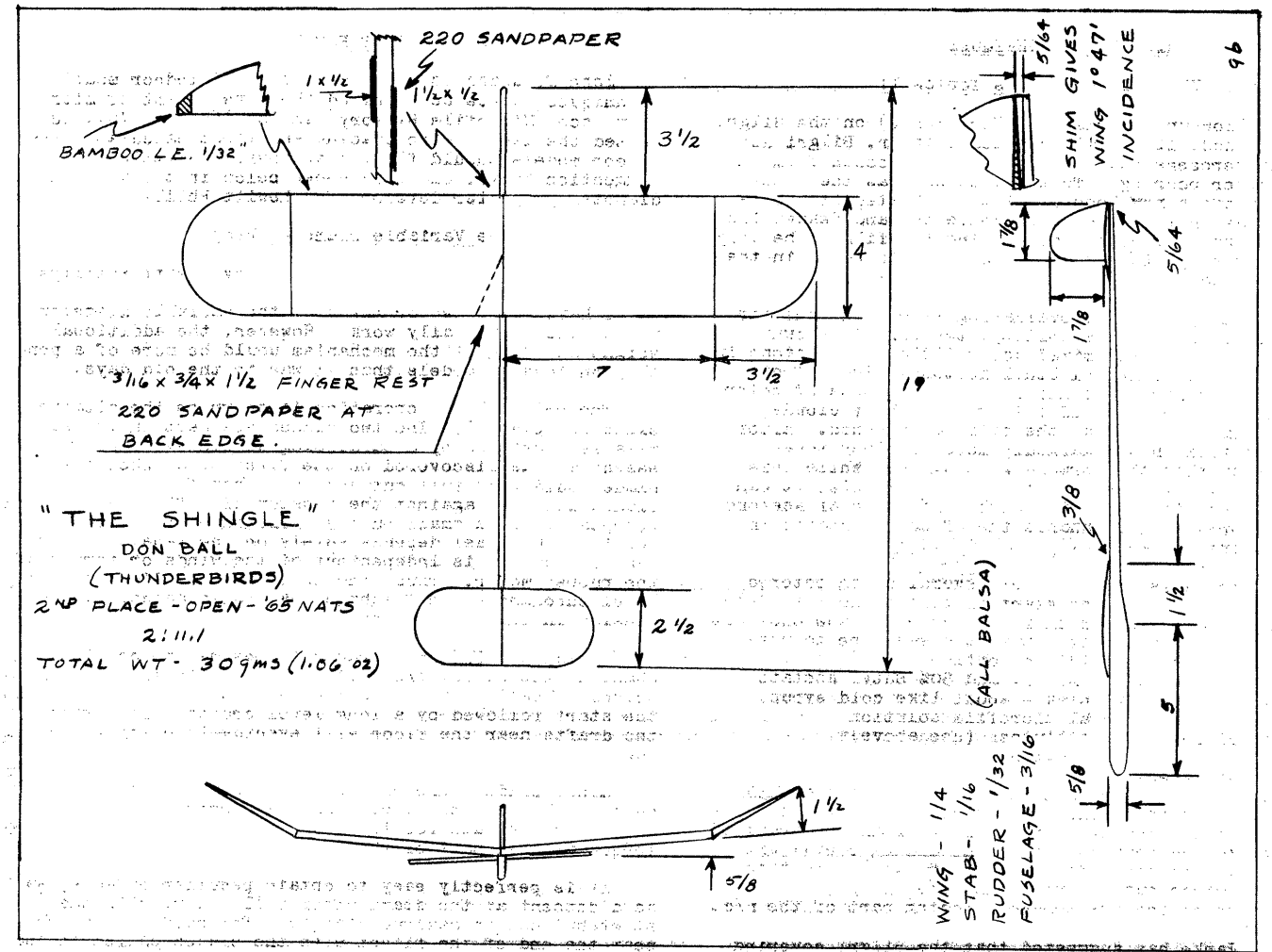
HINTS AND KINKS

Cutting Prop Blocks

Ed Hicks suggests that a band saw and a simple tapered plywood stop can ease the work of carving prop blocks. Refer to the sketch below - the block is located next to the stop and then tilted into the blade until the cut reaches the carving guide line (A) on the top of the block. A few quick cuts with a knife and then sanding is all it takes to finish up.



ED HICKS
AMA 26139



STATE OF THE ART

"The Shingle", our model of the month, won second in Open HLG at the '65 Indoor Nats. The times were 1:05.5 and 1:05.6, with the high time being made after a broken (girder bounce) wing was repaired. Don Bal says this about the glider:

A few weeks before the Nats I thought about glider designs, and came up with "The Shingle". The night before the contest I completed the glider; it was a matter of sink or swim the next day. Ironically the glider did not need any adjustments besides the addition of weight on the nose. Three throws and she was ready to go.

I would like to point out a few important details of the glider. 1. The turn is accomplished by stab tilt. 2. The wing has incidence of 1° 47' with respect to the stab. 3. The #220 sandpaper on both sides of the fuselage and finger rest assure a firm grip on the glider. 4. The bamboo on the leading edges of all surfaces prevents many nicks which would decrease the efficiency of the glider.

Most of my time preparing for the contest went to the 'arm'. My method of building up the arm is throwing rocks. I would start by throwing small rocks for awhile, then gradually increasing their size to the largest rock I could throw, then back to the small rocks again. The whole work-out may take 10-20 minutes. This method builds the exact muscles used in throwing a glider. It is not like push-ups and bench-presses which are general exercises to the throwing arm, but a concentrated exercise developing those special muscles used in throwing gliders.

A LOOK AT YESTERYEAR

Stout Trophy Follow-Up

In October Frank Ehling presented the original rules for the Stout Trophy now used for Indoor Stick (another Stout Trophy has been used for Indoor Cabin a long time) and asked when the event changed from a straight-line speed event to a duration event. The following info was presented by Carl Fries and Bill Barrett, and was taken from a rules sheet for the 1931 Nats, held at Dayton, Ohio by the A.L.M.A. At this Nats there was no indoor event because there was no suitable site, but the other events were Mulvihill, FF Scale, Wakefield and the Stout Oudtoor Fuselage Contest. The Stout rules were:

"Models to be eligible in this contest must 'conform to good engineering practice' -- that is, they must have built-up fuselages and resemble real airplanes; they must have main supporting surfaces (wings) of at least 125 square inches in area; wings must be double-surfaced; the fuselages must be completely covered, except for an opening of not more than two square inches to permit access to the motor; they may drop no parts in flight; they must be built entirely by their owners, except for propellers, wing ribs, propeller bearings and propeller shafts; they must derive their power from rubber motors, they must rise from the ground; they must be flown by their owners; they must have a maximum fuselage cross section at least equal in square inches to one-tenth of the length of the fuselage squared. A contestant may have three models for use in the contest. To be eligible for N. A. A. records, a model of 125-inch to 150-inch wing area must have wheels of at least 1½-inch in diameter; a model of more than 150-inch wing area must have wheels of at least 1 3/4 inch diameter."

SPREAD THE WORD!

During January and February the Kirkwood Thermaleers had a busy time promoting indoor. They started with an indoor meet for members of the club; five days later they had a practice session for a demonstration at the Affton, Mo., High School. Two weeks later an indoor scale meet was part of a demonstration for several Cub Scout packs at the Green Park Lutheran School. Finally, Dick Ganslen of the McDonnell club joined the Thermaleers for the big demonstration at the Affton High School. The occasion was the Scout Blue-Gold Banquet; after the Scout program the models competed with an FBI gun exhibit and an operating ham radio station and won hands down. The aftermath of the demonstration was overwhelming - both the Thermaleers and the local hobby shop had many requests for kits, information and help. This is the sort of thing we need! Say what you like about the Space Age and the glamor of rockets and space trips; indoor models are here-and-now and fun besides. We can boost indoor and all kinds of models with a few well-planned programs!

MICROFILM TECHNIQUES

Part VI - Miscellaneous Topics II

As a follow-up to comments (Feb. issue) on the Bilgri covering method, it should be noted that Mr. Bilgri used a portable kerosene heater to deaden and loosen film on the hoop after pouring. That is, as soon as the water had drained off a new hoop of film, he heated it over a heater to hasten the release of solvents and deaden the film. This had the effect of causing the film to be very slack on the hoop; this made it possible to cover in the manner outlined.

During the process of evaluating film solutions for static effect and final stability, the formula shown below was inadvertently mixed using 120 cc. of Acetone in place of 140 cc. of Methyl Ethyl Keytone. Two effects showed up immediately: control of the evenness of color was poorer and the finished film was slightly cloudy, giving the impression that the film had blushed. After ageing, the film showed markedly more tendency toward static effect than the formula with M.E.K. While this has not been verified by supporting experiments, it can probably be considered that a high percentage of Acetone in a film formula will enhance the effect of static in gold and silver films.

This formula is the first of several which entered a development stage at the start of this series; to date it has passed all tests with flying colors. The one test left is long-term stability, but it seems sure to pass this also. The nitrocellulose mentioned is 60 sec. viscosity, dissolved in 50% M.E.K. and 50% Butyl Acetate; this solution was very thick - about like cold syrup.

N/C 19A - experimental microfilm solution
55 cc. 60 sec. Nitrocellulose (see above)*
140 cc. Methyl Ethyl Keytone
4 cc. Amyl Acetate
21 cc. Randolph Non-tautening Butyrate Dope W-8350

*With very thick solutions like this, start with an empty measuring cup or graduated cylinder, pour in the required amount of N/C and pour this into the mixing container. Measure a part of the added solvent (M.E.K.) into this cylinder to rinse out the remaining N/C and pour this in with the rest of the mix to avoid losing part of the n/c.

Curtis Janke has suggested that the Bilgri covering method (see above and Feb. '66 INAV) works nicely on a cork work surface. The texture of the cork is such that microfilm which touches inside the wing outline has no tendency to stick, which sometimes happens with smooth surfaces. Wing alignment can be assured by marking the wing center on the ribs during construction, then aligning these marks with a line marked on the cork board.

Joe Hindes has experimented quite a bit with Dibutyl Phthalate as a plasticizer and confirms previous remarks (Dec.'65 INAV) that DBP makes microfilm tear-resistant. The film is improved two ways; thinner sheets can be lifted and puncture holes tend to resist further tearing and enlarging. On the other side, Joe says that DBP seems to inhibit solvent release. That is, the film will take longer to cure on the water and there is greater chance of losing the sheet due to shrink breakage. This can be partly overcome by fanning the sheet or agitating the air above it, starting about 30 seconds after the pour.

My own plasticizer experiments continue as time permits, along with experiments to control sticky film and reduce the static effect of very thin film. To date, no conclusive results are available except for films with Non-tautening butyrate; but Benzyl Butyl Phthalate and Tricresyl Phosphate will cause remarkably high static effect in thin films.

Finally, Joe Hindes suggests that better quality control on thin sheets can be achieved by noting the color of the film on the water and after drying off. He has observed that the film appears to be one shade darker on the water than on the hoop. That is, light straw color on the water is actually an ideal silver on the hoop. My own lighting conditions show less difference - almost exactly the same color before and after. It is likely that the location of the light with respect to the tank will be the important factor; for consistent results, use the same arrangement of tank and lighting each time.

RECORDS? MAYBE!

MARTIN MODEL MASTERS INDOOR CONTEST, March 20, 1966
Cat. I, Hinkley H. S. Gym, Aurora, Colorado (33')
Open FAI Indoor - 23:10, Hal Blubaugh

PROP FORUM

John P. Glass is truly a pioneer of indoor model techniques, since he inspired the development of microfilm (see "Microfilm History" in '64-'65 Zaic YB), suggested the use of wire bracing and first calculated that indoor models should fly for an hour. A little-known suggestion by Mr. Glass is shown below in the variable diameter propeller developed by Hewitt Phillips.

The Variable Diameter Prop

by Hewitt Phillips

I have built two or three of the variable diameter props, and they really work. However, the additional weight and drag of the mechanism would be more of a penalty on today's models than it was in the old days.

The principle of operation is shown on the attached sketches (page 5). The two blades are kept in the same relative position by a parallelogram linkage (absolutely essential, as discovered on the first trial when one blade would stay full out and the other full in). The blades wind out against the tension of a fine rubber band wrapped around a small pulley. The rate of climb or descent of the model depends solely on the tension in this rubber band and is indepentent of the winds or torque of the rubber motor. Thus, the model may be adjusted to fly level throughout the flight by carefully adjusting the tension in this fine rubber band.

Variations in the characteristics may be obtained by changing the pulley from circular to elliptical or cam-shaped. Usually, it is desirable to obtain some climb at the start followed by a long level cruise. Otherwise, the drafts near the floor will eventually bring the model down.

Also, blade angle change may be obtained simultaneously with diameter by canting the hinges. This may be used to compensate for twist of the blades under high torque at the start of the flight.

It is perfectly easy to obtain peculiar effects, such as a descent at the start under full power, with the prop stretched out to maximum diameter, followed by a climb near the end of the flight with the blades pulled in and the propeller buzzing around like a beginner's ROG. This condition obviously should be avoided for endurance.

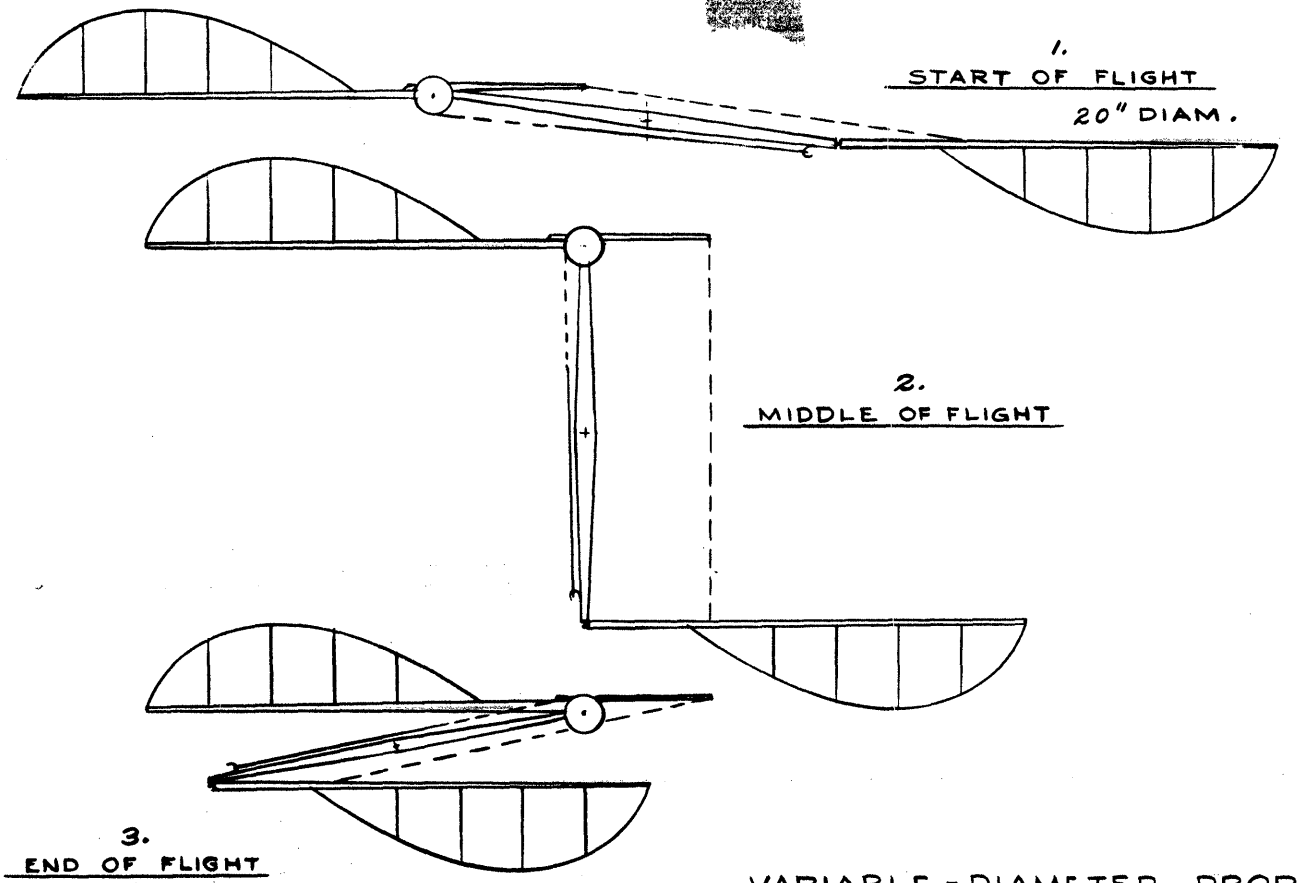
In Boston, we flew in the old Irvington Street Armory which had a 55' ceiling. The variable diameter prop was really advantageous under these conditions. I don't think it would compete with fixed diameter props in ceilings above about 80 feet.

THE LAB

Blubaugh Fence Follow-up

I have continued to test the Blubaugh fence on various gliders with interesting results. Plain Vanilla I (see Feb. '66 INAV) was modified by reducing the fence height from .090" to .075". As a result, the peak launch altitude possible increased to an estimated 22' for a maximum duration (very few tries) of 0:26. This configuration was then tried in the small site: a 20 flight series gave a high time of 0:22.5, a low of 0:18.8 and average of 0:21.2 for a 2% increase over the best performance previously. Plain Vanilla III (16" span, .135 oz.) has given 0:29.2 with about 1' of room left in our 26' site. P. V. IV (18" span, .25 oz.) was a total loss in a 42' site, giving the characteristic launch problems I have come to expect with fence gliders until they have been "lived with" for a while. P. V. III would barely fly the first session, but came through nicely later.

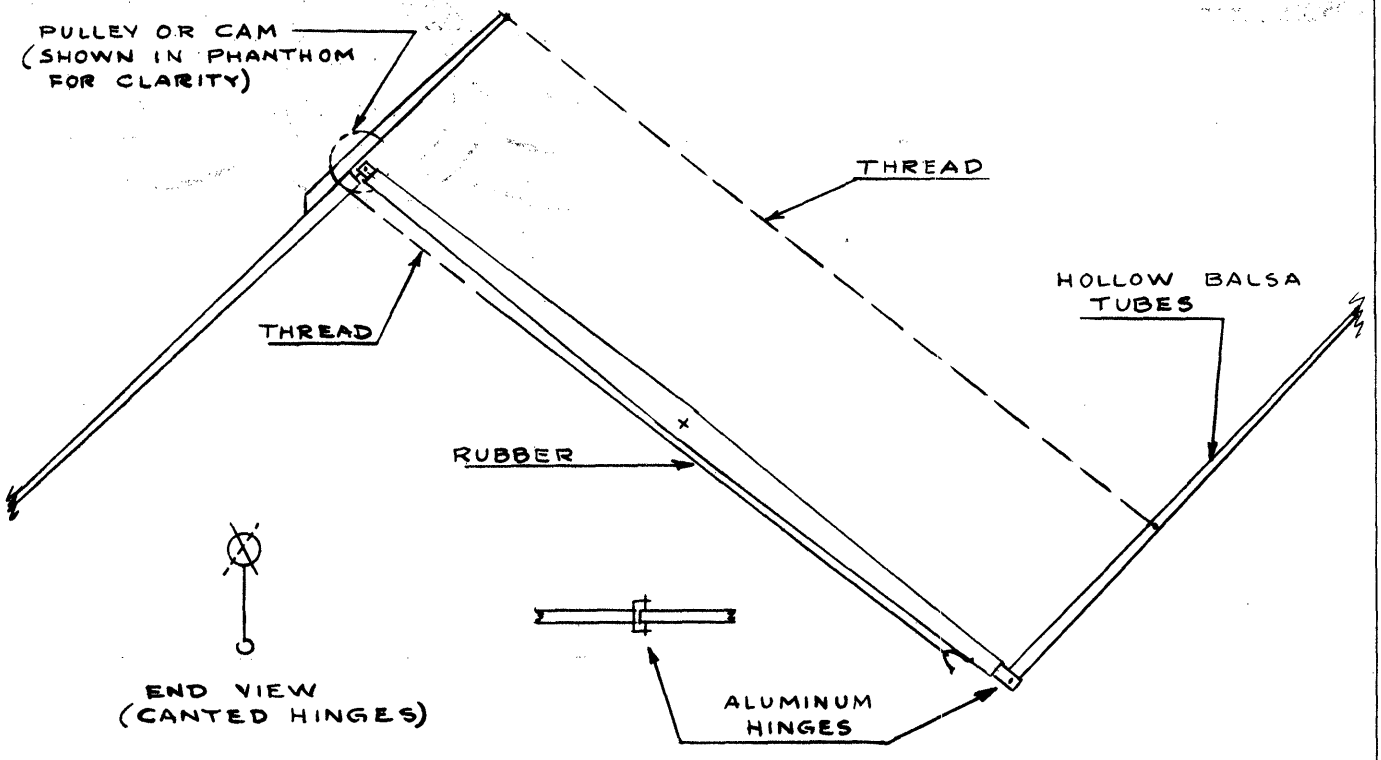
Eric Vogel's most recent glider gave some very good results with a fence; 0:23 from about 20' altitude consistently. The chief limitation of this glider was in the launch, and I believe a very flexible tail boom was the problem here. On my own gliders, those which were the least adaptable to operation with the fence were the gliders which had flexible tail booms. Thus, the Plain Vanilla series have been built with stiffer than usual tail booms, to very good advantage. However, the most interesting thing about Eric's glider was the airfoil. The section was essentially a streamlined flat plate with the fence attached. His glider had a tapered wing with 3" root chord; the fence tapered from .06" to nothing at the tip.



VARIABLE-DIAMETER PROP

—W. H. PHILLIPS—
HAMPTON-VA.

G.B.

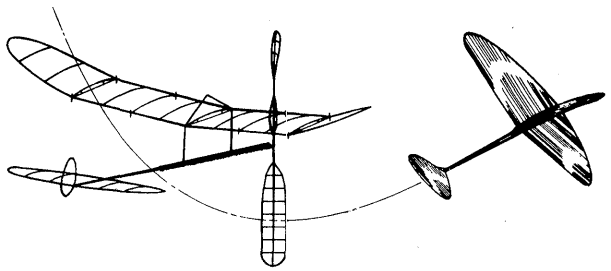


ENLARGED VIEW OF MECHANISM

GB

The Voice of N.I.M.A.S. MAY FEB ·1966

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

NOAH I. GOLDMAN, 55 Powell Ave., Bethpage, N. Y. 11714
*LOUIS VARGO, JR., P. O. Box 68, Escondido, Cal. 92026

MA/AM!

In a move to upgrade AMA membership and get a wider coverage of AMA doings, Model Aviation will be a part of the new American Modeler magazine starting with the July/ August issue. American Modeler has been bought out by Potomac Aviation Publications, Inc. and will be restored to the original concept as a model aircraft (only) publication, with emphasis given to helping youngsters in modeling. Bill Winter will remain as editor of Model Aviation, and will be editor of the new American Modeler magazine. Publication will continue bi-monthly until January 1966, when it will again become a monthly magazine. Good luck, Bill!

Nats Site Chosen

Pete Sotich, Nats Manager, has announced that the '66 Indoor Nats will be held in the International Amphitheatre at 43rd and Halsted Streets in Chicago. Those who flew at the '58 Nats will remember the site. The ceiling is 80', with floor area of 123' x 238'. Some fliers had difficulty with some obstructions in 1958, but Pete has already determined that the American Flag can be moved to the west end of the Arena and that the speaker cage can be raised to the ceiling. Some thought is being given to providing a test flying session for rubber ships at least, but there is no definite word on this yet. If a practice session will be held, future announcements will be made when the site and date is determined.

NIMAS Awards

Silver Cat. I Rubber Award - 12:05, Harold Crane

Gold Cat. I Rubber Award - 12:49, Hal Blubaugh

Gold Cat. III Rubber Award - 36:32, Pete Andrews*

Gold Cat. III HLG Award - 1:07.9, Ron Higgs**

*Pete made this flight at the FAI Finals on July 27, 1965
**Ron is the first NIMAS member from outside the U. S. to apply for a NIMAS Award. This one was a Nats flight, but flights made in Canada (Ron lives in Ontario, Canada) can be qualified. Honorary NIMAS members (those who live outside the continental limits of North America) can qualify for NIMAS Awards - write for details.

National Free Flight Society

NFFS membership is growing rapidly, and those who wish to be Charter Members must apply before June 1, 1966 or miss out. The following items come with membership:

1. A monthly newsmagazine devoted 100% to FF, with the first issue scheduled for late in May, 1966.
2. A full-size plans service.
3. A unified voice in AMA for all Free Flighters.
4. An agency to assist in developing small-field events in FF. (An editorial note: My personal opinion is that small-field events are a necessary part of the future of free flight, both from the standpoint of small sites being all many fliers have, and also that samll-field events will be more attractive to more fliers.)
5. An agency to promote FF Postal events.
6. An information service to promote Free Flight.
7. Membership Card and distinctive decals for all members. (The decals really work - I lost one on an A-1 last week!)

Regular memberships are $3.50 and Charter Memberships $5; Associate Membership (for non-AMA members) $4.50. Make checks payable to National Free Flight Society and send them (with mailing label from current Model Aviation as proof of AMA membership) to: Hardy Brodersen, National Treasurer NFFS, 4729 Walnut Lake Rd., Birmingham, Michigan 48010.

FAI INDOOR REPORT

Interim Report

The June issue should contain many final details of the 1966 Indoor World Champs, but here is a brief report just prior to the formal entry deadline (May 20, 1966):

Countries known to have entered are: Austria (one man team - Manfred Koller), United States - full team, and New Zealand (proxy entry by John Malkin) and Hungary.

Germany has picked a team and it is presumed that a formal entry has been made. Two Canadian fliers have requested permission to represent Canada. English indoor fliers are trying to organize an entry.

Tom Finch, the U. S. Team Manager, has had to resign for personal reasons, and selection of a replacement has not been concluded at this time.

POSTAL CHALLENGERS

Members of the Grumman Engineering Model Society, who came out slightly second-best in their postal tilt with the Flying Bucks (results in April '66 INAV) are spoiling for another postal contest. They have a Cat. I site (19') and are most interested in postal competition in B Paper Stick and HLG. Any takers? Contact Max Chernoff, 5 Berkshire Rd., Great Neck, New York.

RECORDS? MAYBE!

D. C. MAXECUTORS CAT. I CONTEST, May 1, 1966 31' ceiling
Cat. I, Ft. Meade, Md. Base Gym
Jr. D Stick - 7:28, Linda Randolph
Jr. FAI Indoor - 14:28, Linda Randolph
LINCOLN SKY KNIGHTS 3RD ANNUAL INDOOR CONTEST 3/27/66
Cat. II, Univ. Of Nebr. Fieldhouse 45' ceiling
Open Autogyro - 6:32.8, Walter Erbach

BIG CONTEST!

Due to the lateness of this issue and busy schedules here, this issue isn't proofread. The reader who finds the most mistakes will be sent a red-lead grading pencil!

QUESTIONS AND ANSWERS

35. This is sort of a multi-topic question, dealing with several aspects of pirelli rubber:

a. What is the best way to store pirelli?
b. Should it be washed before storage or only just prior to use?
c. What is the best way to break-in a new motor, and is break-in really necessary?
d. What is gained by preliminary break-in rather than flying it in?
e. Explain the different methods of winding a motor for different ceilings.
f. What care should be given a motor after use, and can used motors safely be stored to advantage?

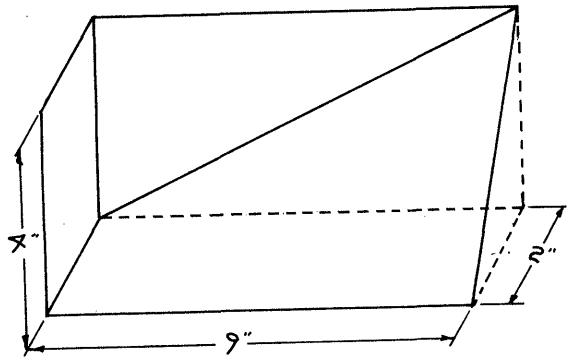
Really, the above questions just scratch the surface. What is really needed is a thorough discussion of the lore that has been generated by indoor modelers since we first started using pirelli. Who will help us out?

STATE OF THE ART

A few months after Frank Cummings won the '63 Nats with the record time of 27:38, Joe Bilgri took two models to Santa Ana for an all-out assult on the record. When the day ended, Joe held the record with 29:06.3, using the model shown on the plan page. When the model was new it weighed .037 as shown on the plans, but by the time it set the record the weight had climbed to .041. The model has lower aspect ratio than is normal for models of this size, and uses a very large prop for the wing span.

As a matter of special interest, Joe was the first to fly a cabin model for longer than 20 minutes, and he is still working to be the first to top 30 minutes. In fact, the record model was destroyed later that same day when the motor broke at the wrong time.

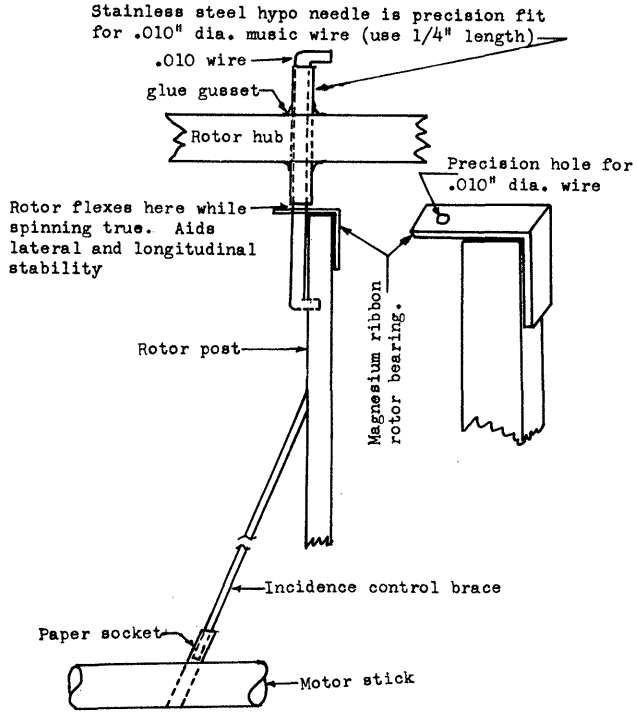
Details of the prop outline are on the plan page, and the prop block dimensions are given in the sketch below.



HINTS AND KINKS

Autogyro Rotor

John Triolo designed the rotor bearing shown below, and used it on his record autogyro flight at Lakehurst last fall. The items of special note are the incidence control brace which permits adjusting the rotor easily and the use of the hypodermic needle segment for a bearing which turns smoothly and yet gives consistent support to the rotor.



NEWS FROM AROUND THE WORLD

CANADA - MANITOBA

From the RCAF Station at Gypsumville ("the frozen North") comes the word that indoor activity in the Base Gym has been very good, with emphasis on HLG. An added fun-feature was a special HLG contest for a local cub scout group - good public relations and enjoyable too!

GERMANY

Manfred Koller (Austria) attended a contest for 35 cm. models in Nurnberg in April. The site was 14 meters high, with floor area 80 x 100 meters. The conditions were best around noon, when Hans Beck (member of the German FAI Indoor team) logged 9:01 and Manfred topped his own personal 35 cm record with 8:38. Girders which came down to the 11 meter height caught several models, but these were easily retrieved from a fire ladder which came with the building.

INDIANA - KOKOMO

The April indoor contest at Bunker Hill AFB was the last one until next fall, and the season closed on a note of very good performance. Al Rohrbaugh established the fabulous time of 12:00.2 in Easy B, which was the highest time in the site (maybe in the world) for paper covered Easy B with all-balsa prop. Wayne Zink, who only recently started building indoor, got 9:34.2. Ken Berry won scale with a Nesmith Cougar and 119 points.

NEBRASKA - LINCOLN

Low attendance and poor conditions marred the Lincoln Sky Knights 3rd Annual Indoor Contest. David Erbach won both Mike and Paper (Open) with 7:50.5 and 6:37.4; Joe Mock won Open HLG with 1:05.4 and Joe, Jr. won Jr. with 0:31.3, while Joe Mock, Jr. won Jr. Paper with 1:16.4.

NEW JERSEY - LAKEHURST

The East Coast Indoor Championship is all set for July 3-4, 1966 at Lakehurst. Classes are HLG, B Paper and Indoor Stick. HLG will be flown 9 AM to 1 PM each day, and Rubber until 9 PM each day. Contact Mike Granieri, 696 S. 18th St., Newark, N. J. for entry blank - late entry fee after June 25, 1966.

The May 2 session (reported by Hal Crane) produced top FAI time of 49:23 by Bob Champine, plus the following times: D Stick - 25:49, Russ Russo; B Stick - 24:32, John Triolo; C Cabin - 17:50, Bob Champine.

WASHINGTON D. C.

The Maxecutors' contest at Ft. Meade was quite well attended, and hotly contested. Bernie Schulman won Scale with 121 Points; Hewitt Phillips won B Stick (mike and paper combined) with 10:16 on a B Paper; Easy B was won by Reggie Batterson with 6:30.8 and Dan Belieff won HLG with 1:00.8.

A LOOK AT YESTERYEAR

Joe Bilgri passes on the following information about the origin of the Paper Stick event:

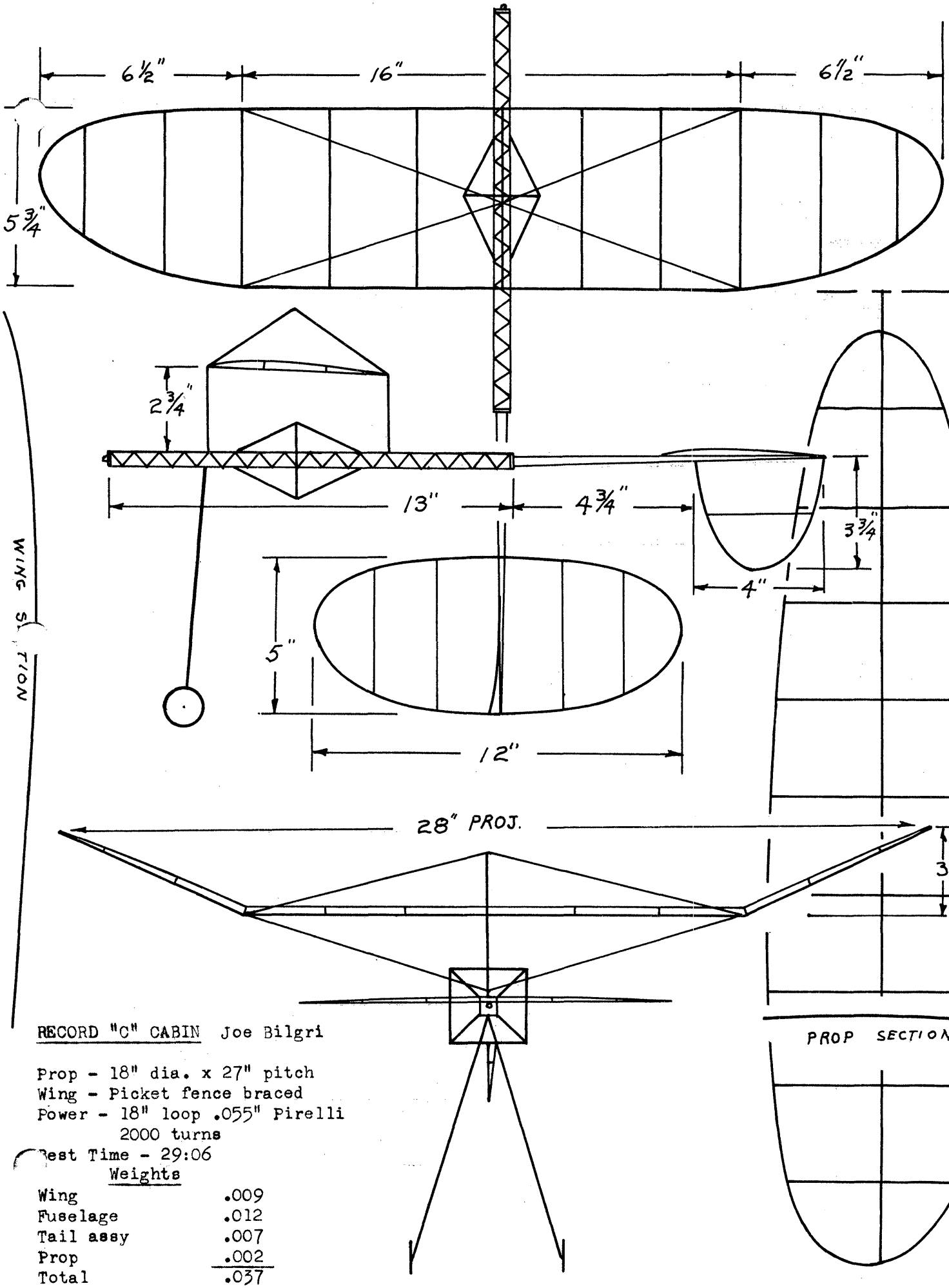
I don't know who actually made Paper Stick an AMA event, but it was flown at the 1955 Nats. The credit for making it an AMA event probably should be divided between Hal Roth (a member of the Oakland Cloud Dusters at the time) and Model Airplane News. If anyone else wants the credit, it's all right with me; most of my story concerns what was published in M. A. N. in 1954.

In the late 40's and early 50's our main club (Cloud Dusters) interests were Wakefield and Indoor. At that time Wakefield was the only international event and the trend was to lightly constructed models so more weight could be made up with rubber. Superfine tissue was hard to find in those days and everyone was looking for a light covering material. In the summer of 1952 on my way back from Sweden, I visited JASCO in New York. At the time, it seemed like a stroke of luck that some modeler had talked them into buying a supply of condenser paper so he could try it for Wakefield. I immediately purchased some for club members, but we soon found it was too weak for Wakefield.

With a big supply on hand, we started flying 100 sq. in. models as a club event. In the winter of 1952 and 1953 we were flying in a school auditorium and also in the Cow Palace which had a 100' ceiling. This brings us to Hal Roth, who flew in some club indoor contests even though he flew mostly outdoor events. Unknown to club members, Hal wrote an article "Should We Scrap Microfilm?" for the April '54 M.A.N. Needless to say, most of our club was furious, since indoor was one of our main interests.

More of the story is told in the M.A.N. At Work columns in June and July '54 M.A.N., where replies to the article were printed. I know that my feelings were so strong that it's a wonder the magazine ever mentioned my name again.

Prior to this article, I'm pretty sure that you can search for a movement toward paper covered indoor models without finding anything. However, paper covered models (covered with Jap Tissue and Superfine) were being flown in various parts of the U. S.



RECORD "C" CABIN Joe Bilgri

Prop - 18" dia. x 27" pitch
Wing - Picket fence braced
Power - 18" loop .055" Pirelli
2000 turns
Best Time - 29:06

Weights

Wing	.009
Fuselage	.012
Tail assy	.007
Prop	.002
Total	.037

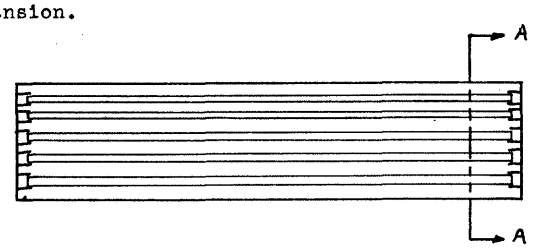
MICROFILM TECHNIQUES

Part VII - Storage Methods

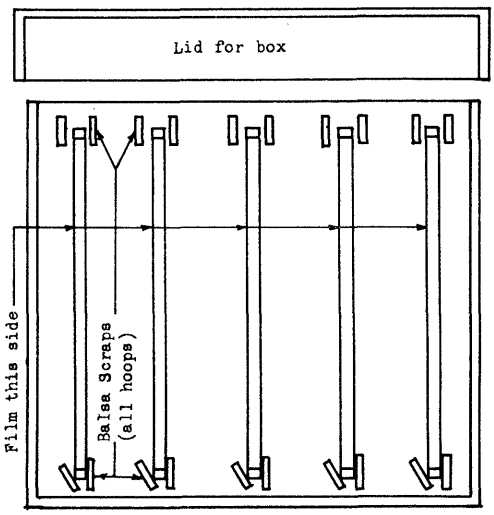
Anyone who builds indoor very much is faced with the problem of storing microfilm. Not only is it wasteful of time to pour only a few sheets at one time, it is a very fortunate builder who can count on getting the exact kind of film he wants, "on demand", every time. Good film doesn't spoil and is usually improved by ageing. It is so convenient to have some extra sheets on hand when you drop the pliers through the sheet you were about to use! Besides, the nature of the beast is such that when you start pouring and get good film, you better pour like crazy until you run out of hoops - next time it may not work so well!

If you are blessed with a surplus of closets, you can use a closet to hang the film in, and it seems likely to be the best method. For those less fortunate, some other container (portable or fixed) is the best answer. Ernie Kopecky built a special cabinet which has rack storage for about 20 hoops of varying sizes - probably the second best solution. My reasons for rating the closet over the cabinet is that you likely would have more free air space for each hoop. There is some evidence that free air circulation around curing film is beneficial; in fact, both Lew Gitlow and Gerald Skrjanc (MicroDyne and Micro-X) recommend circulating air for film curing.

And then, we come to the rest of us. My third choice is to use high-density storage of hoops in separate cardboard boxes which are then squirrelled away wherever they will fit. The sketch below details my largest box which holds five hoops 9" x 38" (almost 10 sq. ft. of film) in only about two cubic feet of space. The box is sturdy, and the lid fits tightly enough to help prevent the box from twisting or distorting during handling. Although the hoops are not tightly held at the top (the wedge at the bottom should provide a snug fit), accidental rough handling has broken only one sheet of film and that one was rather brittle silver film. The dimensions of the box are not critical, except that long ones for big hoops are hard to find. By far the easiest approach is to find boxes of the appropriate length and build the hoops to fit. Remember that the hoops will expand lengthwise if you use the soak-the-hoop method of attaching the film to the hoops; if you use rubber cement, there will be little expansion.



TOP VIEW



SECTION A - A

TOO MUCH GLUE?

Everyone who approaches Indoor planning to be a very serious flier soon begins to worry about the weight of his models. Three areas of practice need to be ironed out to achieve the weight that the top fliers regularly build to. Perhaps the easiest (in terms of time) area to improve is in weight of covering - microfilm. Once you learn to pour and handle film in the gold range, you have saved about all the weight you can. Typical beginner film weighs about .0025 oz./100 sq. in. (about .006 oz. for a typical FAI size model); while gold film comes in at about .0007 oz./100 sq. in. or .0017 oz. on a FAI.

The second significant area for weight decrease is structural weight. This usually is a process of trial and error combined with carefully detailed records of component weights. That is, build the parts lighter until they become too light to handle safely. As this process continues, you learn to pick balsa properly and you learn to handle the light models so they don't have to be so strong.

The final area of weight saving is also structural - proper use of glue. This can be the final 15% to 25% weight improvement, and without careful and unceasing vigilance during model construction the model weight will creep up. As an example, one of my typical FAI built-up booms weighs .0031 oz., but one came out .0033 late one evening. So what's .0002 oz.? Not much, but it is 6.5% of the boom weight and a similar slip in the weight on the whole model brings it from .035 oz. to .037 oz. This is the way to bring your model weights down! What caused the extra .0002 oz. increase? I had let the glue supply evaporate just enough to increase the weight!

The following hints come from Frank Cummings, who I consider to be one of the top model craftsmen in the world; I saved 10% on the first model I built after my visit to Frank's house. First, use thin glue sparingly and put it only where the joint is. The joint must fit exactly; you can't fill up the cracks with glue and still keep it light! For those who built on plastic-covered plans, if there is a visible "flash" of glue at any joint you probably used too much glue on all the joints. If you build on a standard jig and the wing sticks to the jig at any rib joint, you probably used too much glue all over.

Keep careful records of component weights, in great detail. Frank (and a good many other builders) can tell very closely the weight of almost every dab of glue in a model. This is one I haven't managed yet: one of Frank's motor sticks will weigh almost the same after the seam is glued as it did before soaking and rolling. That is, the glue seam will weigh about the same as the natural moisture which gets baked out of the wood in the oven! How? First, the edges of the seam must fit exactly. Second, the glue is applied in a very thin bead which touches only the edge of the wood and the excess which squeezes out is wiped off.

As with other construction jobs, the proper tools are essential. A glass hypodermic syringe with #25 needle is ideal - this size needle uses .008" diameter wire for a stopper. Grind the end of the needle flat and de-burr it so the glue can be applied exactly where it is needed. Of course, glue must be thin to pass through this small hole; the ideal glue will be almost water-thin. A little experience will dictate just how thin to make it. What glue to use? Both MicroDyne (Lew Gitlow) and Micro-X (Gerald Skrjanc) sell very good glue; DuPont Duco is also very good. All of these glues need to be thinned quite a bit before being used; while you are at it you can set up the drying time to suit yourself. Just use a mixture of acetone and butyl acetate, varying the proportions to give an appropriate drying time. Remember, no matter what kind of model you are building or what various glue manufacturers claim about the strength of their fast-drying glue, glue joints in wood depend upon the glue to soak into the wood in order to make adequate joints. A thin skin of glue that has "roots" into the wood will be stronger than any size glob which lies passively in the corner and hasn't soaked in; it will be much lighter too!

The Voice of N.I.M.A.S.

INDOOR

.EWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

INTERNATIONAL ISSUE
SPECIAL LIMITED EDITION

SECOND ISSUE - MAY 1966

THE 1966 INDOOR WORLD CHAMPIONSHIP

The Central Aeroclub of Hungary will host the 1966 Indoor World Championship at Debrecen, Hungary, from July 14 to July 18, 1966. The contest site will be the assembly hall of the Kossuth University; the hall has a ceiling height of 29 meters and a floor area measuring 28 meters by 25 meters.

National Aeroclubs who are members of FAI can each enter one team consisting of three fliers and a team manager. The entry fee is $40 American or an equivalent sum in the currency of the entrant's country for each team member; entry deadline is May 20, 1966. The entry fee is to be remitted to Account # 176985 K 95 at the Hungarian National Bank and the entry form should be sent to:

Central Aeroclub of PRH
Budapest IV
Gorkij fasor 6, Hungary

Please make special notice of the entry deadline as noted above; this is one of the major reasons this newsletter was started. In 1964, at least one country made a late entry and it was decided that a special effort to publish the deadline was in order.

Why a special effort? A recent CIAM ruling provided that any World Championship event which cannot be held for lack of host or lack of entry (minimum of five entries required for World Championship events) for two consecutive times would be dropped from the international competition schedule. Since the 1964 Indoor Championship was not held for lack of entry, we must hold the 1966 event or lose it.

POTENTIAL ENTRANTS

The United States has a three-man team entered in the World Champs; Joe Bilgri, Frank Cummings and Bud Romak. The team manager, Tom Finch, may not be able to attend, although this is not definite.

Germany has chosen a three-man team; it has not been noted if a formal entry has been made. Their team: Max Hacklinger, Hans Beck and Werner Strattner. Late word is that Hacklinger will be unable to attend and that a replacement for him is being sought.

Austria will be represented by Manfred Koller from Salzburg; it is not known if any of the Viennese fliers will go.

New Zealand will probably be represented by John Malkin who plans to send his model to be proxy-flown; he made modeling history when he shipped his model 12,000 miles for proxy entry in 1962.

Two Canadian fliers have requested that they be permitted to represent Canada; if they do, it will be the first time Canada has attended an Indoor World Champs.

No word has been received from Hungary about who will be on their team; Rudi Beck is chiefly responsible for Hungary's offer to host the World Champs and it is likely that he will be on the Hungarian team.

English indoor fliers are working toward a possible entry; they have already resumed flying sessions in the Cardington hangar.

SPECIAL PACKING AND CONSTRUCTION HINTS

The Shipping Box

The model box must be rigid enough to be stacked with other cargo and withstand normal handling. It should be completely waterproofed regardless of how it is shipped or carried. The opening (lid or removable side) should be re-inforced, the mating edges should be sealed with weatherstripping along the edges and removable tape over the parting line. The box should be labelled to show which side is the top, where the box is opened, and there should be complete instructions on how to open the box posted prominently on the box. John Malkin relates how his box was constructed, handled and protected:

"The box to carry the model was made of 3/16" plywood with 1/2" square stiffeners in the corners. The box was 9" x 9" x 38" and was all nailed together except for the top and one long side (See sketch below).

After making two practice runs to mount the model in the box and close it up, I wrote two sets of instructions on how to open the box, giving the steps in reverse of the procedure I used in closing the box. I glued one of these sets onto the timber of the box, then wrapped it all in a sheet of brown paper and tied it up and teped all the joints. I glued the second set of instructions on the outside along with a note to the Customs Officials to please not open the box until the addressee was present. The box was also marked with notes requesting gentle handling. The model arrived in England with only a small hole in the film on one wingtip; this possibly could have been done during packing.

The box was shipped Air Cargo and was delivered to the shipper on the day a flight was leaving to avoid any chance of damage in storage."

It should be noted that not all the above is applicable if the models are accompanied by one or more team members. However, the team manager (if only one man is with the team's models) should be able to safely open the boxes for customs inspection if necessary.

Packing The Models

The sketch below shows how John Malkin's model was packed; his description follows:

"To pack the model I took the stab off and spot-glued it to the inside of the lid of the box. The fuselage was fixed in two balsa carrying blocks (see Fig. 2) which were glued to the bottom of the box. I sent six props and these were fixed on the bottom of the box in jigs like the fuselage mount. To fit the wing I fixed two 1/8" square balsa pegs (well sanded) to the rear of the box at a distance that suited the bracing and then slid the wing onto these. This allowed the wing to "float" in case of a sudden shock. I then screwed on the front and top of the box." (See Fig. 3 for wing mount sketch)

Car-Top Carriers

Several European fliers live close enough to Hungary to make an auto trip feasible, so I will pass on my own experience with carrying indoor models this way. The box was constructed of 1/2" plywood screwed together; metal trim outside the box served as added reinforcement. The top was removable by removing wire lashing at six points around the edge, and the joint was weatherproofed with weatherstripping all around. The entire box was waterproofed with epoxy paint; two coats outside and one inside. The epoxy was chosen for its high gloss finish which, along with the white color, helped shed the Texas sunshine very well. Fig. 4 shows the packing arrangement used; the models were packed in pairs in cardboard boxes. Inside the boxes the models were packed similarly to how John Malkin packed his, except that the wings were mounted on plug-in blocks as described in the first issue. The advantage of putting two models in one box is that the stabs can be left on and the box will hold two models as shown in Fig. 5.

The models survived an 1800 mile vacation trip to the '65 Nats with no damage; they stayed dry in spite of two driving rain storms. During the round-about return trip one rain storm was encountered which got some water into the box and the Texas sun "steamed" some warps into the models. I'm pretty sure that the box was improperly sealed, or this shouldn't have happened. One comment: this box is far too heavy to handle easily, and could have been built from 1/4" plywood.

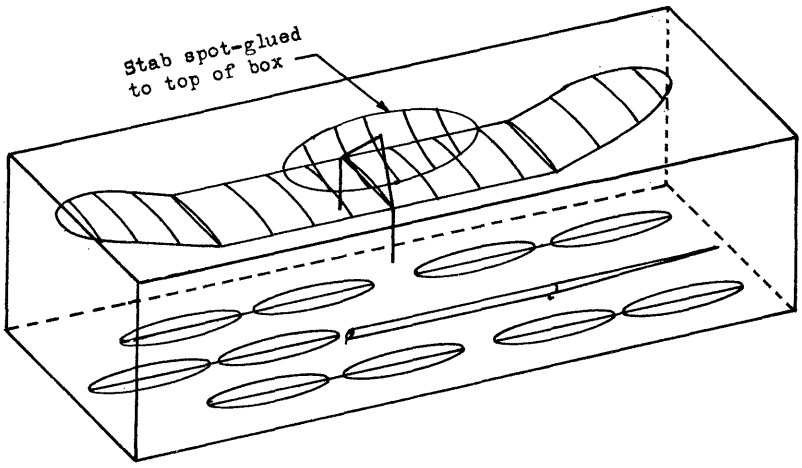


Fig. 1 - John Malkin's Box

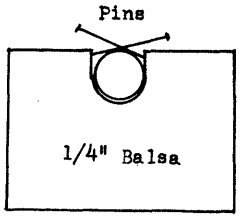


Fig. 2 - Motor Stick Mount

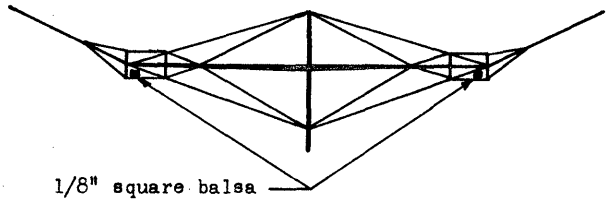
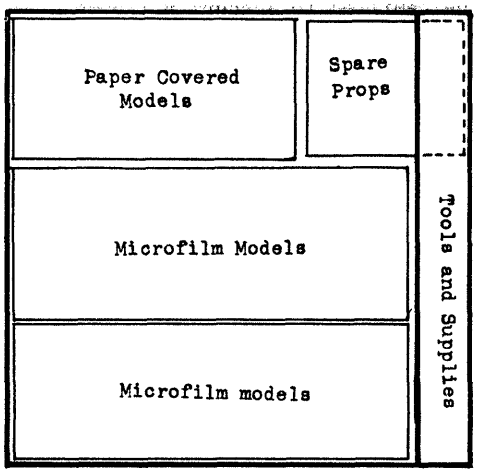


Fig. 3 - Malkin Wing Mount



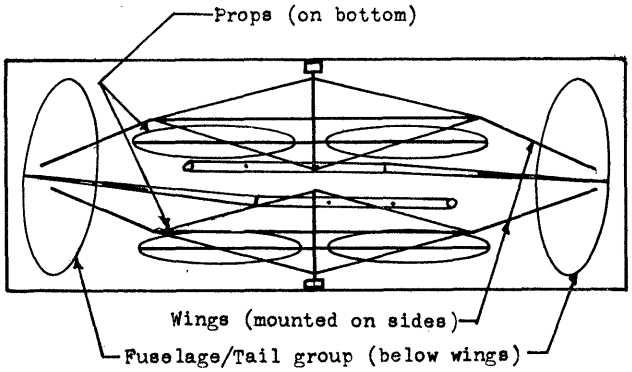


Fig. 5 - Top View of Model Box

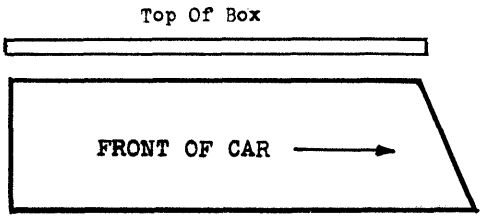


Fig. 4 - Car Top Carrier

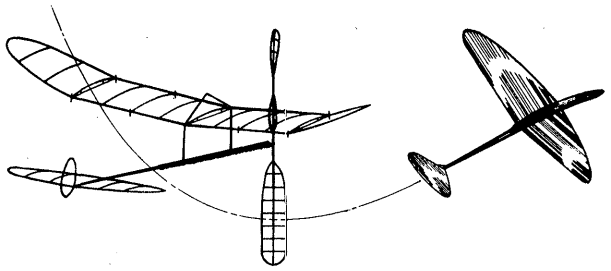
A SPECIAL REQUEST

The next (and final) issue of the limited international issue will contain comments about drift, flying techniques in small sites, balloon steering, and adjusting models for high ceilings in lower ceiling sites.

If there is any special topic that should be covered, please write and suggest it. Also, I would like to hear from each country receiving this paper if they are entering and who their team members are. Please send this information to: Bud Tenny, Box 545, Richardson, Texas, 75080, U. S. A.

The Voice of N.I.M.A.S. JUN·1966

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

*DENNIS ARONSON, 2467 Purdue Ave., Los Angeles, Cal.90064
DONALD G. GAROFALOW, 552 Spring St., Teaneck, N. J. 07666
DALE HACKER, 25599 Breckenridge, Euclid, Ohio 44117
BRIAN HACKER (Family
DALE HACKER Memberships)
SCOTT HACKER
RICHARD MILLER, JR., 145 Baltusrol Place, Dublin, Cal.
E. B. TURNER, 1312 W. College, Grand Prairie, Tex. 75050
JIM VALE, 1818 Frankfort Ave., Philadelphia 25, Pa.

*Dennis was a NIMAS member several years ago, and dropped out for two years service with the Peace Corps. Welcome back, Dennis!

Honorary Members

HANS BECK, 85 Nurnberg 34, Am Weissensee 6, Germany

Special NIMAS Project!

It has been suggested that the U. S. Indoor Team take with them indoor supplies of the type that would be in short supply behind the Iron Curtain. From information that we have, this could be almost any supplies except robably glue. Anyway, why don't we make it a NIMAS project to make some of these supplies available so the Team can deliver them? Charlie Sotich has agreed to be the collector for these items; he will assemble all the donations, package them and deliver them to the team. Send music wire, wood (carefully packed), teflon washers, rubber, bracing wire, etc. to Charlie Sotich, 3851 West 62nd Place, Chicago, Ill. 60629 not later than June 25, 1966.

NIMAS Aces

When the air was good at the St. Edward High gym (the 7th Annual All-Scholastic Aircraft Show), Bob Randolph was ready. He set three new records and qualified as the second NIMAS Ace with these three awards: Silver Cat. I Rubber - 11:36; Gold Cat. I Rubber - 13:09; Diamond Cat. I Rubber - 16:05.5. The Silver flight boosted the Paper Stick mark by two seconds before colliding with another model; the other two flights were with his FAI model and set new D Stick and FAI records. Good work, Bob!

The July Issue

Because of an early expected departure for Washington, I will have to finish the July issue early. Please send anything for that issue not later than July 2, 1966. The issue may also be abbreviated.

Antique Book

The AMA Supply and Service Section has a few copies of INDOOR FLYING MODELS at $1.50 each. Published by Ron Warring in 1946, this book is an interesting excursion into the past. The book covers Round-The-Pole models very well, plus giving about half the 80 pages to micro-film models as they were in 1946. See page 7 of the May 1966 Model Aviation for an order blank.

FAI INDOOR REPORT

New Manager Chosen

Part of the rush around here has been the fact that your editor was lucky enough to be chosen to replace Tom Finch as manager of the U. S. Indoor Team. Tom will be a hard man to replace, but I'll do my best. Wish us all an extra bit of luck, please! Aside from the luck, I am pleased to report that all team members seem to be doing well in their preparations, and we expect to do well.

World Champ Entrants

It is now possible to say that the 1966 Indoor World Championships will be held - there is no longer any doubt of there being enough entrants. In fact, this will be the largest World Champs in history, with entrants from nine countries. Germany, Hungary, Finland, Czechoslovakia, Yugoslovia, Roumania and The United States will have full teams; Austria will have a one-man entry and New Zealand will have a proxy entry. Canada and England were still trying at the last report, but nothing final has been heard from them.

RECORDS? MAYBE!

ALL-SCHOLASTIC AIRCRAFT SHOW, St. Edwards High School
Lakewood, Ohio CAT. I, 35' ceiling, May 15, 1966
Sr. HLG - 1:08.0, Bill Schubert*
Open Paper Stick - 11:36, Bob Randolph
Open D Stick - 16:05.5, Bob Randolph
Open FAI - 29:14, Bob Randolph

*Neil Shipley broke the Sr. HLG record earlier in the day with 1:07.3.

GOOFS!

No one took me seriously on the offer to "de-bug" the "MAYFEB" issue, but a couple of the worse ones need to be mentioned. First, Louis Vargo, Jr. had an * by his name, which was to explain that he was a family member. Second comes one that you folks couldn't catch - I left out a couple of items from the News column - they are included in this issue. I'll leave the rest to you!

MICROFILM TECHNIQUES

Microfilm In Industry!

The very first use of what we would call microfilm today was in the early part of this century, when free films of nitrocellulose were used in certain optical applications. In recent years free films of nitrocellulose and other materials have been put to uses that would surprise many indoor builders. Your editor was involved in some experiments in the last year which pointed up quite nicely some of the unique properties of microfilm.

Can you imagine microfilm being coated with aluminum? With a great number of other metals and non-metals? For that matter, how about a Class A ROG with well-defined aluminum numbers on the wing? In the first case, some of these coatings ranged in thickness from almost transparent (if you make it thin enough, even metal will pass enough light to appear only cloudy) to completely opaque in the visible light region. In the second case, Ray Harlan flew an A ROG recently which had his AMA number on the wing; in a color slide he sent me the numbers were clearly visible. The numbers were the idea of Jim Daley, who is an optics engineer. The numbers were put on the film before the wing was covered, and careful work on Ray's part preserved them and landed them right in the center of the wing.

If you have a large vacuum system and bell-jar handy, you can create your own designs. Jim's system had a bell-jar 21" in diameter, and the hoop covered with film was placed in the chamber just over a mask with the numbers cut into it. Below this (see sketch below) was placed a wire filament with aluminum wrapped on it. The chamber is evacuated to about 10^{-5} mm Hg. pressure and the filament is heated with an electric current until the aluminum is evaporated onto the film. In this case, the evaporation phase was terminated after 3 seconds, which

produced half-silvered (like a one-way mirror) numbers of negligible weight on the film. In similar fashion I have coated microfilm with many different materials during a research program at work.

To complete this tale of interesting facts, it has been proven that microfilm (coated or uncoated) is very hardy - it will survive exposure to hard vacuum, cold temperatures down to liquid nitrogen (77° Kelvin), vibration and shock. For that matter, in a demonstration for a model club, I loaded a 6" x 12" hoop of blue film with the following: one half dollar (placed flat, very carefully), three quarters and several smaller coins. We ran out of loose change before the film broke!

I have been purposefully vague about some of the industrial uses of microfilm, since the purpose has not been to reveal industrial processes but to give some insight into the figures quoted in Part I of this series (such as tensile strength of 10,000 to 12,000 lb./sq. in.) and the really amazing capabilities of our covering material. Let it suffice to say that industry has found a few specialized uses for microfilm and will undoubtedly find more in the future. That the technology is not wide-spread is amply reflected in a letter I recently received from du Pont. I had outlined the problem of static charge on microfilm, along with sufficient explanation of the application to tell what we were about. Although they had a suggestion which has not been evaluated (the materials are on hand; the free time is not) they clearly indicated that indoor modelers have advanced far beyond normal industrial capabilities in manufacturing and processing free films of nitrocellulose. Perk up, men! We have a well developed technical skill we never realized we had; it isn't readily marketable, but it might be sometime in the future.

These remarks conclude this series on microfilm, except for future reports on various experimental materials which must be postponed until adequate evaluation can be made of their properties and effects. In addition, some of you have indicated a desire for a summary of this material. It may be that the summary can be presented later, when it can be updated to include the latest findings and several typical formulas which will result from the research I have done.

NEWS FROM AROUND THE WORLD
(Left out of May issue!)

MARYLAND - BALTIMORE

The Baltimore Aero-Craftsmen held their annual indoor meet on April 24, in the 5th Regiment Armory. As usual, the hanging lights posed some problems, and those adept at retrieving models had a distinct advantage. The rubber event pitted all classes of models against each other via a bogey system - each model flew against the current AMA record for its class. Bob Champine won with 7:56 (86% of the C Cabin record), 2nd was Hal Crane - C Cabin, 5:26 (75%) and Bill Bigge's B Cabin copped 3rd - 3:47 (52%).

PENNSYLVANIA - PITTSBURGH

Ninety-six entrants in six events was the turn-out at the Second Annual Allegheny County Indoor Air Meet - making it the second largest indoor meet in the world. A complete report of results would be too lenghty, but the "standard" events went this way: (1st place winners)
HLG DODO - 0:15.0, Paul Hare; FLEDGLING - 0:17.0, Doug Masters; OPEN - 0:36.1, Norm Bickar.
EASY B PAPER FLEDGLING - 5:40.0, Ronnie Ganser
B PAPER OPEN - 14:20, Bob Randolph
INDOOR STICK - 9:25, Ron Ganser

STATE OF THE ART

The Model Of The Month is Hal Blubaugh's FAI - flown in the 32' Hinkley High School gym in Aurora, Colorado. The site is notable for two reasons: it was the site for the previous Open FAI record (Stan Chilton), and it is the only active Cat. I site at an altitude of 6000 feet. The altitude doesn't seem to bother the rubber models, but it has a definite effect on HLG models, according to observations by Hal and Stan. On the longest flight of the FAI pair, the model reached only 24' after a launch right at the floor. Hal tried to steer each of two previous flights; both attempts were unsuccessful and Hal ruefully admits that his son suggested that he not try to steer! Anyway, the third flight was uneventful and did the trick. In common with several recent Cat. I NIMAS Award winners, Hal's model is heavier than average. It may be relatively unimportant to have a light model in Cat. I - perhaps this is worth a study! Other items of note: The 18 x 25 prop turned just under 90 RPM, which indicates a very low flight speed, and the elliptical bracing used an adjustable post on top the cabane to aid in keeping the wire tension correct.

BRACING TECHNIQUES

Indoor model bracing is supposed to have been suggested by J. P. Glass who suggested that tungsten wire be used as wing bracing. 1935 is the year that the technique (along with built-up props) was used to any degree. Since that time bracing has been used on every part of a indoor model and the materials used have ranged from wire as suggested by Glass to human hair to synthetic fibers such as nylon and dacron. The techniques of bracing have varied from simple "limit strings" running from the wing spars to the wing posts (these carry wing up-loads only) to the picket fence bracing originated by the Oakland Cloud Dusters. Almost 25' of bracing material is used in a picket braced wing, which leads to some of the good-natured banter between proponents of picket bracing and more conventional techniques. This series of articles will explore many of the current techniques and others of historical interest; suggestions and additions are requested from anyone who wishes to contribute.

Part I - Basic Wing Bracing

Figure 1 shows the simplest form of rigged bracing now in use. Note that the bracing can be started at any point on the wing, but if it is started at either wing post it will be simpler to anchor both ends of the wire. It is quickest to do primary wing bracing with one continuous run of wire, following the arrows in Fig. 1.

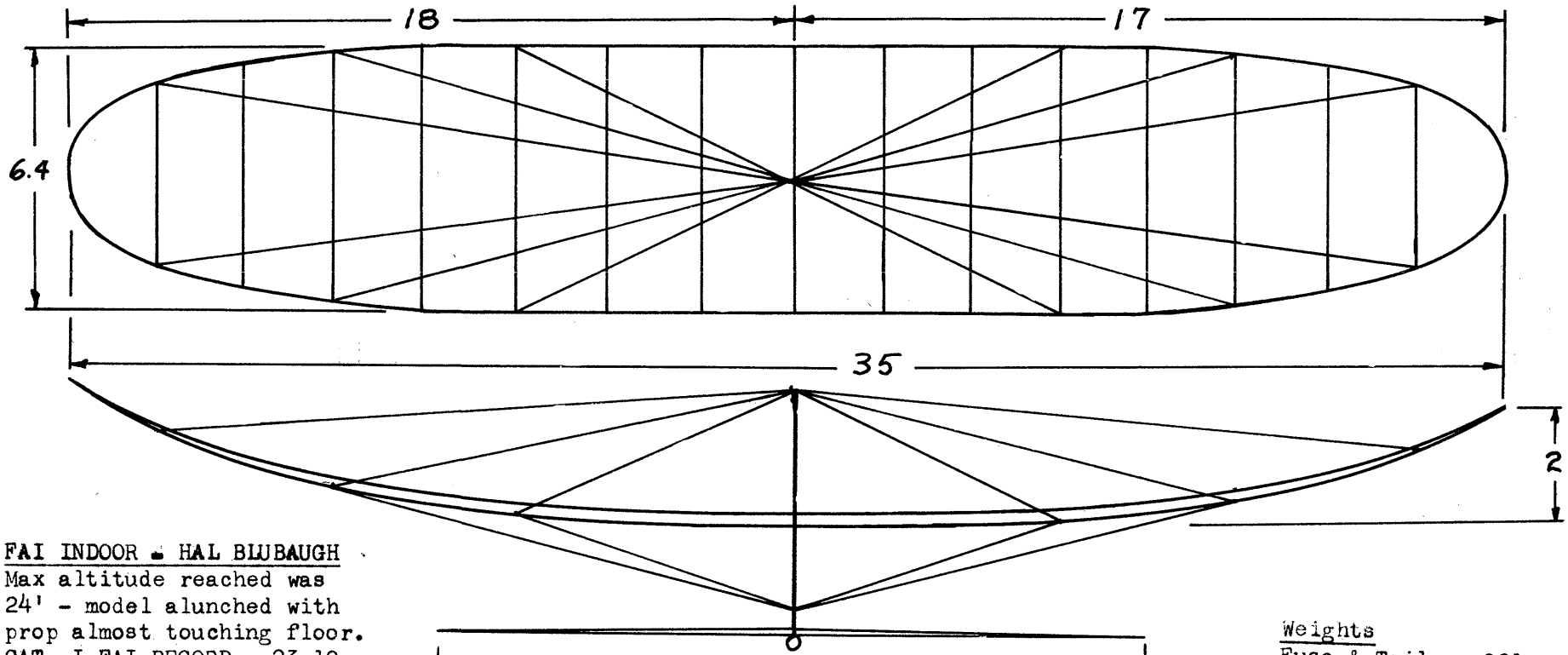
To be effective, bracing must have sufficient tension to absorb flight loads (and some handling loads) and the tension should be equal all over the wing. Too much tension will cause extra compression loading on the spars in damp weather as the wood expands; uneven tension promotes wing warps which appear unexpectedly. The most common method of tensioning bracing is to glue the wire at the starting point, string the bracing, and hang a weight on the end of the wire (see Fig. 2). The proper amount of weight depends upon the bracing material, the size of the surface to be braced, and individual experience. We have received suggestions ranging from four straight pins held to the wire by scotch tape to paper clips to miniature toy plastic clothespins; the important thing is to be consistent with a given weight range until you develop a feel for the proper tension. Figure 3 shows a special wire tension gage used by Bob Champine; in this case, the wire is tensioned and glued down one segment at a time. Finally, when dacron monofilament is used, the final end of the strand can be pulled against the anchor point (a soft balsa peg must be used) with a tug sufficient to cause the strand to cut into the balsa. The dacron will stretch just enough to maintain near-optimum tension and the dacron is slick enough that the tension will equalize in all segments of the bracing. The finishing end can then be glued and the entire bracing job can be inspected before glueing the other joints.

Design requirements for proper bracing are relatively simple; of prime concern is the angle between the primary bracing and the wing spars. This is illustrated in Fig. 4, where two extremes of angle are shown. Obviously, the length of the wing post must be enough to give the proper angle; very high aspect ratio wings may require excessive length wing posts to obtain proper bracing angles. The height of the cabane is also related to bracing effectiveness, but cabane design is usually limited by its own strength limitations. If angle "A" (Fig. 5) is much more than 90°, air loads can cause high spreading forces (shown by arrows in Fig. 5) and the cabane struts may try to buckle. If angle "A" is about 90°, it is likely that both the cabane limitations and bracing limitations will be met. To depart from the subject slightly, it is very unwise to try to save weight in the cabane - a very unreliable model will result after you have repaired the cabane several times!

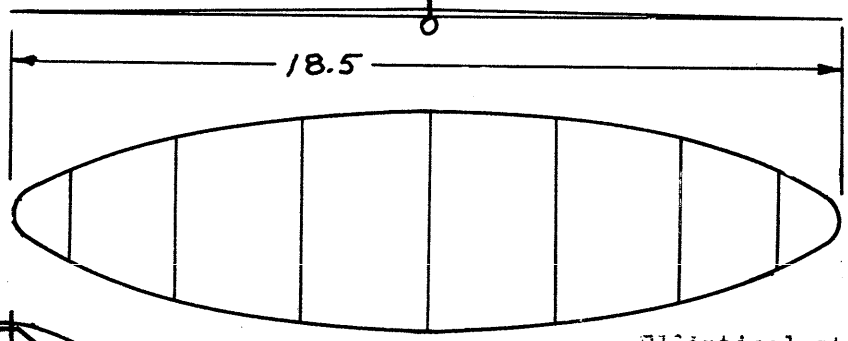
The second bracing design consideration is to choose the proper number of bracing support points. The stiffness of the spars, the wing aspect ratio and the length of the wing posts will all have a bearing on the number of bracing points chosen. Figure 6 shows a high aspect ratio wing braced at three points and a common bracing for a wing with plain dihedral.

The Sotich-type wing layout can produce special problems in bracing (see Fig. 7); a wing post which gives an adequate bracing angle on the shorter outboard wing will often prove inadequate for the inboard wing. Figure 8 shows one solution to this problem; a short vertical post on the leading edge and trailing edge increases the bracing angle sufficiently. If snug or taut film is used, it is possible to eliminate the upper half of the extra post since the film absorbs the wing down-loads. Wing repairs can be improved and weak spars straightened by a modifi-

(Cont. on p.4)



FAI INDOOR - HAL BLUBAUGH
Max altitude reached was 24' - model alunched with prop almost touching floor.
CAT. I FAI RECORD - 23:10
Set March 20, 1966
Best single flight 12:49

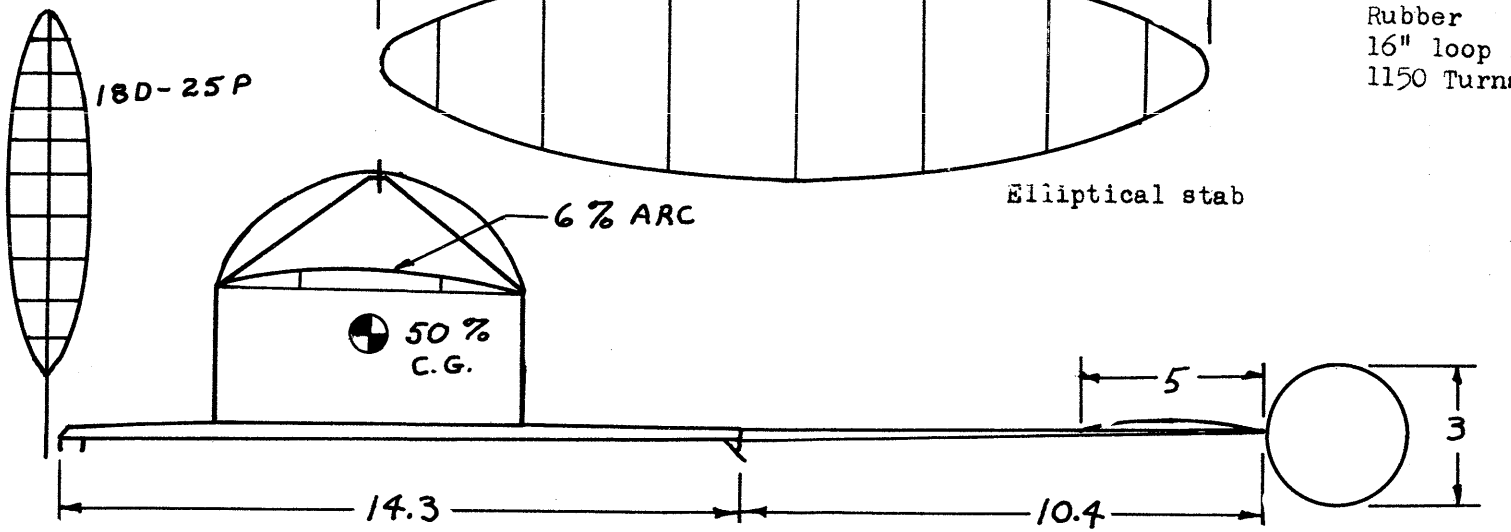


Eliiptical stab

Weights

Fuse & Tail	.021
Wing	.024
Prop	.005
	.049
Rubber	.047

16" loop .066 Pirelli
1150 Turns



cation of this technique. Figure 9 shows a spar buckled by damage or weakness; if a short strut is attached at the lowest point on the spar and bracing wire stretched tightly from point to point as shown in Fig. 9, the spar will be straightened and strengthened. Next month: Tip Bracing and Wing Bracing Summary.

A LOOK AT YESTERYEAR

Ed Whitten is responsible for the entire presentation on page 5 - I am very grateful to him for gathering the material, authoring the commentary and printing the pages used. This is indeed a refreshing glimpse into the past!

Ponder awhile Ed's last comment and ask yourself when the Golden Age of modeling really is (or was). Ed and I agree that it is now. Certainly the models are better, we have a greater variety and availability of supplies, and better communication to enable us to share our new methods and developments with others.

HINTS AND KINKS

HLG Rudder

Ultra-thin rudders on Cat. I gliders can deflect just enough during the launch to mess up the "power pattern" if the tab is not supported (or isn't stiff enough on own). If the fin overhangs the stab slightly and the e... of the fuselage is sanded thin (see sketch), the fuselage can be turned with the fin and will hold the adjustment.

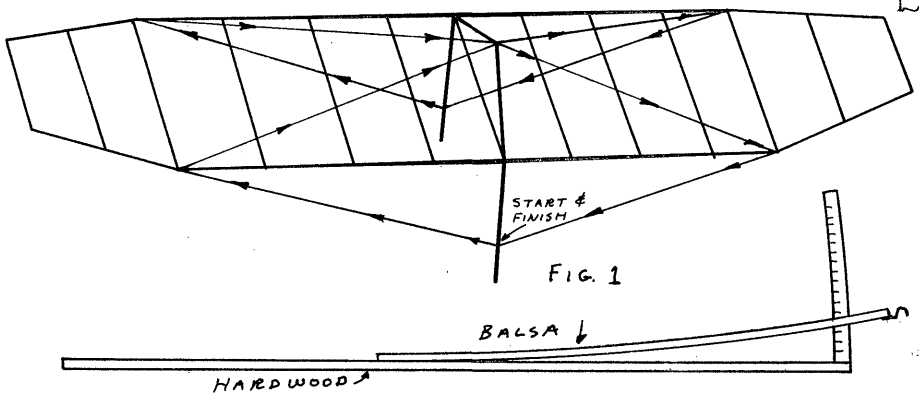


FIG. 1

FIG. 3

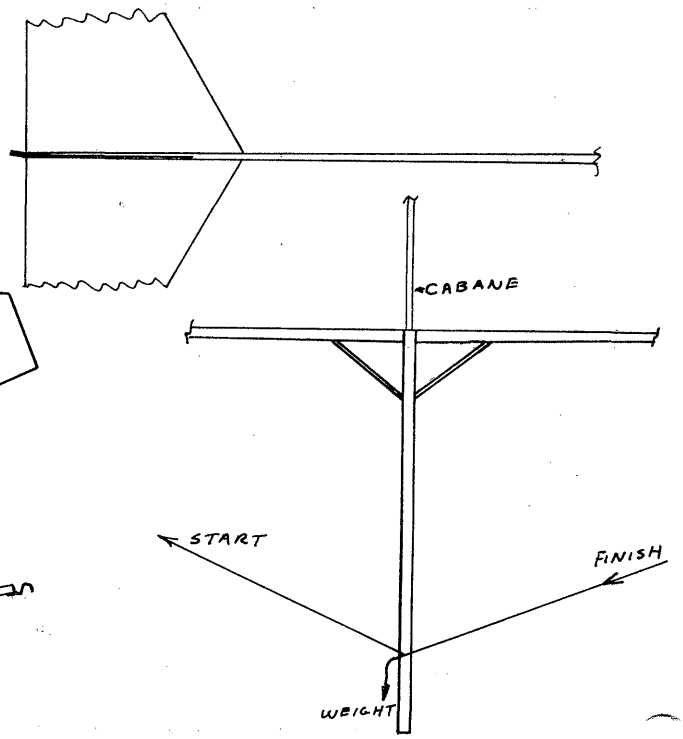


FIG. 2

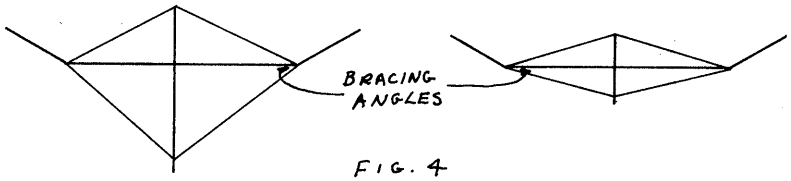


FIG. 4

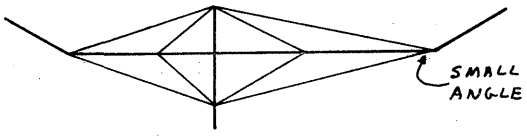


FIG. 7

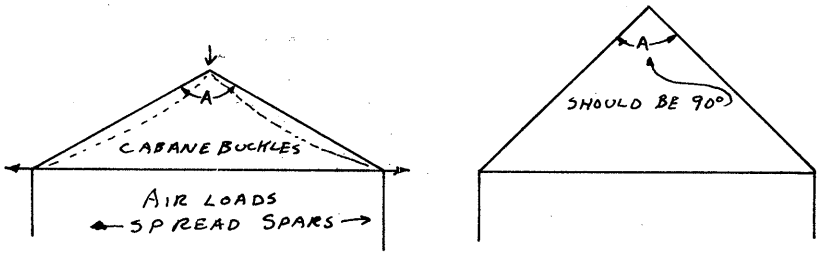


FIG. 5

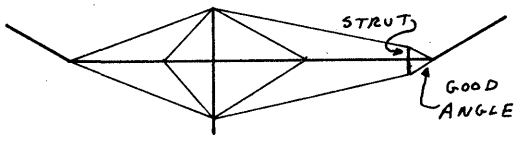


FIG. 8

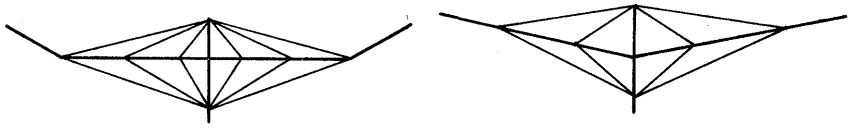


FIG 6

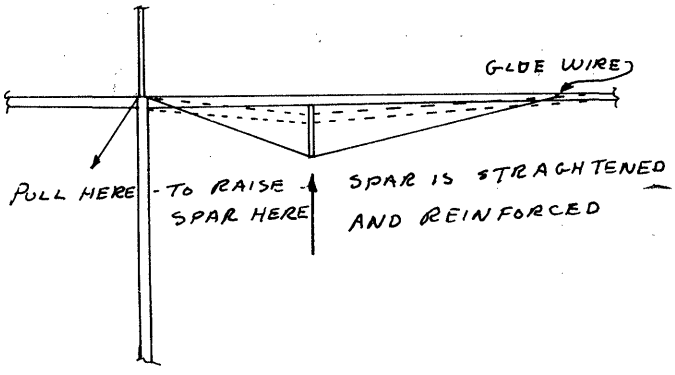


FIG 9

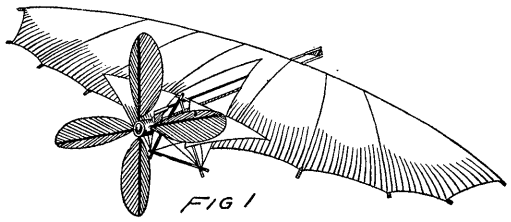


FIG 1

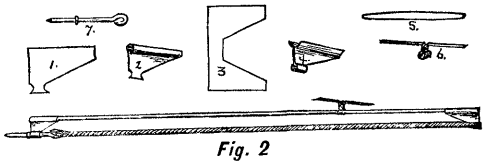
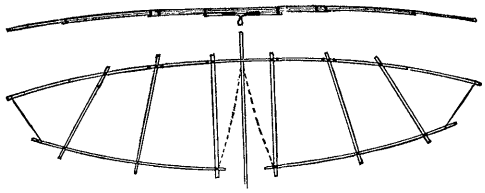


Fig. 2



This little gem is the "Elastic Flying-Machine" as described in the chapter entitled "Aerial Toys" in "Harper's Outdoor Book for Boys" by J. H. Adams and published by Harper & Brothers Publishers in May of 1907.

Quoting from the text..."The backbone was a knitting-needle. The wings, or more properly aeroplanes, were light bamboo strips (taken from a Japanese fan) and covered with the Japanese paper which is used for napkins."....and then, finally, after further painful instructions in which another knitting-needle is hammered into a prop shaft, the paper is sewed on, not gummed, the thin paper screw blades are gummed onto pieces of bamboo which are sharpened and pushed into a cork....flight adjustments are hinted at with the reminder that.. "Some little adjustment of the kind is usually required before the thing moves properly". .... That was no doubt the understatement of the decade..... But do not laugh...who said the Golden Age of model airplanes was the 1930's?

...Progress marched on.. and maybe models were even ahead of man carrying airplanes...what a challenge! Here we have something special from that classic"The Boy's Book of Model Aeroplanes" by Francis A. Collins and published by The Century Co. in October of 1910.

...This book is just wonderful...full of photographs with such titles as..."A Coil of Cane or Reed"...."Splitting a Bamboo Fish-Pole"... "A Clever Folding Model. The Wings are Broader than Need Be".. "An Ingenious French Model Made of Umbrella Wire"..."An Interesting Form which Flies Backward or Forward"..."A Well Built Model Badly Proportioned" ... and on and on. Those must have been the days (incidentally, just how many of us were actually on that scene?). One more just has to be mentioned...."Splitting the Cigar Box Cover to Build the Propeller"....With such fun as all that, no wonder pre-fabs were not popular.

Primative?...not at all. The author discourses in the latest scientific terms..center of gravity..difference between the angles of the planes...flight theory. The book's later editions were updated and the strides were enormous. But then, as today, unhappy reference was made to ..."toy aeroplanes".

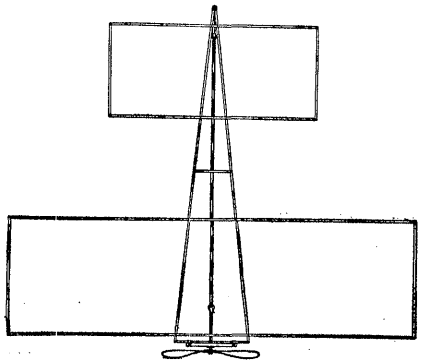


DIAGRAM FOR PLAN OF THE AËROPLANE ON PAGE 58.

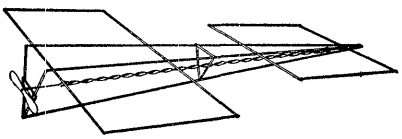
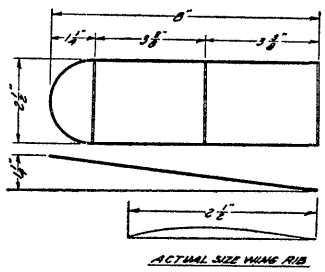
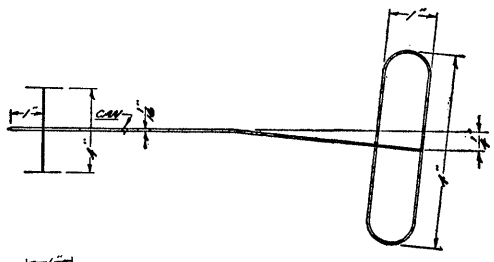


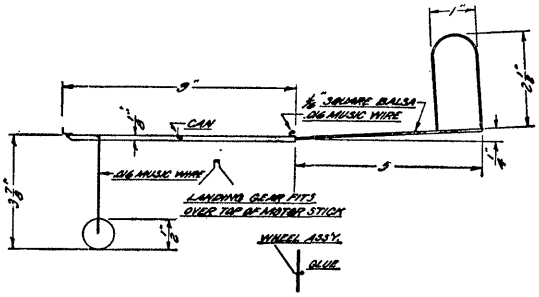
DIAGRAM — SHOWN IN PERSPECTIVE.
PLATE A.

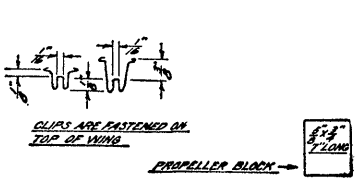
....And then we go practically modern with Glen Reichman's "Endurance R.O.G." as published in another classic "Prize Winners' Book of Model Airplanes" edited by Carl H. Claudy and published by The Bobbs-Merrill Company in June of 1931...with models reflecting 1928/29/30 designs. This R.O.G. was supposed to do.."at least ninety seconds". Frankly, it certainly was actually capable of much more. Indoor flying was well established, as represented by designs in this book. Times mentioned were four minutes....nine minutes, etc..... And it mentions such heros to us all as .....Fay Stroud... Jerome Kittel....Ralph Kummer.....and present day NIMAS member, Ed Beshar.. .... Incidentally, it also includes drawings of a very nice helicopter by Frank Salisbury, Jr. that made an official of 1:29.6 in a 50 foot auditorium...and an ornithopter by Everett Meeks....This is about where we came in ....and maybe this was the Golden Age.



ACTUAL SIZE WING RIB





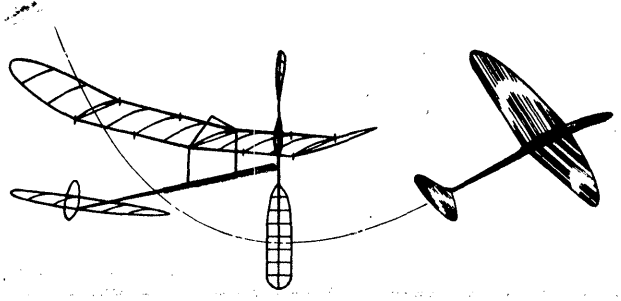


* * *

Was the Golden Age really in the 1930's?....But what about these models from the 1900's, 1910's and 1920's?...Don't they really prove that any year when <u>your</u> interest and productivity is at a peak is <u>your</u> Golden Age?

The Voice of N.I.M.A.S. JUL·1966

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

NIMAS Awards

Diamond Cat. I HLG Award - 0:36.0, Ron Wittman

Silver Cat. I Rubber Award - 10:36, Bob Wilder

Silver Cat. III Rubber Award - 31:33, Jim Clem

New Materials!

Last year Bill Bigge furnished some special bracing wire for monowire fuselage braces which was really good. It is .002" in diameter, steel wire, with virtually zero stretch until it is overstressed - then it breaks. It is more than strong enough for bracing any size of indoor motor stick, and tough enough to resist handling. It is the only material I have had stay with a model for a complete season - I literally have never worn one out yet. The only fault it has is a slight tendency to remain curled as it comes off the spool, but this can be cured by careful straightening. Bill has agreed to retail this material for $1 per spool; I can't find the note, but I believe he said 100' per spool. Get it from Bill at 5131 Massachusetts Ave., NW, Washington, D. C. 20016.

Flight Of The Phoenix

Charlie Sotich has written to recommend the movie entitled "Flight Of The Phoenix" as a movie no modeler should miss - so see it if you can.

Wish Us Luck

As I mentioned last issue, this one is indeed quite abbreviated. A sudden change in our date of departure for the World Champs has "shot down" much of the stuff that would have been in this issue. The U. S. Indoor Team will depart on July 7 to do battle at Debrecen on July 14 - 18.

'66 Nats

The 1966 Indoor Nats will be held at the International Amphitheatre at 43rd and Halsted Streets in Chicago. The site is 80' high with floor area of 123' x 238'. No final word has been received, but it is assumed that the meet arrangements will be the same as for the 1964 Nats. That is, HLG will be from 9 AM to 2:30 PM and Rubber from 2:30 PM to 9 PM. It is also possible that the special I.D. system used for the '64 Nats will also be in force. This consisted of special marking on the contestant badge of each bona-fide indoor contestant - this made it possible to keep everyone off the floor except those who had business there, and measurably improved the flying conditions by eliminating spectator turbulence. It is also very much in order for us all to remember to stay off the flying area unless retrieving or launching a model - you can't help it once it is launched, so do your praying and "body english" on the sidelines!

THE 1966 INDOOR WORLD CHAMPIONSHIP

Entry List

AUSTRIA - Manfred Koller is the only entrant.

FINLAND - Reino Hevarinen, Harri Raulio, Harro Erofejeff and Esko Hamalainen have been selected as the Finnish Team; these four will fly off to pick a manager.

GERMANY - Hans Beck, Werner Strattner and Kurt Vogler are team members; Gunter Maibaum is reported to be the Team Manager.

NEW ZEALAND - Proxy entry by John Malkin.

RUMANIA - Otto Hints, Fr. Boloni and Mihai Tautu are the team members; no word on who the manager will be.

UNITED STATES - Joe Bilgri, Frank Cummings and Bud Romak are team members; Bud Tenny is replacing Tom Finch as manager.

CZECHOSLOVAKIA, HUNGARY and YUGOSLOVIA are also entering full teams, but there is no definite word on who the fliers will be. Vilim Kmoch is reported to be the winner of the Yugoslovian elims, and Zoltan Oscody is a top Hungarian flier who may be flying; there is no confirmation of these names at press time.

The Indoor Jury for the World Champs will be: Rudi Beck - Hungary, Rudolf Cerny - Czechoslovakia and Edwin Krill - Austria. Sandy Pimenoff of Finland will serve as reserve jury member.

CONTEST BOARD ACTION

Although it was not announced for some time, Phil Klintworth resigned as Chairman of the FFCB in January of this year; it was not until late in May that I was asked to take over. The first action on Indoor items will be to modify Par. 4.7 in the Rule Book to make the practice of winding indoor models by a helper legal - we have been doing it that way for years - strictly against Par. 4.7.

Other Indoor action items will include a proposal to rule out "mike gliders" without the present restrictions on material and construction; a proposal to add Easy B to the Rule Book, and a proposal updating our Indoor Rules to present competitive standards and practices. For info about these proposals, see the following back issues of INAV: July '65, Apr. '65, Mar. '65 and Jan. '65. In future issues these proposals will be again printed and it is possible that a new NIMAS ballot will be issued to get your feelings on the proposals.

POSTAL CONTESTS

Who said indoor competition was dead for the summer? Tom Vallee has been issuing challenges to anyone who will accept; actually, that means anyone who has a place to fly right now! The following matches were held in recent months:

Tom Vallee vs. Charlie Sotich; 180' vs. 65' - Fudge = 1.66

Paper Stick
Charlie Sotich - 12:29 x 1.66 = 20:48
Tom Vallee - 18:54.6

Tom Vallee vs. Charlie Sotich; 65' vs. 31' - Fudge = 1.45

Easy B
Tom Vallee - 5:59 x 1.45 = 8:40
Charlie Sotich - 8:18

B Stick
Charlie Sotich - 14:03
Tom Vallee - 9:09 x 1.45 = 13:15

Tom Vallee vs. Hal Crane; 180' vs. 20' - Fudge = 3.0

B Stick
Tom Vallee - 18:54.6
Hal Crane - 6:05 x 3.0 = 18:15

HINTS AND KINKS

Charlie Sotich offers the following suggestion: Lube your rubber motors inside a small plastic bag, so your hands won't get messed up. The rubber and lube are put inside the plastic bag and the excess lube tends to stay inside the bag when you remove the motor.

THE MANHATTAN FORMULA

The Manhattan Formula model was proposed by Ed Whitten in the Nov. '65 INAV as a new model type which has an appeal for those who want an indoor model with construction similar to Indoor Scale and better performance. The first group to try this type of model are members of the Royal Canadian Air Force stationed in the northern part of Manitoba, Canada, at Gypsumville. Preliminary reports indicate very satisfactory results; perhaps a report in more detail will be available soon.

A LOOK AT YESTERYEAR

In 1948 Bill Winter published the Plan Book, and it featured an article by Bill Tyler entitled "The Indoor Model". It is with grateful appreciation to Bill Winter and Bill Tyler that we present the material on page 3 - This material was arranged and printed by Ed Whitten, so thanks also to Ed. Except for better materials and wire bracing, our present models are quite similar!

BRACING TECHNIQUES

Part II - Wing Tip Bracing

Last month several types of bracing for wing inboard panels were discussed; most of the basic bracing types will work well with the tip bracing schemes discussed in this section.

One of the most common types of tip bracing is the type used by Carl Redlin's "Contender" (Fig. 1); Bob Champine's FAI used a variation of the same thing (Fig. 2). Bruce Paton used another similar rigging as shown in Fig. 3; all these bracing schemes have the common characteristic of transferring tip loads through the secondary bracing to the cabane and wing posts. Bill Atwood's tip bracing transfers this force directly (Fig. 4) and is my personal choice for tip bracing. My reasons for this choice are: The tip is braced independently from the inboard panels, which lessens the chance of damage to one panel carrying over to the adjacent panel (a folded wing tip is likely to buckle the spar between the primary and secondary brace points); it is easier to brace and uses fewer small struts; and finally, the tip is stiffer with Atwood bracing. Disadvantages of this bracing are that it requires more wire than other methods, it causes compression loading on the rib located at the point marked "A" on Fig. 4, and the long top wires sometimes cause a handling problem if you're as clumsy as I am.

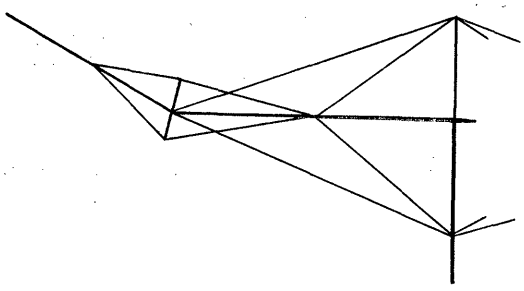
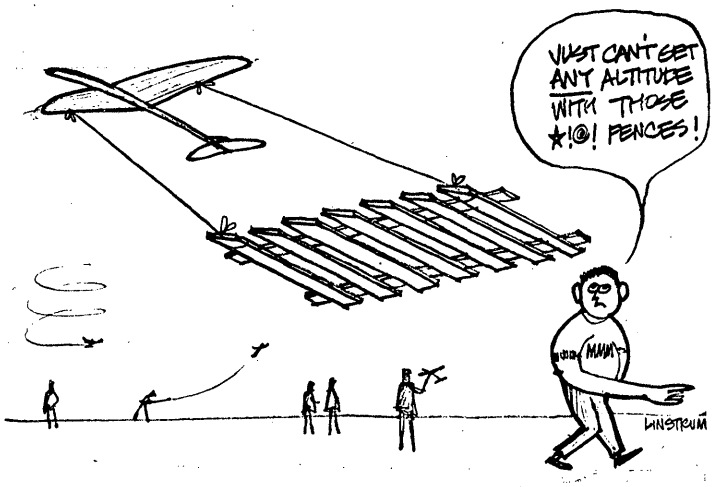


FIG. 1



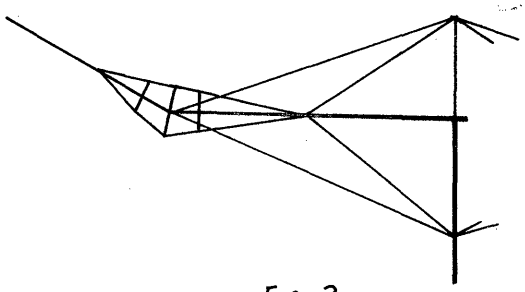


FIG. 2

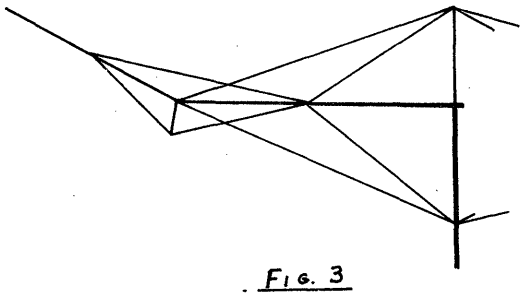


FIG. 3

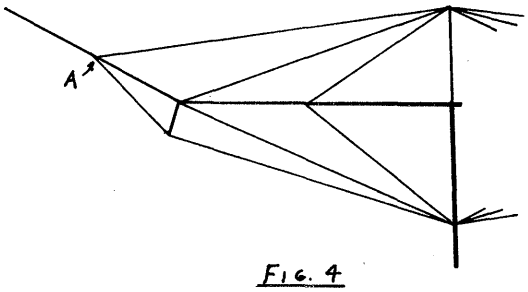


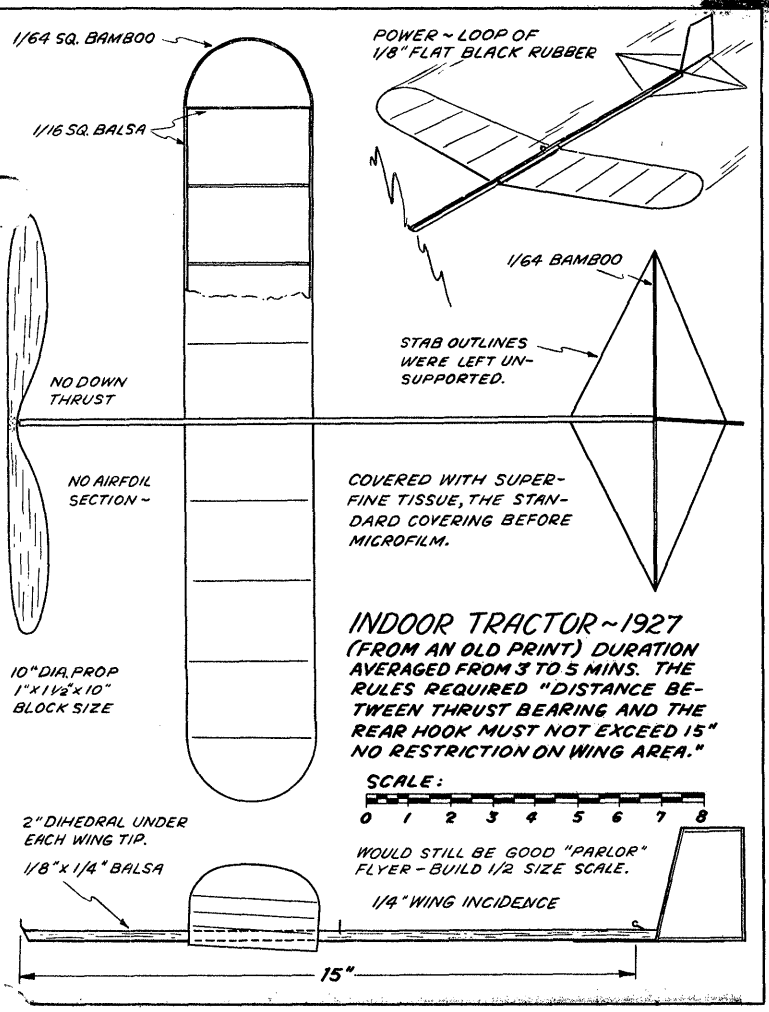
FIG. 4

SORRY, FOLKS

That's all there was ready when the balloon went up! Twenty-four hours ago, I received notice about the change in deaprture plans; I had to take what was ready at the time, due to the printers being closed on July 4. The rest of Part II of "Bracing Techniques" will appear probably in the September issue - the August issue will have reports of the Indoor Nats at Chicago and the 1966 Indoor World Champs. Don't be too worried if the August issue doesn't appear until after the 15th - see you then!

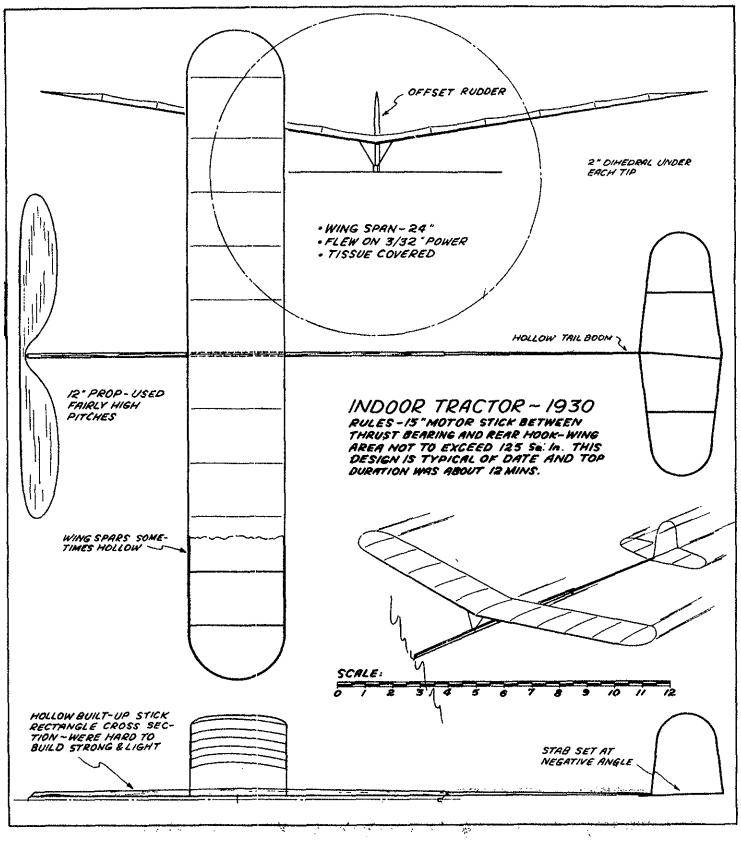
20 YEARS of INDOOR PROGRESS - 1927-1947

Drawings by Bill Tyler from his article "The Indoor Model" in Bill Winter's "MODEL AIRCRAFT PLAN BOOK"



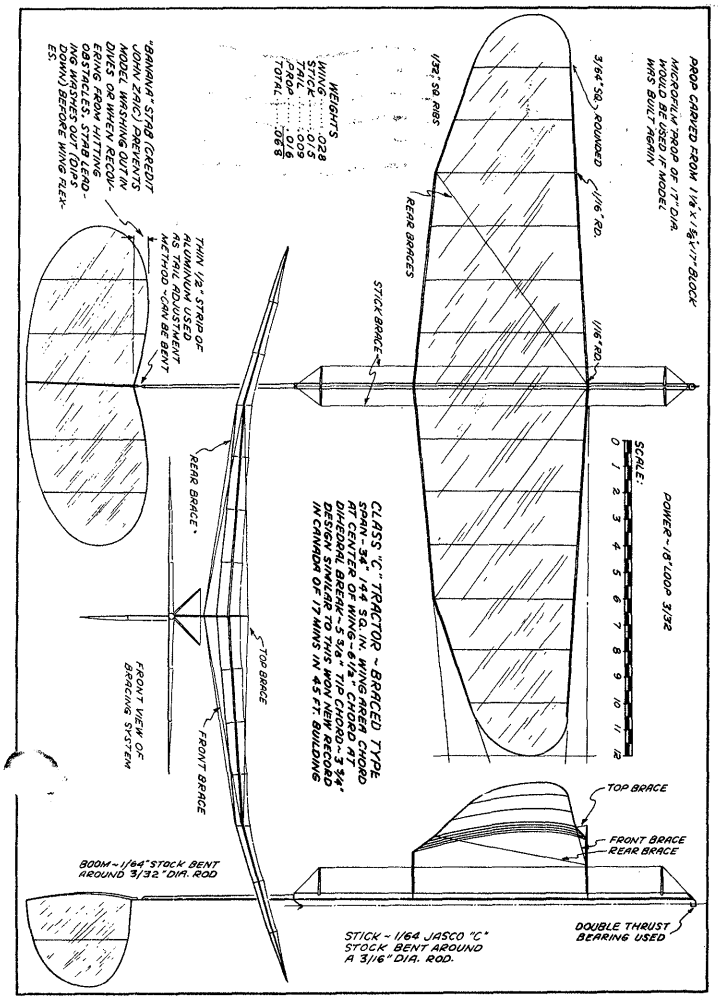
INDOOR TRACTOR ~ 1927

(FROM AN OLD PRINT) DURATION AVERAGED FROM 3 TO 5 MINS. THE RULES REQUIRED "DISTANCE BETWEEN THRUST BEARING AND THE REAR HOOK MUST NOT EXCEED 15" NO RESTRICTION ON WING AREA."



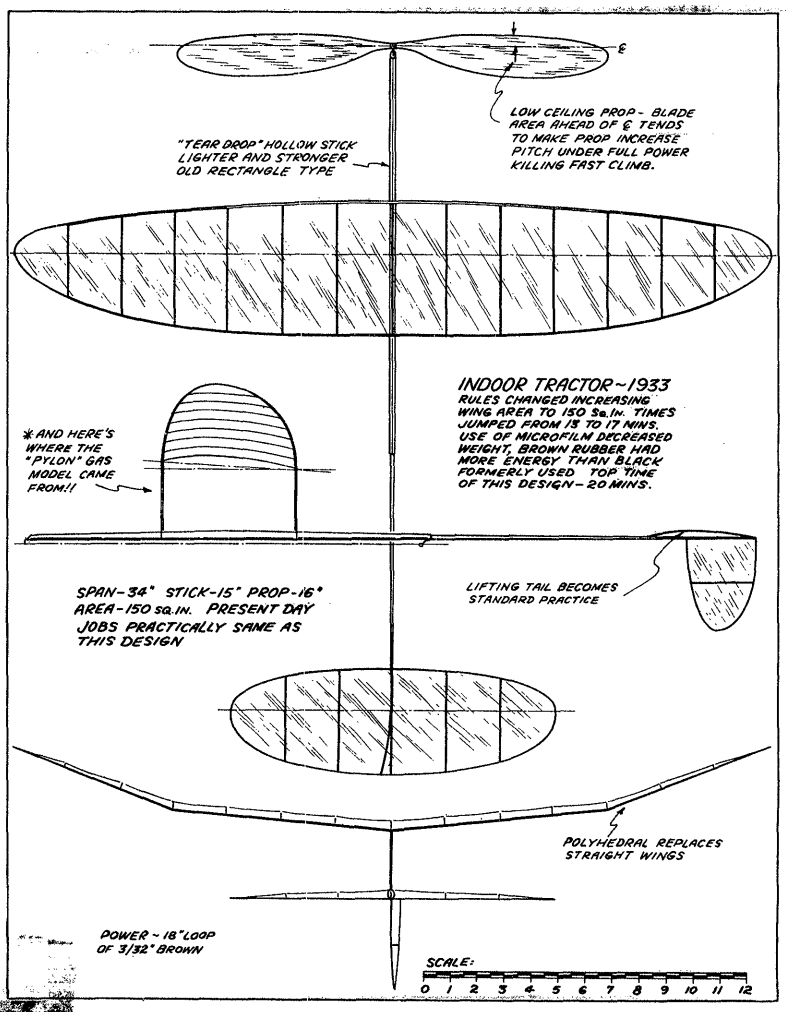
INDOOR TRACTOR ~ 1930

RULES ~ 15" MOTOR STICK BETWEEN THRUST BEARING AND REAR HOOK ~ WING AREA NOT TO EXCEED 125 Sq. In. THIS DESIGN IS TYPICAL OF DATE AND TOP DURATION WAS ABOUT 12 MINS.



INDOOR TRACTOR ~ 1933

RULES CHANGED INCREASING WING AREA TO 150 Sq. In. TIMES JUMPED FROM 13 TO 17 MINS. USE OF MICROFILM DECREASED WEIGHT, BROWN RUBBER HAD MORE ENERGY THAN BLACK FORMERLY USED. TOP TIME OF THIS DESIGN ~ 20 MINS.

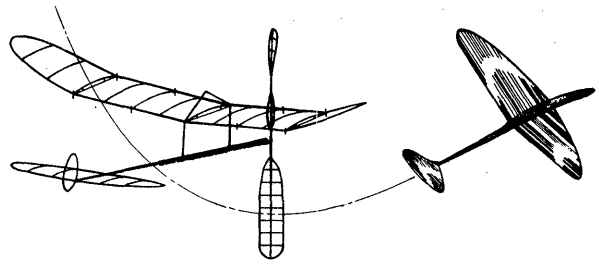


The Voice of N.I.M.A.S. AUG·1966

INDOOR NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL



OFFICIAL RESULTS - WORLD INDOOR CHAMPIONSHIP

Debrecen, Hungary July 14-18, 1966

			I	II	III	IV	V	VI	Total
1.	Hans Beck	Germany	27:26	30:42	29:23	32:42	32:12	7:08	64:54
2.	Joe Bilgri	U. S. A.	23:10	29:35	30:48	21:03	26:17	5:45	60:23
3.	Reino Hyvarinen	Finland	:09	8:00	26:00	26:59	17:04	27:14	54:13
4.	Jiri Kalina	Czechoslovakia	22:04	23:09	8:16	30:46	13:23	15:10	53:55
5.	Bud Romak	U. S. A.	20:26	25:30	:24	24:25	10:27	27:51	53:21
6.	Manfred Koller	Austria	21:51	24:32	25:37	25:52	27:13	8:28	53:05
7.	Zoltan Oscodi	Hungary	21:47	14:37	19:30	27:52	24:00	24:57	52:49
8.	Esko Hamalainen	Finland	7:46	10:54	24:40	26:12	6:23	10:20	50:52
9.	Werner Strattner	Germany	:15	18:03	:18	8:03	23:07	25:08	48:15
10.	Geza Varszegi	Hungary	7:59	21:17	5:07	17:51	24:00	24:02	48:02
11.	Kurt Vogler	Germany	0	18:59	23:45	23:51	23:57	16:30	47:48
12.	Frank Cummings	U. S. A.	20:58	9:30	6:25	23:15	9:20	23:14	46:29
13.	Harri Raulio	Finland	14:20	11:15	20:45	17:55	22:35	23:43	46:18
14.	Karoly Biro	Hungary	:19	:09	25:15	:20	7:36	20:46	46:01
15.	Otto Hintz	Romania	21:42	23:01	8:27	18:37	17:47	3:55	44:43
16.	Josef Gabris	Czechoslovakia	21:59	2:01	:33	16:36	22:22	17:54	44:21
17.	Vilim Kmoch	Yugoslavia	24:36	18:42	6:37	13:07	:46	7:28	43:18
18.	Dagmar Chlubna	Czechoslovakia	15:32	7:40	8:17	17:40	:27	23:42	41:22
19.	Teodor Strasberger	Yugoslavia	7:16	19:58	20:59	18:12	20:21	19:24	41:20
20.	Leopold Gabrijel	Yugoslavia	:40	16:38	:28	7:25	22:42	9:15	39:20
21.	Mihail Teut	Romania	18:30	6:35	1:12	:11	19:22	16:56	37:52
22.	Ioan Serban	Romania	13:36	:34	16:45	0	16:17	:22	33:02

Team Standings

1.	Germany	160:57	5.	Czechoslovakia	139:38
2.	U. S. A.	160:13	6.	Yugoslavia	123:58
3.	Finland	151:23	7.	Romania	115:37
4.	Hungary	146:52			

The 1966 Indoor World Championship -

From The Sidelines

The American team found that an 8000 mile trip with indoor boxes can be both interesting and harrowing; it rapidly became clear that the Manager is very useful on such a trip. His major function (after the travel has been arranged) is to carry whatever luggage the others can't carry!

After our mad dash across Europe, guarding model boxes from real and imagined dangers, bribing baggage handlers and even buying first class passage for the boxes from Budapest to Debrecen, it was a relief to settle down in the hotel to repair the models.

Our spirits were high after opening one of Romak's boxes at Customs - it looked as if minor warps were all he had to contend with. Bilgri had a warped wing which he replaced by bracing a spare covered wing that he had brought along, plus recovering two stabs and making other minor repairs. Frank Cummings had more problems - none of his wings were flyable, and he had many hours of patient work before his models were ready to go.

How do you make microfilm in a European-style hotel, where the room has only a wash basin, the water closet is some other place and the bath still another? Would you believe a plastic sheet on the tile floor under the wash basin? Frank got his repair film this way - two tries and two sheets. Romak tried the bathtub; try to make the chambermaid understand you want only cold water when you don't speak Hungarian! Further, try to explain to the anxious chambermaid (another job for the team manager) that Bud hasn't drowned and everything is OK. I didn't even try to explain the hoops of film as I carried them back to the room! I imagine the chambermaids were glad to see us go - they seemed to think they were shirking their duty when we wouldn't let them clean the room until we left!

We were given a royal reception by the Debrecen Aeroclub when we arrived - plus transportation to the hotel and an invitation to fly daily at the University. We arrived for the first session during the turbulent part of the afternoon, and the models would hardly fly. Change the rubber, change the props for faster ones, tighten the turn and re-trim the ships - finally they began to fly pretty well. Top time for the first session was by Varszegi - over 24 minutes. Hans Beck arrived late that day and just watched, but he had a bottle of hydrogen to pep up the balloons which were pretty soft.

The closer it got to time for the contest to begin, the more test flying there was. Only the Yugoslavs (who arrived late on July 14) missed out on test flying. Hans Beck put his models away on July 13 after logging a 29 minute flight, and spent his time helping the rest of the German team. Manfred Koller got a 26 minute test hop, the Americans were settling for 24 to 28 minutes, and Otto Hintz got a 22 minute flight.

The crowded practice sessions yielded some collisions that hurt; the worst was a three-way bash between Harri Raulio, Esko Hamalainen and Ioan Serban. The Romanians lost several models to collisions and really had to work hard to keep flying.

The practice sessions served to get everyone somewhat familiar with the air currents in the site, and to get them used to the galleries which surrounded the site on three sides. Spectators were always present during the flying, which increased the hazards; still, the galleries had one advantage. It was possible to go up to the third-floor gallery and watch your model at close range during the end of the climb and first part of the cruise. This was enlightening for several people - and gave them a chance to get better adjustments.

Day One. In Round One, conservative flights were the order of the day, but at least three models hit the wall. Esko Hamalainen demonstrated the danger of hitting the

side arches - down his model came minus a lot of film. Frank Cummings remembers the first round as the only one where his model didn't hit the wall. Round Two was more of the same, except that many more models hit the wall. Those who waited until after 4 PM to fly (and took a chance on not having time to fly) made the best time. Hans Beck showed us how to deal with the arch - his model rode the arch down, hooked the prop, dropped off into a tail slide and came on to a safe landing on the floor. Pandemonium reigned among the Hungarians and those who could understand Hungarian as the model passed the site record of over 29 minutes - and a big cheer went up for Hans as his model completed the first 30 minute flight of the meet. Bilgri had received a big hand earlier, as he steered his model flawlessly. It had been apparent even to the spectators that it was a difficult task superbly done. In fact, everyone whose model did a good time was applauded - the spectators were good for the morale!

Day Two. Everyone pushed a little harder in Rounds Three and Four, and more of the models went into the side. The best flights were made before 9:30 and after 3:30; Hans Beck repeated his kamakazi act on the arch for a new mark and top time of the meet. Besides being very lucky, Hans proved himself to be a very good flier. Collisions also happened in spite of the contest procedure which limited the flying to three models airborne at one time. Harri Raulio's model collided with Kurt Vogler's; each restarted, then it was Raulio and Gabrijel; on his third try Raulio made it. Later, Romak's model hung on the fin of Otto Hintz's model; again with no damage to either model. Jiri Kalina finally managed officially what his test flights had shown - his version of Carl Redlin's Challenger logged one of the five 30 minute flights of the meet. Manfred Koller was also proving to be a consistent flier, increasing his time on each flight.

Day Three. Round Five. By now, people were getting the measure of the drift and turbulence, only to be crossed up as the weather was alternately sunny and cloudy. The site was unusually sensitive to sunlight because of the beautiful stained glass roof and side windows - which accounted for the poor conditions during the middle of the day. Hans Beck did it again - his kamakazi act was apparently deliberate as it netted him another 32 minute flight - only his worried look and agitated manner told the story. It seems that Karl-Heinz Rieke had warned him to stay away from the arch!

Early in Round Six, Dagmar Chlubna (the first woman entrant in an Indoor Championship) launched her best flight, but it was really in danger most of the time. It went up and all around, including over the ledge of the third floor gallery. Finally, she steered it away from the ledge and almost didn't get the balloon loose. A few frantic seconds told the tale and this flight boosted the Czechs into fifth place. Round Six was harrowing for the Americans - Round Five had been disappointing with the Germans coming up to within two minutes of first and the Finns only 7½ minutes behind.

Hans Beck's last flight broke his lucky streak as he blasted it up to hangup; Vogler's last flight improved his time by only seven seconds; but Strattner's last one boosted the Germans into first by over six minutes. Bilgri's last flight was all-out, hoping to share in the Beck luck - no go. Romak's last flight was nearly to the top and perfectly centered; a "textbook" flight that increased his time by 3½ minutes. Now, only Cummings' last flight remained for our team. Frank's models had remained very sensitive to drift and his best previous flight had hit a balcony while still cruising well. The model had excellent potential but luck was against it. Frank was unable to risk an all-out flight - he had to play it safe. The model levelled out about 70' high in an orbit that another model had used successfully shortly before. A 24 minute flight would do it, but drift caught the model with just over 20 minutes on the clock. It was the time to steer, but the first attempt slightly worsened the position. The second (and last) attempt looked good, but somehow the model slipped away from the string without changing course. One more circle and it hit about 30' high. After an agonizing slide down the wall, the time was 45 seconds short of first place - and the 1966 Indoor World Championship was at an end.

The Victory Banquet was a gala affair and reflected the same careful planning which had characterized the whole meet. After the formalities, the air erupted with paper airplanes and other pleasant tomfoolery - the many firm friendships we all had formed made us wish it wasn't all over. This had been a record-breaking event from many standpoints, and the success of the meet was a fitting reward for the excellent planning and management by Rudi Beck and other members of the Central Aeroclub of Hungary. Erno Frigyes did well as the contest manager, and the International Jury consisting of Rudi Beck, Edwin Krill and Rudolf Cerny assured equal opportunity for all contestants. The only sour note of the whole affair was the failure of John Malkin's proxy entry to arrive. John reported later that he was notified indirectly that his entry fee had been paid; he was never formally notified that he was entered. Understandably, he didn't send the model without proper paperwork, and we will have to wait two more years to see if John can repeat his feat of sending a model over 12,000 miles safely.

Now, with a month of recollections to lean on, it can be said that the 1966 Indoor Championship has effectively revived interest in future Championships. Informal FAI meetings indicated strong sentiment in favor of changing the FAI model from 90 cm to 65 cm span, and that the provisional FAI ceiling categories should be adopted. It seems likely that both these actions will be accomplished at the November CIAM meeting; both changes should make indoor more popular in Europe. Now that it has been proved that a blimp hangar is not necessary, several more sites in Europe can be seriously considered. Never again should we have to fret and worry if the next event will be hosted or if enough people will enter - each successive Championship should be bigger and better!

INDOOR NATS RESULTS

Indoor Cabin

Junior

1.	Randy Richmond	7:26.0
2.	Ronnie Ganser	6:51.0
3.	Susan Weisenbach	4:05.0
4.	Michael Wood	3:25.0
5.	Bruce Paillet	3:00.4
6.	Barry Paillet	2:21.8
7.	Patrick Wood	1:49.0
8.	Thomas Mills	1:10.0

Senior

1.	David Erbach	9:45.0
2.	Louis Joyner	0:21.0
3.	Dennis Kargol	0:02.4
4.	Geoffrey Sauter	0:01.0

Open

1.	Al Rohrbaugh	17:51.2
2.	Charlie Sotich	16:30.6
3.	Ronald Ganser	15:18.8
4.	Jim Richmond	10:33.0
5.	Bill Bigge	10:30.4
6.	Walter Erbach	9:48.6
7.	Joe Matulis	3:52.0
8.	Dick Ganslen	2:13.2

Indoor HLG

Junior

1.	A. Markiewicz	1:46.1
2.	Randy Richmond	1:36.0
3.	Jim Thornberry	1:32.0
4.	Thomas Mills	1:22.2
5.	G. Neighbors	1:21.2
6.	Michael DeJaeger	1:17.8
7.	Allen Nixon	1:14.5
8.	Paul Hooper	0:56.5
9.	James Mills	0:53.1
10.	Daniel Frick	0:48.9

Senior

1.	Dennis Kargol	1:57.8
2.	Henry Nixon	1:23.2
3.	Louis Joyner	1:21.8
4.	Billy Haught	1:20.0
5.	John Manczuk	1:16.6

Open

1.	Robert Watson	2:01.2
2.	Bernard Boehm	1:53.3
3.	Bob Larsh	1:50.8
4.	Ron Higgs	1:49.6
5.	Larry Miller	1:48.6
6.	Bob Sifleet	1:48.2
7.	Phil Klintworth	1:46.6
8.	Jim Richmond	1:45.4
9.	Donald Reed	1:39.4
10.	Glenn Lee	1:37.8

Indoor Stick

Junior

1.	Randy Richmond	14:39.6
2.	Linda Randolph	14:35.4
3.	Ronnie Ganser	13:51.8
4.	Jim Thornberry	13:31.0
5.	A. Markiewicz	12:15.0
6.	Kristi Tenny	8:25.8
7.	William Schlarb	5:19.3
8.	Susan Weisenbach	4:11.8

Senior

1.	David Erbach	18:08.2
2.	Billy Haught	13:42.2
3.	Dennis Kargol	13:24.2
4.	Tim Von York	12:04.5
5.	Geoffrey Sauter	10:45.0

Open

1.	Bob Randolph	27:26.6
2.	Charlie Sotich	23:03.8
3.	Ed Stoll	21:46.8
4.	Curtis Janke	19:57.2
5.	Phil Klintworth	19:42.2
6.	Chuck Wiechard	19:33.2
7.	Al Rohrbaugh	19:15.0
8.	Gerald Skrjanc	19:10.4
9.	Bud Tenny	18:37.8
10.	C. V. Russo	17:06.6

Paper Stick

Junior

1.	Randy Richmond	14:47.2
2.	Linda Randolph	13:35.0
3.	Jim Thornberry	13:03.6
4.	Ronnie Ganser	10:28.2
5.	Susan Weisenbach	7:26.6
6.	Patrick Wood	6:51.4
7.	William Schlarb	6:11.0
8.	Allen Nixon	5:46.0
9.	Barry Paillet	4:19.4
10.	Bruce Paillet	4:18.0

Senior

1.	David Erbach	9:15.0
2.	Tim Vom York	8:19.2
3.	Henry Nixon, Jr.	6:04.2
4.	Geoffrey Sauter	5:58.2
5.	Dennis Kargol	3:33.0

Open

1.	Ed Stoll	18:27.0
2.	Bob Randolph	17:25.8
3.	Phil Klintworth	16:20.0
4.	Hardy Brodersen	15:30.0
5.	Bob Yurkowski	14:30.4
6.	Wally Mumper	14:20.4
7.	Jim Richmond	14:03.2
8.	Al Rohrbaugh	13:50.0
9.	Charlie Sotich	12:49.0
10.	Ed Collins	11:24.4

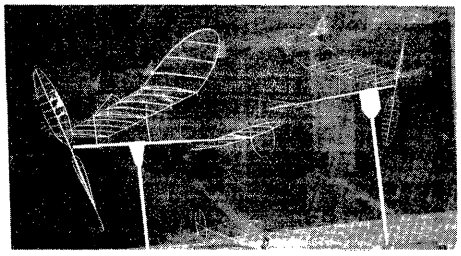
INDOOR WORLD CHAMPIONSHIP
Photos by Bud Tenny and Manfred Koller

Teodor Strasberger - Yugoslavia

Zoltan Oscodi - Hungary

Josef Gabris - Czechoslovakia

Liri Kalina - Czechoslovakia



Model by Romak (l.) and Bilgri (r.)

Hans Beck (l.) and Kurt Vogler (r.)
(Germany)

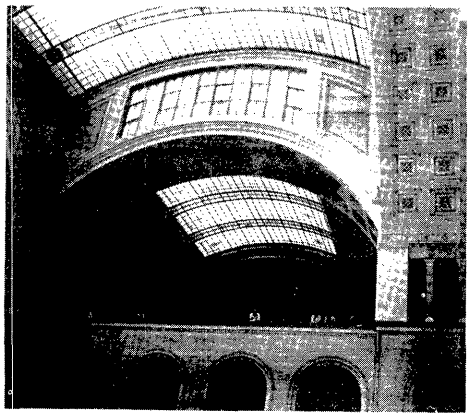
Esko Hamalainen and
Reino Hyvarinen - Finland

The U. S. Team and Interpretor - (l. to r.):
Bud Tenny, Ester Lsigo, Bud Romak, Joe Bilgri, Frank Cummings

Manfred Koller - Austria

Dagmar Chlubna - Czechoslovakia

Reino Hyvarinen makes a flight.
(Note flags in background)



The Site - And Three Arches

The 1966 Indoor Nats

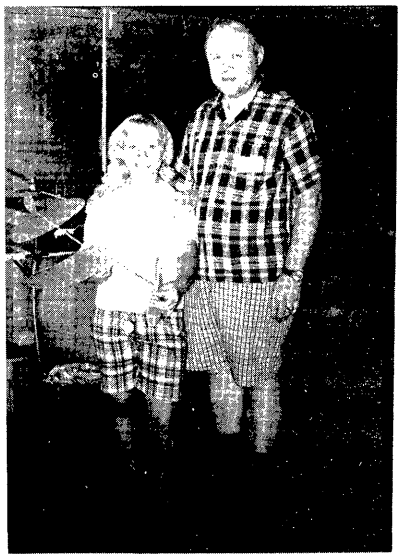
The 1966 Indoor Nats, held in the International Amphitheatre in Chicago, appeared to surpass the the last two Indoor Nats, at least from the competition angle. Only one trophy went unclaimed, compared with seven in 1965 and ten in 1964. It was particularly pleasing to note the spirited competition in Junior Cabin, which had over twice as many entries as in 1965. Randy Richmond almost repeated his 1965 clean sweep of the Junior events, but Arthur Markiewicz pulled ahead in their two-year feud in IHLG. Linda Randolph is a rising star in the rubber events, with several records to add to the Nats trophies she now owns.

The increase in Junior Cabin activity can be partly credited to the ideas from Lloyd Wood (Oct. '65 INAV) on simplified cabin models for Juniors. In fact, Lloyd's sons, Patrick and Michael, were two of the newcomers, and Bruce and Barry Paillet were two more who used the simplified models.

Besides the simplified cabin models, other departures from normal practice appeared: Bob Yurkowski's V-tailed paper ship, Jim Richmond's cabin with built-up landing gear strut and built-up rear spar which formed a "fence", and Hardy Brodersen's water-shrunk paper job (slack removed with tiny drops of water) were noted.

The Amphitheatre had high humidity and high temperatures in addition to the well-known speakers and some invisible-but-very-real wires which hung down from the roof. Bob Randolph clearly outclassed the other Stick fliers (he has been practicing at Lakehurst and the Akron Goodyear hangar), but the rest of the competition was quite close. There were many collisions, particularly in the aerly hours of rubber; the Tenny family's two entries managed to account for three of these. Actually, after the Kossuth University site (seeWorld Champs report), the Amphitheatre seemed huge.

The glider fliers worked very hard on their times and times were good; somehow, we have never seen the equal of Tommy Neumann's 1:05.5 and Otto Heithecker's 1:05 (times from the '62 Chicago Nats) in either of the Cat. II Nats since. Our own observation of HLG was limited; all our test flights and official flights were made in 25 minutes. This must be some kind of record in itself, or an exercise in futility if you examine the resulting times. However, this is what happens when you combine a 150 mile dash with a classic Chicago traffic jam!

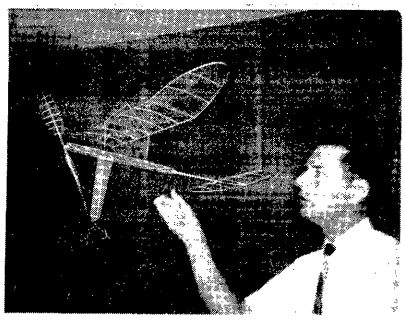


Father-Daughter Team
Linda and Bob Randolph

Bruce Paillet winds his Cabin Model
Exploding flashbulb shatters nerves but not model!

Patrick Wood - Jr. Cabin

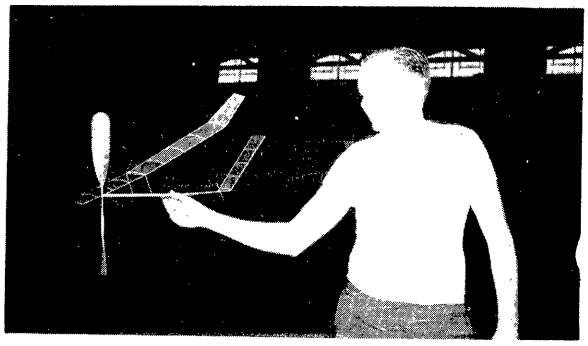
Family Team
Clarence Mills; Sylvia and Clarence, Jr.



Jim Richmond and Cabin

Ron Ganser and Scale Model

Paul Crowley winds for
Phil Klintworth

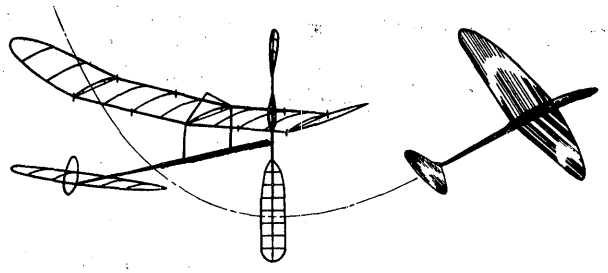


Bob Yurkowski and V-tail Paper Stick

SPECIAL NOTICE! LABOR DAY SESSION AT LAKEHURST; C. V. RUSSO, 143 Willow Way, Clark, N.J. 07066

The Voice of N.I.M.A.S. OCT 1966

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

AMA Election

At the time this is being written, the AMA ballots and slate of officers have not been received. The deadline for returning this ballot will be Nov. 15, 1966. It is very important that every AMA member return his ballot on time - so important that every model club should hold a special meeting if necessary to discuss the ballot and encourage each member to vote. Club leaders should share their knowledge of the nominees and counsel the members in order to obtain the best District leadership. In past years, approximately 15% of the AMA membership returned their ballots. Do you want your district officers elected by 15% of your district membership?

Sponsored Junior Memberships

This is a reminder to all NIMAS members that several sponsored junior memberships are available for deserving juniors who show unusual interest and/or skill in indoor events. Candidates can be nominated by any NIMAS member or by AMA Chartered Clubs. The membership is a full voting membership in NIMAS, and costs the candidate $1 for the first year and regular rates thereafter. For other details drop a line to Box 545, Richardson, Tex. 75080.

Family Memberships

In Feb. '66 NIMAS Family Memberships were opened up and a good many youngsters were enrolled under this plan. The cost is 50¢ per member under 21, with the entire family sharing one issue of INAV. This entitles the other fliers in the family to become eligible for NIMAS Awards and other NIMAS benefits reserved for members.

Recent Publications

Your attention is directed to the Nov. '66 M.A.N., which has excellent picture coverage of the Indoor Nats by Harry Harps and an interesting report by Dick Black. Dick's VTO column also carries a brief report on the 1966 Indoor World Championship. A vote of thanks to M.A.N. and their staff for this coverage!

S.A.M.M.

A new magazine has arrived on the scene - Sig Air-Modeler Magazine or SAMM for short. This magazine is aimed at the sport and beginner flier and is published bi-monthly. The first two issues were quite good, and there is much promise to look forward to. The editor is Larry Conover, but this FF background doesn't necessarily mean SAMM is a FF magazine. The Aug./Sept. issue has a Nats report, an Al Vela FF, a rubber scale type model, a 1/2A Combat ship, a catapult glider and an article on prop carving to name a few features.

NIMAS Awards

Gold Cat. II Rubber Award - 27:13, Manfred Koller

Manfred is the first of our honorary members to take advantage of the availability of NIMAS Awards to those in other countries (outside the limits of North America). All other honorary NIMAS members may do likewise; if the flight in question was not part of a well publicized meet, please inquire about verification of the time.

New Materials!

For indoor scale builders, a new dope is available which may save some warped surfaces if you like to dope your pretty birds for more durability. It is SIG Lite-Cote, a non-tautening (actually, low shrink) butyrate dope. It fills well and handles beautifully, and seems to be quite stable. In fact, it may be an excellent base for microfilm, requiring only the addition of certain solvents to tailor the pouring characteristics. This aspect will be well checked out before final comment is made, but this product deserves a good investigation.

FAI INDOOR REPORT

An Innovation!

The Team Selection Program which will be used to choose the 1968 FAI Indoor Team has been approved. The entire program will be published in the Nov. '66 INAV and in the Dec./Jan. A.M. (out early in Dec. '66); but one aspect of the program is new and will be explained here. First, the Local Qualification Trials can be held anytime between Jan. 1, 1967 and April 30, 1967; an unlimited number of trials can be held in each Zone and locality. In addition, a flier may qualify at any sanctioned AMA indoor contest, provided he scores at least 75% of the winning time for that contest, and provided that his model meets the specifications for FAI Indoor Models. The procedure for entry is then changed: A contestant will pre-register by remitting a $2 qualification fee. (Both his AMA license and FAI Stamp must be current). He will receive a special entry form which he will fill out and have certified (flight performance and model specs) by the meet CD. This form will then be returned by the contestant to HQ and he will then receive a notice of qualification which permits entry in the Quarter Final.

Meanwhile, contestants at Local Qualification Trials will pay $1.50 entry fee at the first Trials. Those who qualify will receive notice of qualification from HQ as above; those who do not qualify will be sent the special entry form as above. These contestants are then able to enter subsequent Local Qualification Trials or AMA contests to try again - until they qualify or give up.

INDOOR RULES

Two rules proposals have just been received by the Free Flight Contest Board for a special one-vote action. The special action was approved by the Executive Director of AMA (John Worth) and by the Chairman of each Contest Board and by Ron St. Jean, Contest Board Coordinator.

The first proposal, FF-66-B-1, is the Easy B proposal as detailed in the April '65 INAV, and would create an Easy B class as a beginner class with no record. This is in line with the results from the Indoor Rules Questionaire circulated in the May '64 MODEL AVIATION.

The second proposal, FF-66-C-1, would reduce the required attendance at Indoor Record Trials to 5 fliers in Cat. I and 8 fliers in Cat. II. This matter has been mentioned very often in recent correspondence, so a great number of you favor it.

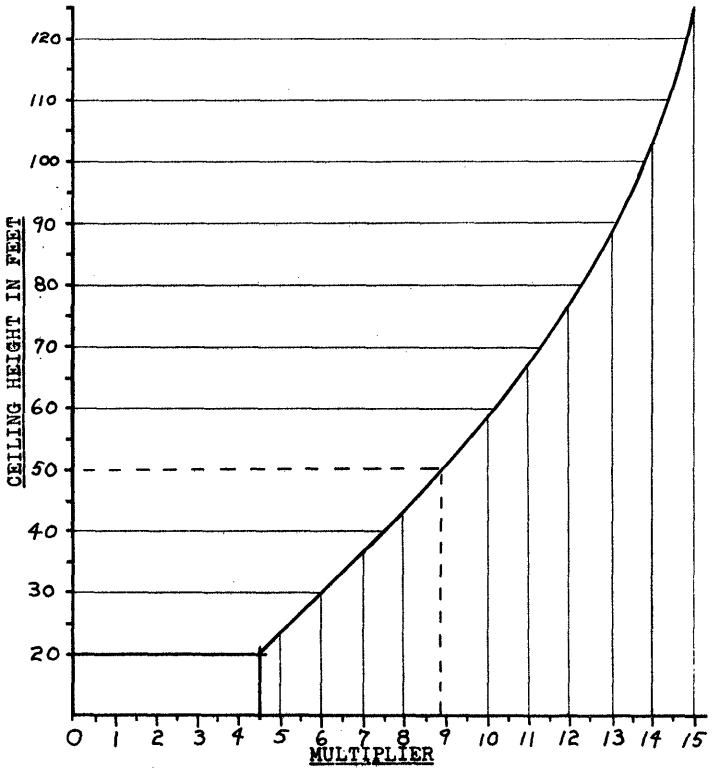
If you favor these proposals (or do not like them), contact your Dist. member of the FFCB and tell him how you would like for him to vote. It is important that you respond immediately, since the voting deadline is Nov. 1, 1966. If these pass on a one-vote deal, they are to be included in the 1967 Rule Book.

POSTAL CONTESTS!

HLG Fudge Factor

In response to a suggestion last spring by Jim Richmond, the graph below was constructed to give a better fudge factor than had been used before for HLG postal meets between sites which differ greatly in height. The chart is used thus: Locate the ceiling height of each site on the left side of the chart, read across to the curve and straight down to get the ceiling multiplier for each site. Divide the lower number into the higher and

multiply the times from the lower site by the result. For example: 20' site vs. 50' site; the multiplier for a 20' site is 4.5 and for a 50' site it is 8.9. 8.9/4.5 = 1.97. A 22 sec. flight in the lower site = a 43.5 sec. flight in the higher site. (0:22 x 1.97 = 0:43.5)



POSTAL CHALLENGERS

The Brainbusters Club of Hampton, Va., wishes to try some postal meets with a different twist. Their club has just a few fliers right now, and a great variety of different model types. Thus it is hard for them to set up a postal meet for any particular model type; and they feel that other clubs might be in similar shape. So, their idea is to combine the record challenge idea used by the Baltimore Aero-Craftsmen with a postal meet. The Baltimore club contest permits each flier to fly a model type of his choice against the record for the ceiling height. The flier who logs the highest percentage of his record wins the meet.

When you crank in the postal meet fudge factor, it comes out this way: Each flier makes his flight and uses a fudge factor between his site and the ceiling category limit (35' for Cat. I and 100' for Cat. II). This is multiplied by his time to get a score; the score is then compared to the record for that model type and ceiling category and the flier with the highest % score wins.

Example I: 20' site, B Stick, 9:48. Fudge factor = $\sqrt{35'/20'}$ = 1.32. 9:48 x 1.32 = 12:55. Cat. I B Stick Open record = 14:09. 12:55/14:09 = .914 or 91.4%

Example II: 65' site, C Cabin, 13:45. Fudge factor = $\sqrt{100'/65'}$ = 1.24. 13:45 x 1.24 = 17:03. Cat. II Open C Cabin record = 17:54.8. 17:03/17:54.8 = .95 or 95%

In the examples above, the C Cabin in a 65' site beat the B Stick in a 20' site, but by a very close margin. In spite of the extra "numbers", I plan to try this type of postal meet against the Brainbusters. How about you, Tom Vallee and Charlie Sotich? Contact the Brainbusters via Hal Crane, 4002 Buchanan Dr., Hampton, Va. 23369.

QUESTIONS AND ANSWERS

36. Recently, a model without wing offset was trimmed well for low power. When it was wound up tighter, it stalled. The cure which worked was to add washin in the inboard wing - this resulted in a smooth climb under high power. Why should a model stall because of lack of torque control?

Essentially, the above is a loaded question in that several probably essential factors are missing. The idea here is to use this question as a springboard for general discussion on the proper trim of a model in the burst. Another example, which may be the opposite of the above, concerns a model (my own) which showed very good cruise trim and excellent climb under about 60% turns. The prop blade area was smaller than usual practice for hangar flying, and the outline was symmetrical about the spar with a fairly stiff spar. The climb angle was smooth and similar to lower power flights, but the prop RPM went up without a noticeable increase in climb speed. Two possible explanations occur: Either the prop washed out some way, permitting an RPM increase, or the model was underelevated for the power condition which permitted the RPM to increase during the flatter climb. The possibility of bending stick was supposedly taken care of by a tight monowire fuselage brace - in fact, the stick was reverse bowed when the poor climb rate was noticed.

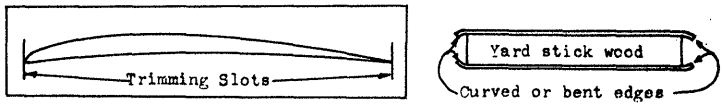
I'm sure that all Cat. I and Cat. II fliers would benefit from a discussion on trim for climb in high ceilings, especially since the next Nats will be in a hangar! What do you look for, and how much advance trimming can be done (in a lower site) before arriving at the hangar?

HINTS AND KINKS

Two By Pfeiffer

Ted Pfeiffer suggests that the yardstick give-aways from the lumberyard make excellent sanding blocks. Use a good grade of wet-or-dry sandpaper and fasten it to the stick with contact cement or Pliobond. Two different grades of paper can be used - one on each side of the stick. Note in the sketch below that the edges of the sandpaper are curled up slightly so the sanding block won't dig into the wood.

Ted's specialty is Indoor Scale, and many of these models have very thin wings. A standard male rib template has very little "holding space", so Ted suggests that a female template like that sketched below has a lot of space to hold it down. Note the trimming slots at the ends of the template - these are necessary to completely cut the wood loose at each end.



FEMALE TEMPLATE

A LOOK AT YESTERYEAR

This glimpse into the past shows details of a model flown in a model class no longer in the AMA Rule Book - Class B ROW. (See page 3) Features on this model which are no longer in use include the teardrop motorstick, a carved balsa prop (a few are still around) and cantilever wings mounted on wing clips. This wing mounting method allowed the wing to be moved fore and aft, but retained the same angle of incidence. Thanks to Model Airplane News for permission to reproduce this - both the page number and date appear on the plan. By the way, just when was this event dropped from the AMA event listing?

HEY CHARLIE! YOU EVER SEEN AN INDOOR MODEL?

BRACING TECHNIQUES

Part III - Wing Bracing Jigs

Parts I and II dealt with where, why and how the wire bracing is applied to wings. Some means is needed to get the wing aligned and hold it there while bracing it. In Fig. 1 is presented the Bilgri bracing jig, which is the most popular jig type presently used. (Fig. 1 by courtesy of Model Airplane News). Several items of interest and practice are worthy of note. Preplanned adjustments such as washin were built in on the jig. The dihedral props are tack-glued in place after the wing is placed on the jig and the spars cut for the dihedral. When the wing is first placed on the jig, the end of each dihedral compression rib is tack-glued to the form so the wing is held stationary during the bracing operation. Some builders have made small clamps to hold the wing on, like the one in Fig. 2. After the wing is fastened down and the dihedral installed, the rest of the bracing job can be completed.

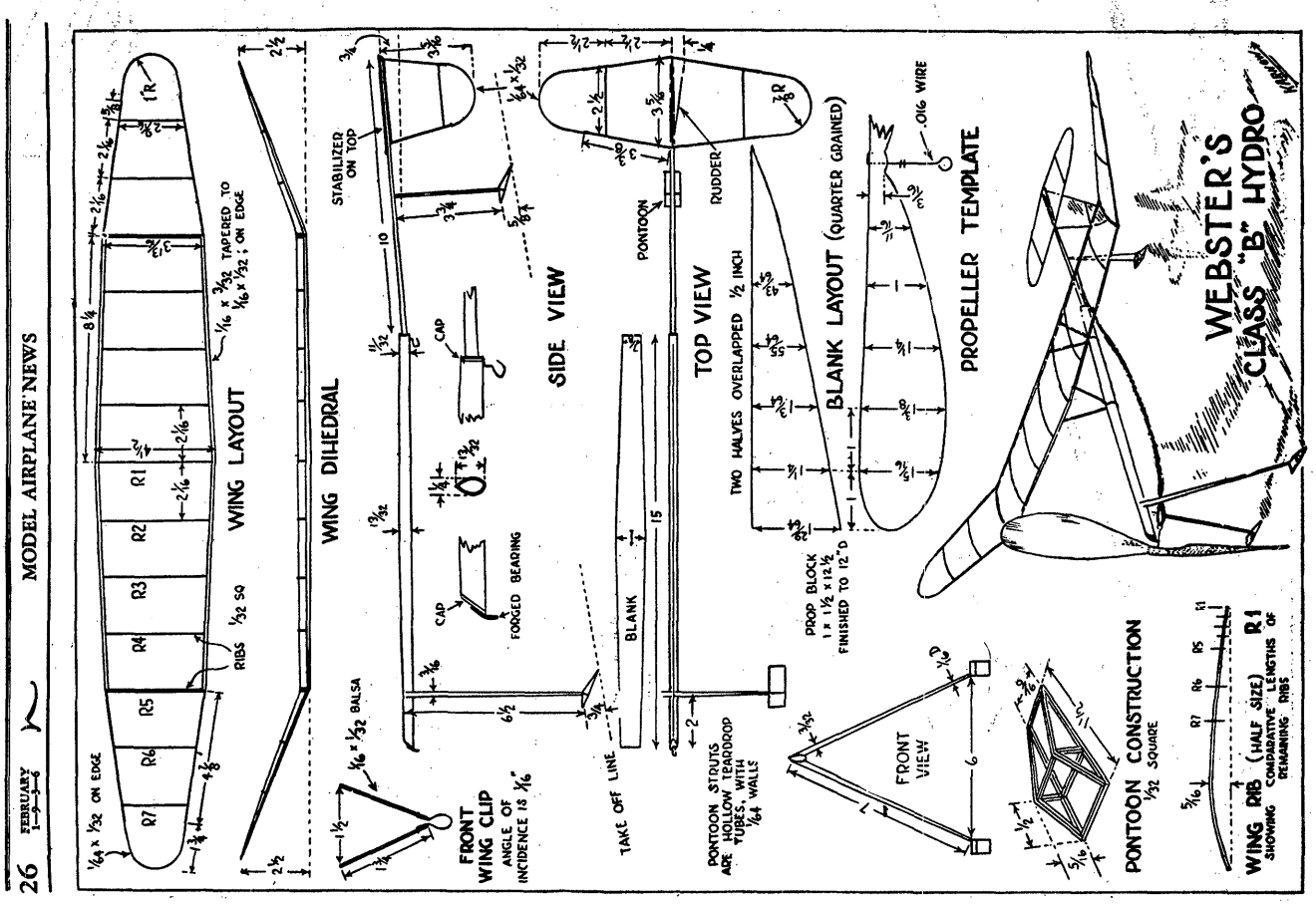
Fig. 3 shows the bracing jig used by Joe Hindes for bracing an elliptical or stressed dihedral wing. Note that the basic form can be the same as the Bilgri jig, and that there are several dihedral props. The outer dihedral braces are left shorter than is needed to hold the wing to the finished dihedral, and the tip bracing wires are tightened just before removing the wing from the jig. This places the spars under just enough added tension to insure a rigid wing.

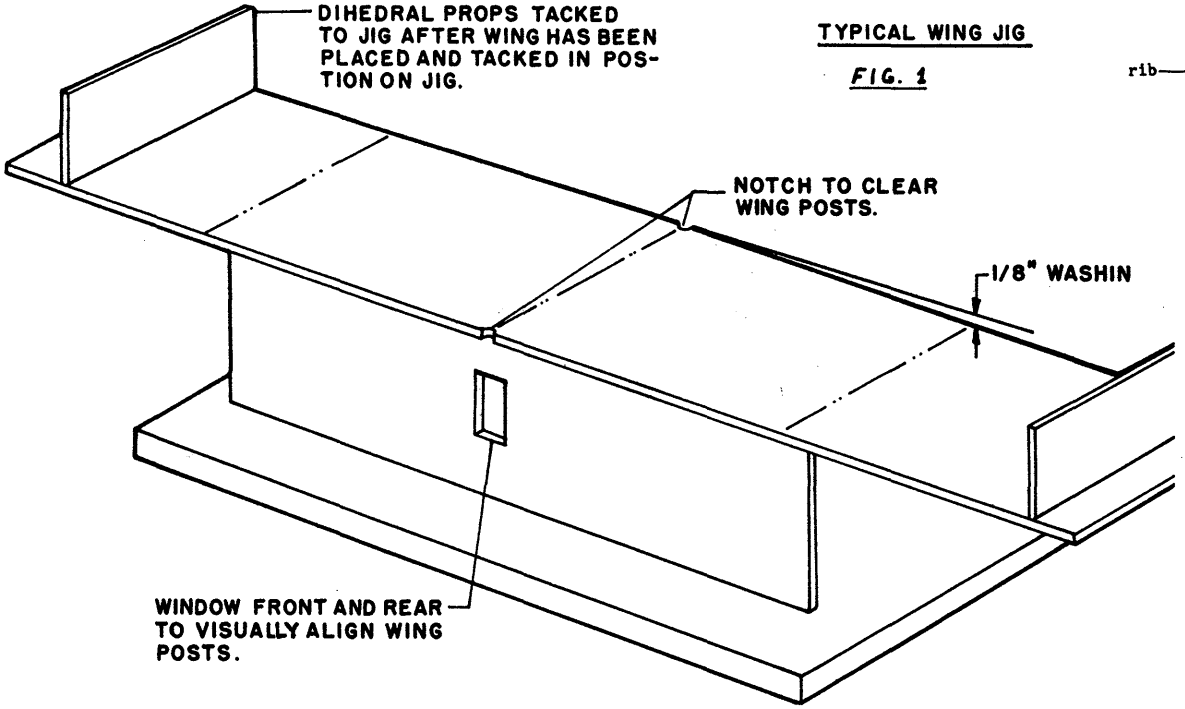
The major disadvantages to using regular bracing jigs are that each jig will fit only wings with the same chord as the wing it was made for, storage is a problem in that the jigs are somewhat fragile and they take a lot of room, and they are almost impossible to transport safely. The system used by Ray Harlan does not use a fixed jig, and it is possible to make certain small accessories which approximate a complete jig that can be packed in a small area. At the same time, one set of fixtures will fit all wing sizes and shapes of wings and any smooth, flat area is suitable to use for bracing.

The essential idea behind the Harlan method is to use two tissue sockets properly spaced to support the wing posts; assemble the wing to the posts and brace it - all out "in the air" with removable supports to align the wing and support it during the bracing operation. The following is my adaption of the Harlan method: To support the wing posts I use the wing storage jig (Fig. 4) which is taped or pinned to the work surface. The wing posts are then inserted in the sockets and the cabane is glued to the top of the posts. The covered wing is then inserted between the posts and supported with adjustable supports (see Fig. 5 for supports and Fig. 6 for layout of this step). The support jigs are made large enough to fit the widest wing you will cover - perhaps 7½" between the wire posts and let the posts be 8" tall. After the support jigs are fastened to the work surface, set them to the proper height to support the wing while glueing it to the posts. When the glue is dry, move the supports out to the dihedral ribs and install the primary bracing. Finally, move the supports to the wing tips to hold the dihedral while the dihedral joints are drying (see Fig. 7 and Fig. 8). Elliptical dihedral could be installed by using several sets of supports (see Fig. 9).

No matter what type of jig you use, if it is mounted on a turntable or moveable object (or a coffee table you can work around), easy access to both sides of the jig greatly speeds the work. Also, if the light is specially arranged to suit the bracing material, visibility will be greatly increased. For example, the light should be from behind you and the work facing a dark background if you use wire bracing; with dacron the light source should not be bright but should come from the opposite side of the work so the dacron is between you and the light.

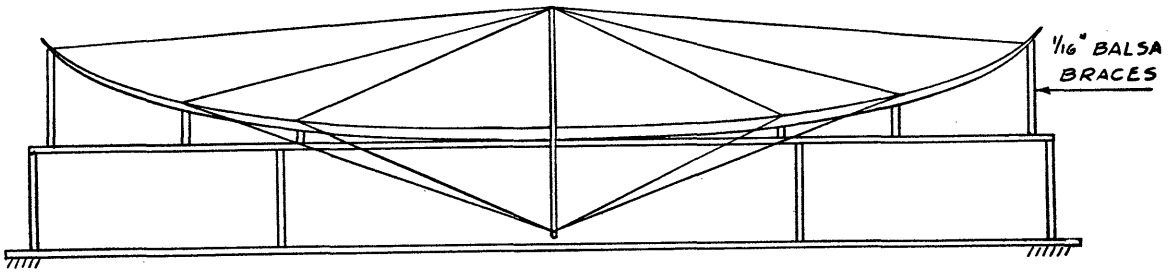
Readers are again reminded that comments and suggestions on this series are encouraged; also questions about anything not made clear or about items not covered. It is likely that bracing for other components besides the wing will be covered in the next installment.





TYPICAL WING JIG

FIG. 1



RIGGING FRAME MADE FROM 1/4" PLYWOOD. EDGES SHOULD BE VERY SMOOTH.

FIG. 3

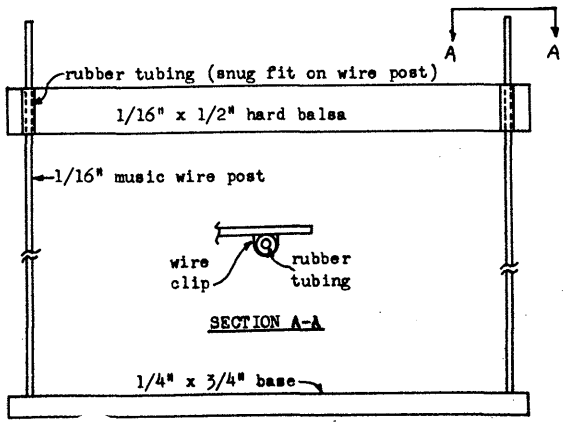


FIG. 5

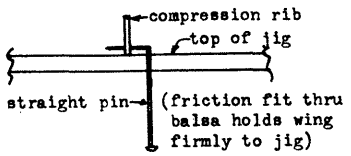
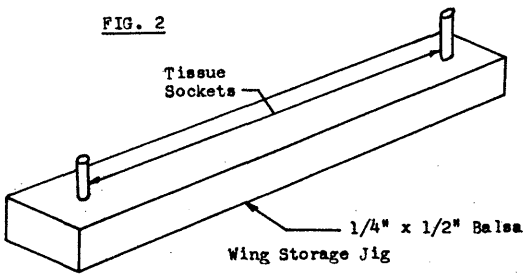
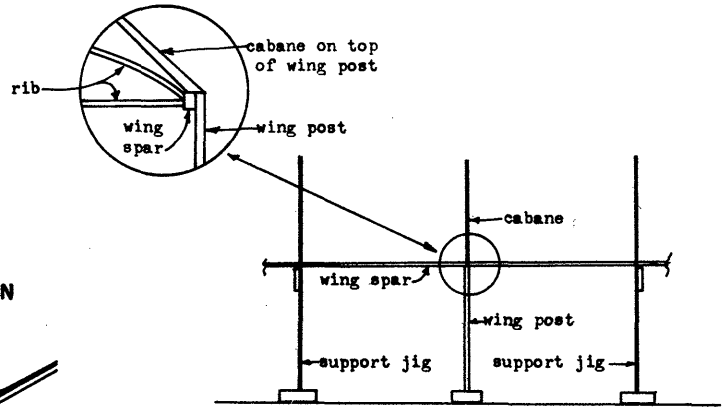


FIG. 2

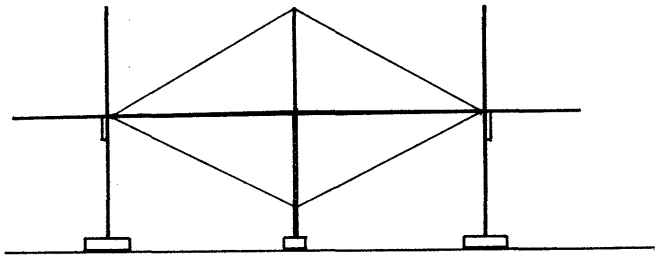


Wing Storage Jig



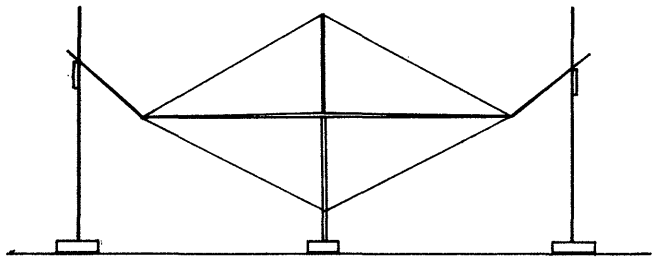
Step one - wing to post/cabane

FIG. 6



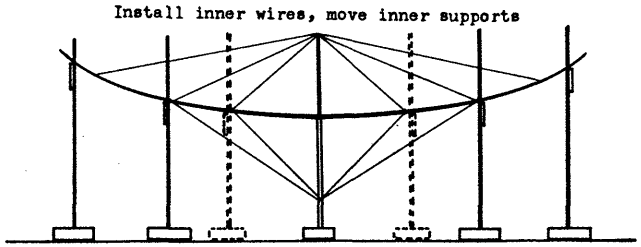
Step two - Add bracing

FIG. 7



Step three - add dihedral

FIG. 8



Elliptical dihedral w/demountable jig

FIG. 9

Canadian Flyers Endorse Manhattan Formula

One of the most interesting indoor groups is at the RCAF Station at Gypsumville, Manitoba. With good support from top brass, they have the use of a large gym one night a week from fall thru spring, [illegible]ch that far north starts early and ends late. In return they run [illegible] contests for the Station's Cub Pack each session before starting their own flying.

Due to transfers from the unit, they keep losing members and must constantly recruit new ones mostly new to indoor flying. Under the patient guidance of Richard Percy they have found the Manhattan Formula (basically a 20" wingspan, full-cabin ROG model weighing .3 oz. minimum described in Nov. 1965 INAV)very satisfactory in introducing indoor flying to outdoor modelers and to the complete beginner. Percy calls it "a simple,straight forward approach to indoor cabin, where newest indoor flyers can expect relatively good success compared to other cabin classes".

Due to high cost of USA supplies, models are heavier than the minimum. For rubber they use old golf ball windings, stretched and soaked in glycerin. Despite such handicaps they do very well; and in a very informal postal meet compared their best times so far with Ed Whitten's flights at Lakehurst July 3rd. Results: Percy's "Plata Puss Duck" 1:47, Pete Dyck 1:34, Whitten's "Riversider" 1:24.5. With developement this style of model is definitely capable of much more, as indicated that day at Lakehurst by Fred Weitzel flying an exact scale P-51 for 1:04.

Percy finds the Manhattan "a refreshing change and a challenge" and "a very enjoyable and rewarding model to fly", concluding that he "hopes other groups give it a bash because they are missing something if not".

If you have tried this event, or are thinking about doing so, or have any comments on the rules, please write to Bud Tenny so that ideas can be exchanged.

Lakehurst Trials September 4-5

East Coast flyers want to thank the Navy for continued use of Hangar 6 at Lakehurst. Labor Day flying resulted in a good list of high times, including two possible Category III autogiro records, applications for which are being made to AMA headquarters:

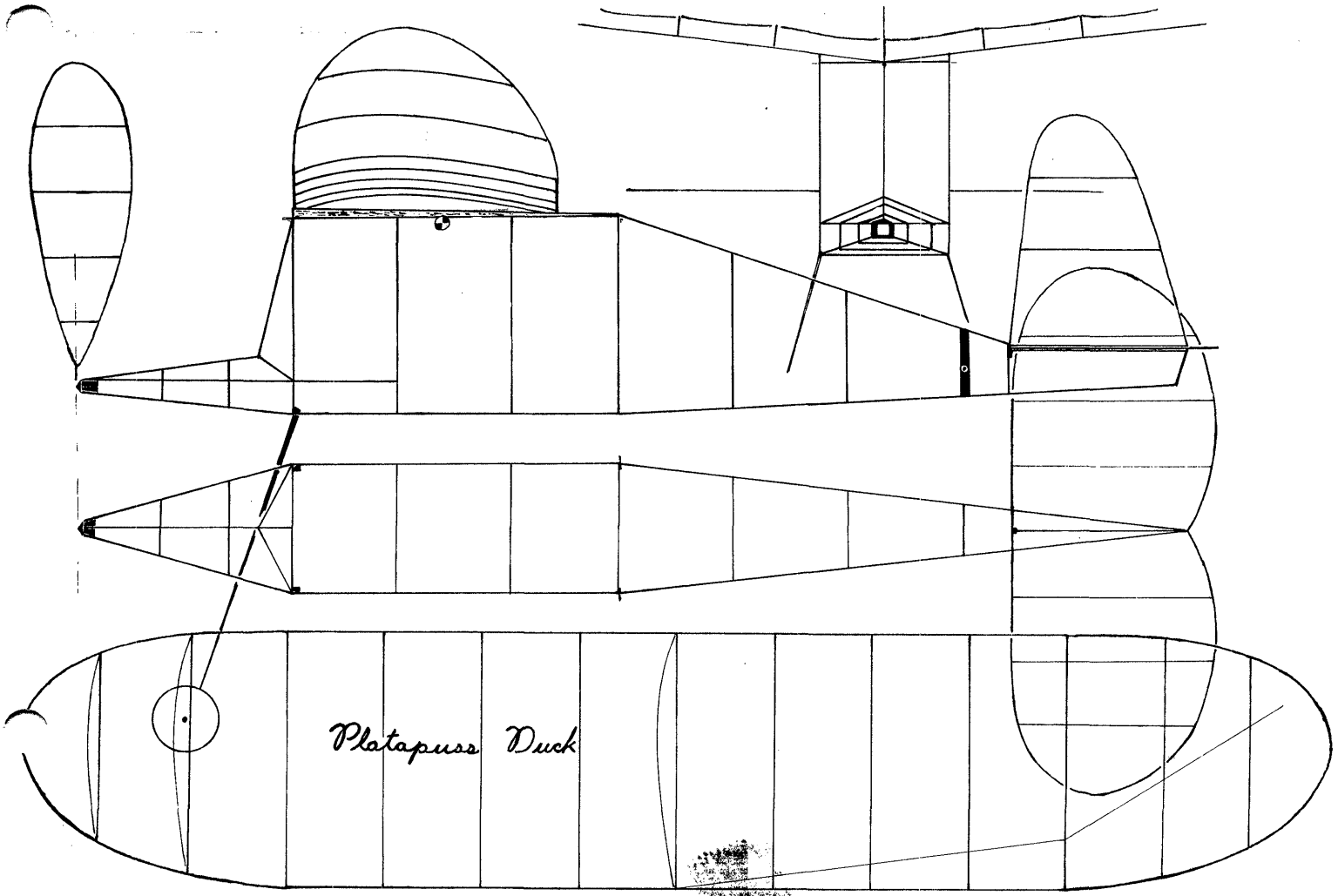
Senior - David Erbach - 5:27.5
Open - John Triolo - 8:08.0

Recorded individual single flight times:

John Triolo	34:22.5	FAI
Bob Champine	31:41	"
C. V. Russo	29:56	"
Tom Vallee	29:21.6	"
Jim Vale	27:00	"
Harold Crane	25:52	"
Chuck Wiechard	25:09	"
C. V. Russo	32:15	Mic Stick D
Pete Andrews	33:33	Mic Stick B
Bob Champine	12:30	Mic Cabin C
Pete Andrews	20:37	Paper Stick
Ed Whitten	2:47.7	Manhattan Formula

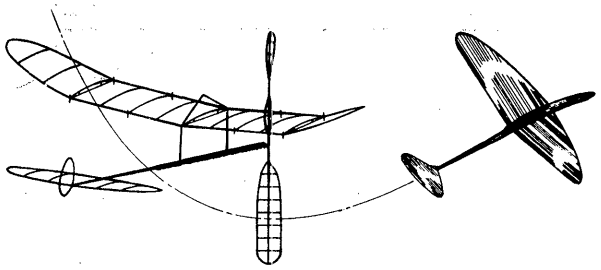
The Wee Juniors did well with Stephen Ch Champine (age 9) doing 9:10 in Mic Stick "B" and Richard Whitten (age 7) 3:37.5 in Paper Stick.

Walt Erbach flew helicopter and autogiro; and Dave Martin, Manny Radoff, Ernie Kopecky and others flew FAI and Paper, but did not turn in times that even included several 30 minute flights. Don Bal made over one minute in HLG, and Ed Franklin put frosting on the cake flying his exact replica of the 1928 indoor stick record holder.



The Voice of N.I.M.A.S. NOV·1966

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

CHRIS BORLAND, 2221 V Street, Apt. H, Sacramento, Cal. 95818
DAVE GEORGE, 453 Tomahawk, Park Forest, Ill. 60466
ROBERT LOCKWOOD, Distribuidora de Impresos, S.A., Mariano Escobedo no. 218, Mexico 17, D.F., Mexico
ED MYERS, Chula Vista Jr. High, 415 Fifth Ave., Chula Vista, Cal. 92010

Family Members

LINDA RANDOLPH, 5785 Forest Ridge Dr., N. Olmsted, Ohio
RANDY RICHMOND, 131 Pamela Dr., Bensenville, Ill. 60106

Change of Address

The following NIMAS members have moved; if you are planning to contact them, note the new addresses:

DICK BLACK, 3115 Wright Court, Denver Colo. 80215
RAY HARLAN, 15 Happy Hollow Rd., Wayland, Mass. 01778

In the future, any NIMAS members who move may have the option of requesting a similar announcement. It will not be automatic; if you wish your new address published, please say so. This is in keeping with the habit NIMAS members have of keeping touch with each other; one of our strengths is the interchange of information which results.

Also, NIMAS members who send a stamped, addressed envelope will receive a copy of the NIMAS mailing list. It has recently been updated and should be complete.

NIMAS Awards

Gold Cat. II HLG Award - 0:55, Ron Higgs

Financial Report

Indoor News And Views begins the sixth year of publication with this issue. The average circulation for the past year was 214 (up about 5% from 1965), and the circulation to fliers in other countries jumped from 15 to 22 since the 1966 Indoor Championship. Incoming mail totalled 549 and outgoing totalled 815 items; both these are down slightly from last year. Income/outgo:

Income (memberships, subscriptions & donations) $545.00

Printing costs (INAV only)	$249.04	
Postage (INAV only)	141.43	
Postage (correspondence & services)	86.95	
Office supplies and photo processing	30.90	
	$508.32	508.32
Average labor per issue = 65 hours.		+ 36.68

FAI INDOOR REPORT

Report From CIAM Meeting

The future of Indoor is looking much brighter as a result of decisions made at the CIAM meeting in Paris, France, Nov. 2-4, 1966. First, the wingspan for FAI Indoor models was reduced from 90 cm to 65 cm by a vote of 13-2. The U. S. had offered a compromise of 75 cm as a result of the questionaire circulated by the FAI Indoor Committee, and Finland wanted 70 cm. This change will be in effect at the 1968 Indoor Championship, and thus the U. S. Team Selection Program (see below) will be conducted using 65 cm models.

The location for the 1968 Indoor Championship is tentatively the Palace de Sport in Rome, Italy. This site is 35 m high and 50 m in diameter. It is the site of the Italian Nationals indoor meet (does anyone have addresses of Italian indoor or FF fliers?) and is to be the site of an international indoor meet in 1967. The outcome of this contest will determine final CIAM approval of the site for the Championship.

Finally, the provisional ceiling categories adopted in 1965 were approved. It will be possible to establish international records in four FAI categories in 1967: Cat. I - 8 m (26.5'); Cat. II - 15 m (49.2'); Cat. III - 30 m (98') and Cat. IV - Over 30 m.

These changes should greatly increase the indoor flying in Europe, and the future of the Indoor Championship seems assured. In addition to the Italian invitational contest, the Czechs are planning several contests; we may find the tables turned soon with regard to activity. In past years the only indoor activity was in the U. S. and now the emphasis is shifting to Europe.

The Team Selection Program

Local Qualification Trials

1. An unlimited number of local Qualification Trials may be held in each zone, between Jan. 1, 1967 and Apr. 30, 1967. Each Trials shall be sanctioned through normal channels as for AMA contests and have a minimum of four entrants who hold a current AMA membership card with FAI stamp. Each contestant may enter any or all the local Qualification Trials in his Zone. FAI Rules shall apply at each Trials, except that "rounds" need not be flown. The top 80% of the entrants at each Trials shall qualify for entry in the Zone Quarter Finals.
2. A contestant at a regular sanctioned AMA indoor contest may qualify by scoring at least 75% of the winning time for that contest. Same AMA membership and FAI Stamp requirements as above. Model flown in the contest must qualify for FAI Indoor (span must not exceed 65 cm.).
3. Entry:
   a. A contestant who wishes to qualify at a regular sanctioned AMA indoor contest must preregister via AMA HQ by remitting a $2 qualification fee, in return for which he will receive a special entry form. The contestant must then fill out the form, obtain the meet CD's signature to signify that the information is correct, then mail the form back to HQ.
   b. A contestant who wishes to qualify at a local qualification trial will pay an entry fee of $1.50 at the first trials. Upon receipt by HQ of the contest report from the Trials CD, with fees, those contestants who did not qualify will be forwarded a special entry form as per (a.) above.
   c. Those who qualify by either (a.) or (b.) above will receive a notice of qualification, certifying eligibility for the Quarter Finals.
   d. Those with a special entry form from HQ may attempt to qualify at either local qualification trials or regular sanctioned AMA Indoor contests, without further payment of qualification fees for local qualification.

Quarter Final Qualification Trials

Quarter Final Trials may be held in any ceiling height, and must be completed by May 31, 1967. FAI Rules shall apply, except that rounds need not be flown. All qualifiers from local Qualification Trials may enter one, and only one Quarter Final Trial. Top 80% of entry qualify for entry in a Semi-Final. Entry fees: Jr. & Sr. - $1, Open - $2.

Semi-Final Qualification Trials

Semi-Finals will be scheduled one per zone only, entry fee - $5 per entrant, and must be completed by June 30, 1967. Any ceiling height may be used, and full FAI

Rules will apply, including the use of rounds. Qualifiers from any Quarter Finals may enter any Semi-Final, but only one Semi-Final. The top three (3) from each Semi-Final shall qualify for entry in the Finals; if less than 5 enter any Semi-Final, the top 50% will qualify for the Finals.

Team Selection Finals

The Finals shall be flown during the week of the 1967 Nationals, with FAI rules to be strictly observed. Entry fee $5 per entrant, and the top 3 fliers shall represent the U. S. A. at the 1968 World Indoor Championship.

Comments by FAI Indoor Chairman

All mention of "zones" in the above is made purely to designate a general geographical area. Nominally, the contestant may choose to enter those trials which result in the least personal travel. Although any contestant may choose either method of local qualification, the AMA contest method was designed for the convenience of those who reside a great distance from local trials or for any who reside in an area where FAI interest is low. Any indoor model with 65 cm span or less may be used to qualify for the next event, provided it is rubber powered. Those who plan to hold trials in their area should consider getting an FAI Sanction. The same sanction is good for one year from date of issue or until a record has been set. It is applicable for use in any ceiling height and will give a maximum of chance for contestants in the program to establish the new FAI records. Also, the 1967 AMA Indoor rules will reflect the new model size, which wipes the record slate clean for FAI Indoor records in all three AMA ceiling categories.

INDOOR RULES

Last month it was announced that two proposals had been submitted to the FFCB for special action. Both have passed by a margin of 9-1, so both will be a part of the 1967 Rule Book.

FF66-B-1 dealt with Easy B:

EASY B MODELS. The Easy B model class has been established to encourage a transition from outdoor models to indoor type models, and as an ideal beginner indoor model. The Easy B model class shall not be eligible to set National Records (except where the model meets the specifications of another indoor model classification).

CHARACTERISTICS OF EASY B MODELS. Easy B models shall meet the following specifications:

Wing Span - The projected span shall not be larger than 18".

Wing Chord - The wing chord shall not be larger than 3".

Propeller - The propeller blades shall be constructed entirely from wood with the following exception: Special Novice or beginner events can be set up for local contests by permitting the use of plastic commercial propellers, provided advance notice is given in contest announcements.

Covering material - There shall be no restrictions on covering material, but local Contest Directors may specify the covering material to be used for a given event provided advance notice is given in contest announcements. Further restrictions on Easy B design and/or construction may be made by the Contest Director for specific events provided advance notice is given in contest announcements.

EASY B COMPETITION RULES. It is suggested that AMA competition for indoor models be used; however, special flying rules may be substituted by the Contest Director for a specific event provided advance notice is given in contest announcements.

FF66-C-1 dealt with Record Trial attendance:

Add to Sec. 2.2: Specific exception for indoor competition and Record Trials shall be made as follows: For Cat. I events a minimum of 5 contestants must present models for processing; for Cat. II events a minimum of 8 contestants must present models for processing.

NEWS FROM AROUND THE WORLD

CALIFORNIA - SAN DIEGO

The San Diego Orbiteers are planning their indoor activity now, and will enter into postal meets also. For info on sessions, contact Clarence Mather, 3880 Ecochee Ave., San Diego, Cal. 92117.

COLORADO - DENVER

The Martin Model Masters are kicking off their indoor season with a look at the NIMAS film of Lakehurst activity. Their contests will all have Easy B this year, and several will have an indoor scale event. All scale mods will have plastic props, maximum of 24" span and must ROG. For more info contact Annie Gieskieng, 730 Moore #2, Denver, Colo. 80215.

CZECHOSLOVAKIA

The Czech indoor fliers went into the Sporthalle in Prague recently to make an attempt upon new records. Th 14.5 m ceiling was high enough for Jiri Kalina to turn i 27:40. To save wear and tear on your slide rule, that is about 48'! By the time you read this, they will have also flown in a 42 m site in Brno, for an attempt on Cat. IV records. Their winter activity will include invitational meets which may be attended by fliers from Germany, Austria and Yugoslavia.

OHIO - CLEVELAND/LAKEWOOD

Indoor Scale competition and Cat. I Record Trials are on tap Nov. 27, 1966 at the St. Edward High School gym in Lakewood, Ohio. Scale models will get a maximum of 50 points for scale fidelity and construction, plus 1 point per second of flight time. For more info, contact Chuck Tracy, c/o Cleveland Press, 901 Lakeside Ave., Cleveland, Ohio 44114.

VIRGINIA - HAMPTON/NEWPORT NEWS

The Brainbusters have already had one indoor session at the Willis School Auditorium, with a good turn-out of HLG fliers. Only three of them had flown IHLG before, and Dave Robelen topped the pro types with a two-flight total of 0:43.4. Not bad for a 20.5' site! Hal Crane's "C" did 11:26 also - these fellows will be mean in any postal meet! For info contact Hal Crane, 4002 Buchanan Dr., Hampton, Va. 23369.

QUESTIONS AND ANSWERS

37. Is there any way to prevent thin indoor ribs from curling or warping when you cut them?

It is difficult to make comments about how balsawood will behave, since it is the most variable of all woods. Both ribs and spars (any member which is quite long with respect to the cross-section) may warp, twist or distort when the wood is cut. Prime causes for this are: wrong cutting technique or internal stresses in the wood. Not much can be done about the internal stresses. Some wood stresses date back to the time the tree was cut or processed, and some result from improper storage or changes in moisture content. If your favorite sheet suddenly gives trouble, wait a while. Sometimes, if you remove a lot of wood from one side of the sheet it will warp; a delay will let it even out.

Cutting errors are numerous. Fig. 1 below shows the most common warps: reduced curvature of the rib or a reverse curve. The major cutting error is to try to make too deep a cut. The knife should be very sharp and the cutting area should be pointed (a #11 X-Acto blade is ideal as long as you use a very sharp one). Even with a very sharp blade the cut should be very light so that 2 or 3 slices are required to separate the rib. A dull blade or a deep cut with a good blade will cause the type of trouble shown in solid lines in Fig. 1 (reduced camber or increased camber). The wrong blade or improper use will cause reversed curve (Fig. 1, dotted lines). Either a very wide blade or holding the blade tilted (not tangent to the template) causes the edge of the blade to rub the wood (see Fig. 2) and force it into a new curve.

In short, a sharp blade with a narrow point, held exactly tangent to the template, and cuts made with light pressure will yield the best results. If the wood still warps during the cut, try another piece of wood.

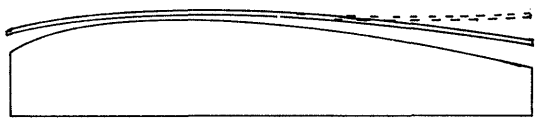


FIG. 1

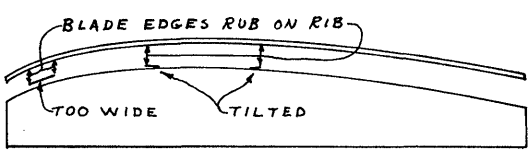


FIG. 2

HINTS AND KINKS

Hints From The World Champs

Bud Romak's fin design (Fig. 1) is easier to mount securely than the standard fin. Normal procedure is to form the outline, splice it, and insert the "rib". Bud's design calls for the rib to extend through the outline at the splice joint. The excess length of rib then serves as a "handle" to glue it to the structure with. If you have a rolled boom, slide the rib into the end. With a built-up boom, it is easy to rig a good joint also.

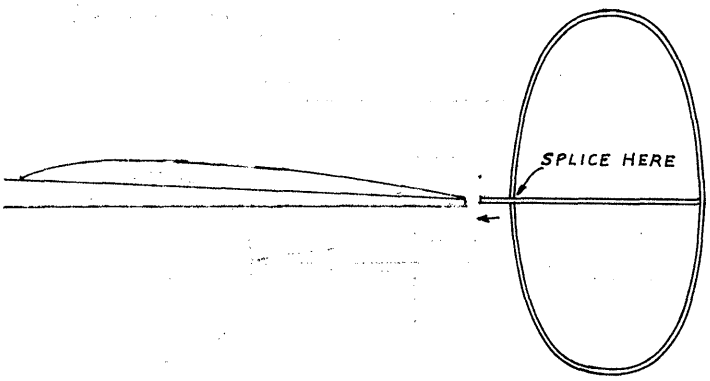


FIG. 1

Hans Beck used a variety of plastic "foam" to mount his props and models with. The very springy nature of this material holds the model parts firmly without danger of crushing. Fig. 2 shows a typical prop mount - a strip of the sponge about 2" wide is slit half-way thru at each prop station. The prop is inserted by spreading the slit enough to give room. When you release the edges of the slit the prop is shock-mounted nicely.

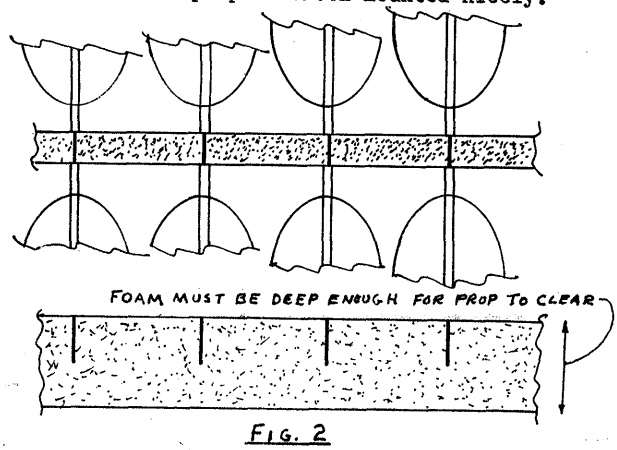
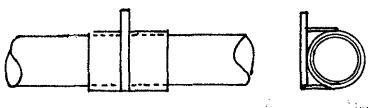


FIG. 2

Manfred Koller solved the problem of torn film at the tail bracing post. When the stab is mounted on the boom, a hole must be made in the film to pass the tail bracing post through. Without reinforcement the hole will usually get inconveniently large. Manfred used a very thin piece of balsa stuck to the stab film as a reinforcement for the hole.

Variable C.G. Location

When you are working out a new design, it would be helpful to be able to move the wing to try new CG locations. Curtis Janke uses two balsa tube which are a snug fit for the motor stick; to each is glued a tissue socket for wing mounting. These can be moved to a new location, spot-glued in place, and flight tests made. When you find the right place, install permanent sockets.



BRACING TECHNIQUES

Part IV - Fuselage Bracing

When the indoor wing changed from a cantilever or unsupported structure to the wire-braced present-day design we shed a lot of weight and increased the reliability of our models. It was not long until this same principle was used on other parts of the model as well. The most popular fuselage brace a few years ago was the two-wire type shown in Fig. 1.

The two-wire brace adds both bending and torsional strength to the fuselage. The fuselage must be held in a jig during bracing for best results. Note that the posts are inserted through the fuselage and glued to the inside of the stick. Another trick is to sharpen the post and stick it through the second wall of the stick with the glue joint outside. This allows better joints with less glue. The chief disadvantage of the two-wire brace is the lack of adjustment. Under certain power conditions the very stiff stick which results from using the two-wire brace permits a power stall. If the stick could bend slightly, a stall would be averted.

The most popular fuselage brace today is the monowire brace, with two main variations. Fig. 2 (side view) and Fig. 3 (front view) show the most popular monowire brace. The monowire is usually permanent, being firmly anchored at both ends and glued to the post. If adjustment is needed (more or less fuselage bowing to control power burst and power stall), the tension is adjusted by moving the wire up or down the post and reglueing.

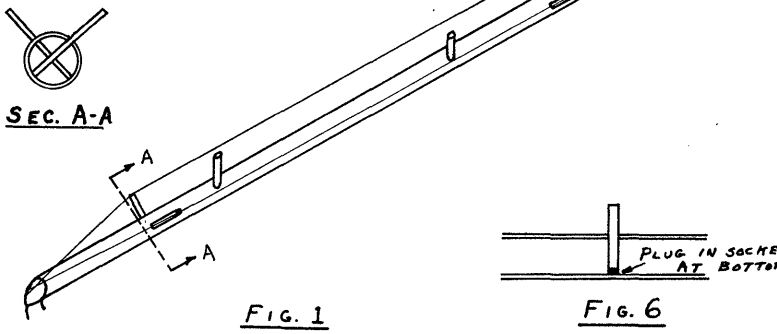
Fig. 4 (side view) and Fig. 5 (front view) shows another adjustable monowire. Since this wire passes thru the wing bracing, it must be removable at one end. The usual method is to hook the free end over the thrust bearing during assembly of the model for flying. The wire is passed over blocks glued to the posts (Detail 1) to give the proper tension. Adjustment may be built-in by using a notched block here; otherwise the block is trimmed off or built up to vary wire tension. The adjustable monowire pushes the wing posts into the sockets firmly, which means that the posts must be cut to the proper length to insure the proper incidence. Also, the socket should use a plug in the bottom to prevent poking the post thru the bottom of the stick (Fig. 6).

The monowire has the advantage of being easier to install, can be made adjustable, and is easy to repair on the field. The usual form of permanent monowire (Figs. 2 & 3), when installed at an angle to clear the wing bracing, also permits a slightly bowing fuselage to give some left thrust to help control the climb during the power burst.

Part V - Tail Bracing

If the fuselage is braced, can we afford to neglect the tail boom and tail surfaces? Not only is the tail boom usually made very light and flexible, it usually has a tendency to droop or curl downward with age. A simple monowire on the boom (Fig. 7) will stiffen the boom and prevent it from curling down. If this wire is made adjustable, it is also possible to change the tail angle slightly.

When the stabilizer is braced, the usual form is like that in Fig. 8. A post is installed thru the boom beside the center stab rib and bracing is rigged to the stab. If the tail is braced, the boom monowire can share the same post. Rudder bracing on trailing rudders usually is like that shown in Fig. 8. In the case of underslung rudders (Fig. 9) the rudder is usually braced with the stab. Fig. 10 shows the stab bracing possible with the built-up boom. The boom is deep enough to give a fairly adequate rigging angle on the wire, and if the stab has been covered with snug film this bracing is quite good. The bracing absorbs up-loads on the stab and the film absorbs down-loads. With the bracing crossing beneath the boom and glued to it, stab twist is prevented. For very small models, Bill Bigge uses a stressed boom with a dacron monowire (Fig. 11) which gives good results. To quote Bill, "The tail boom brace is a relaxable Dacron brace which runs over a hook on the rear strut and is unhooked for storage. The stab l.e. moves up and down on a peg for trim. The brace should run to the stab t.e. because this is more effective in preserving the angular position of the stab, which is more important than preventing simple vertical displacement. The fact that the boom is stiff only against a limited positive load (the preload) is an advantage in ground handling - you can three-point the ship without worrying about overloading the rudder or boom."



SEC. A-A

FIG. 1

FIG. 6

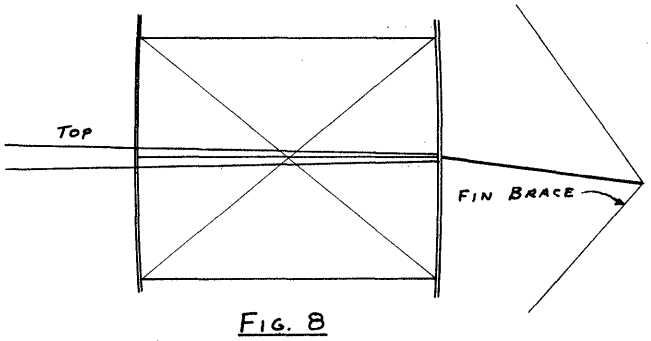
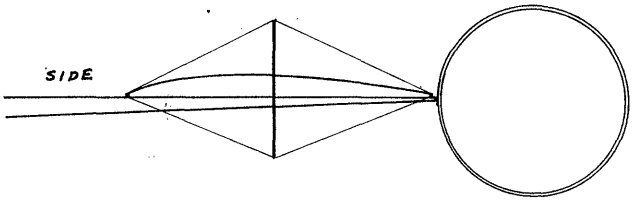


FIG. 8



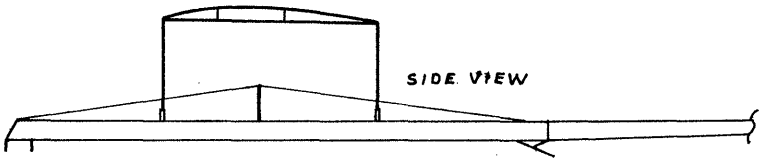


FIG. 2

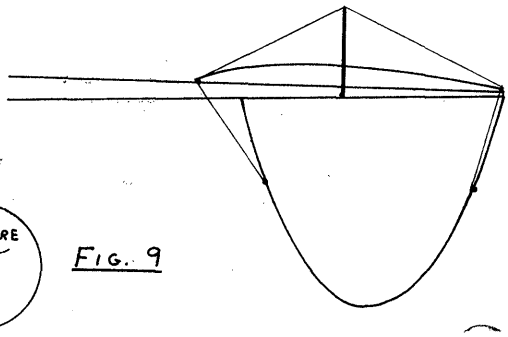


FIG. 9

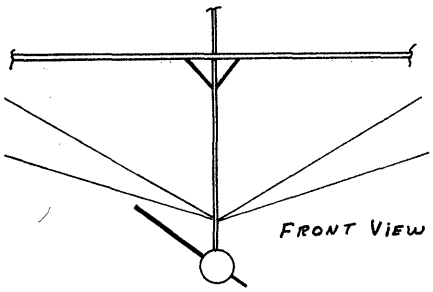


FIG. 3

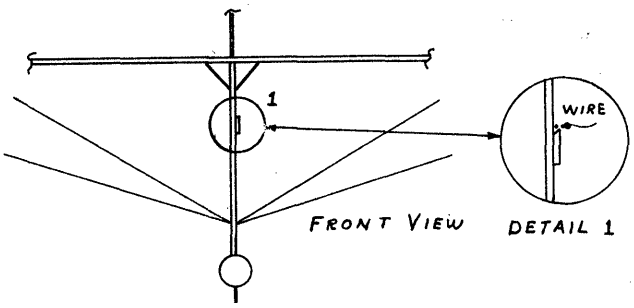


FIG. 5

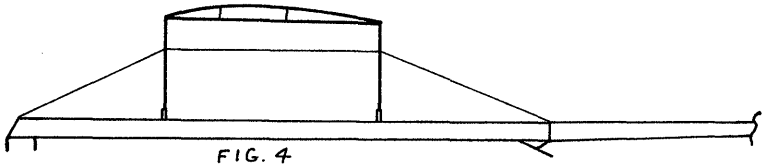


FIG. 4

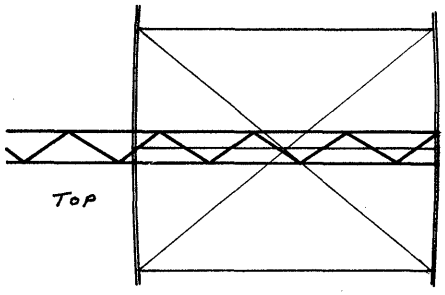


FIG. 10

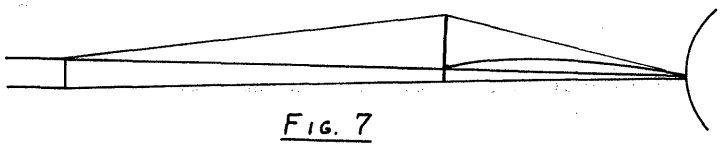
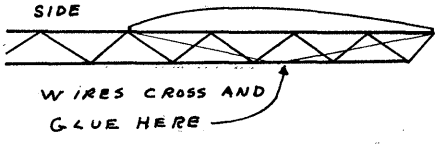


FIG. 7



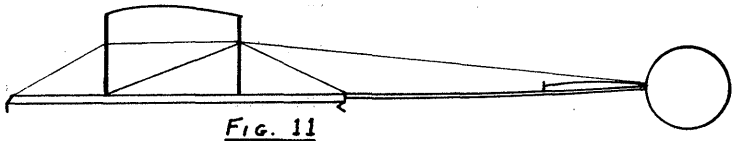


FIG. 11

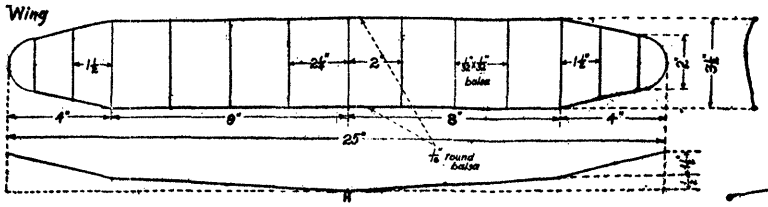
From Among the Rafters

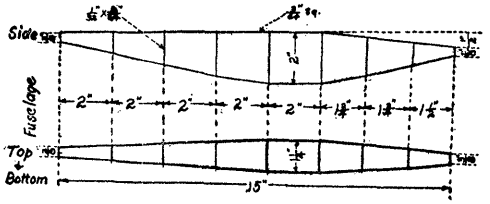
We note with real interest the continued growth of John Pond's Old Timer events...first gas models of the 1930's and early 1940's and now the rubber events. We're all for it. More and more flyers are relaxing and again building, or trying out for the first time, the old style of more pleasurable models. Eventually, it is supposed, there will be a desire to build, not only the old Kovel's and Korda's, but also new designs...with all the latest ideas...to the old rules or to new rules producing similar models and flight patterns. The prospects for recreating completely the Golden Age are dim, however, as there are a lot of other conditions that have changed that are not reversable.

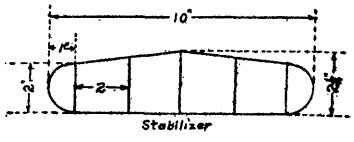
An analysis should be made as to why there is this urge on the part of so many to shy away from the perfectionism of today's model and contest....but not here or now. We merely want to ask if there is a similar urge indoors. Certainly, Indoor FAI is straining towards the maximum...and that is its lure...in the same manner as FAI Gas, Wakefield and Nordic. And there is the similar professionalism presenting a formidable barrier to the newcomer. But, perhaps, that is why we already have Paper Stick, Easy B and more scale activity.

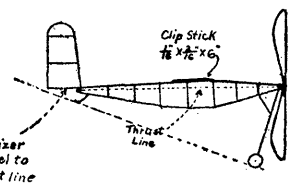
What were the old events, anyway? Indoors, it seems, we must go back a bit further than outdoors...to about 1929-30-31. Undoubtedly, the "Indoor Tractor" was the granddaddy of them all. By 1935 it had developed into the steady microfilm B and C Stick, and has become today's magnificent FAI Stick...the ultimate in indoor flying ...as indeed it should be. The zippy little Baby ROG had already slowed down by 1930 and it continued popular at local meets, if not at the Nats, until WW2. (Thanks go to Fred Weitzel for sending in the clipping of Kittel's Baby ROG; also thanks to M.A.N. for permission to print it.) But now the Baby ROG is in limbo. The model that tried to look and fly most like a man carrying airplane was called the 'Commercial'. It was fairly small, had a cabin of varying size and ROG'd. With ever lighter construction and imaginative interpretation of the rules, the Commercial has changed considerably, becoming the larger Indoor Cabin Class and more akin to the stick model. Popularity has declined.

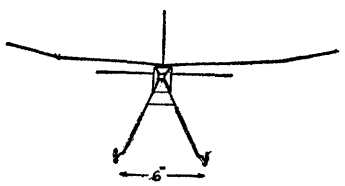
Let's take a look at some old 'Commercials', using as author-ity Carl H. Claudy's "Prize Winners' Book of Model Airplanes", published in early 1931. Edward Harm's (Evanston, Ill.) "Small Indoor Commercial" had a square fuselage with, at most, a cross-section of 1x1. The body looked very much like today's 'Cabin' with a built-up stick enclosing the rubber but with no bulge. Wingspan was about 24" and the prop 12" diam. It flew "about 4 minutes".....
H. Page Hoggard, Jr.'s (Norfolk) "Indoor Commercial" was "designed according to AMLA indoor commercial rule regarding cross-section area which should equal or exceed overall length squared divided by 100". It swung a 10" prop, but further details are unavailable as the plans are missing from this 5th Page writer's copy. On 5/12/30 Hoggard won his event at a Langley contest with 2:52.









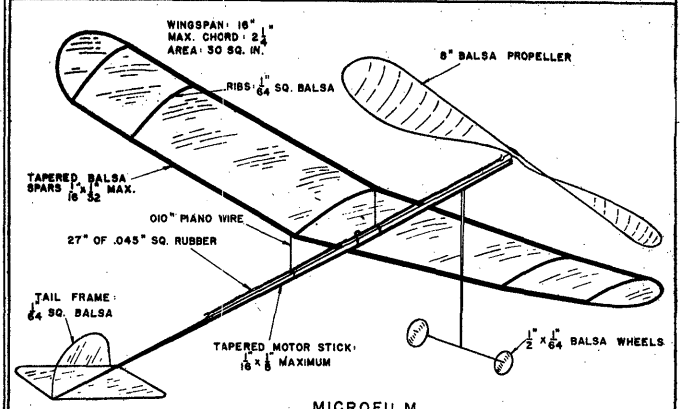


Indoor Commercial by Dale Lively - from "Prize Winners' Book of Model Airplanes", 1931

POSSIBLE RECORD ?

At Lakehurst on 7/3/66 Joe Poloso established what looks like a new record. He made a beautiful flight of 55 seconds with his scale Derperdussin Seaplane, a Henry Struck design from a 1937 FLYING ACES. Although a seaplane, the model took off from the floor, and application should be sent in for .. ....possibly the Category III East Coast R.O.G. Seaplane Scale Duration Record.

MODELS THAT MADE HISTORY — BY J.L. MACKENZIE



MICROFILM

MICROFILM WAS INTRODUCED TO MODELDOM BY JEROME KITTEL OF ENGLEWOOD, N.J. IN THE JUNE 1932 ISSUE OF MODEL AIRPLANE NEWS AS A COVERING FOR THIS MODEL. IT HAD FIRST BEEN USED ON MODELS IN 1930 BY ROBERT CLARY A STUDENT AT M.I.T. HERBERT OWEN OF NEW BRITAIN, CONN. USED A SIMILAR MODEL TO SCORE THE FIRST IMPORTANT WIN WITH MICROFILM BY TAKING THE BABY R.O.G. EVENT AT THE EASTERN STATES INDOOR MEET, NEW YORK CITY, DEC. 29, 1932 WITH A DURATION OF 7 MIN. 29 SEC. BY THE TIME OF THE NATIONALS IN JUNE 1933 ALL INDOOR WINNERS WERE USING IT.

MODEL AIRPLANE NEWS • August, 1966

Junior Simplified Cabin Models

The October 1965 INAV presented two good approaches by Lloyd Wood to simplified cabin structures. Two such designs that were successfully flown at the 1966 Nationals will be detailed here in a subsequent issue.

David Howell's (Detroit) "Commercial R.O.G." had a 2" equilaterally Triangular cross-sectioned fuselage using a motor stick. In those days rules allowed openings in front and rear for access to rubber or for inserting motor sticks. Wingspan was 20", propeller 8" diam. This model won a Detroit meet with 2:31 and, on a better day, had done 3:35, with Howell predicting it could do 5 minutes with a larger prop.....
....Dale Lively's (Clarksburg, W. Va.) "Four Minute Commercial" "comes under rules of NAA as a Class C plane, with a wing area of 99 sq. in., a 2 wheeled LG of 1¼" diam., and a fuselage cross-section equal or better than length squared divided by 100". Span was 25", prop 12" diam. and fuselage 'box' 1¼ x 2 x 2.

Rib Template

Rudder made like half of Stabilizer

Albert B. Schwarzkopf, Jr.'s (Norfolk) "Indoor Commercial" (plan also missing) had a 10" prop and flew 2½-3½ minutes.....James Shield (Detroit) described his as an "Indoor Commercial Model Conforming to the Wakefield Regulations". It had a 20" span with a fuselage 'box' measuring 1-5/16 x 2 x 2½. A motor stick was used and wing was clipped to 'a dummy motor stick' atop the fuselage. With a 10" prop, the model was "capable of making at least 4½-5 minutes".

Full Size Nose Plug

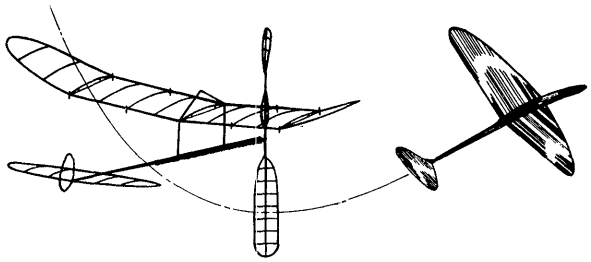
1/8" Washer

Full Size Wing Clips Make Two

Hmmm.....these Oldies do sound rather interesting, at that...!!!!

The Voice of N.I.M.A.S. DEC·1966

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

NAT ANTONIOLI, 3559 Chasewood Dr., San Diego, Cal. 92111
DAVE ROBELEN, 17 Catalina Dr., Hampton, Va. 23364
FRED STEWART, Colony Apts, C-3, Ephesus Church Road, Chapel Hill, N. Car. 27514

NIMAS Awards

Gold Cat. I HLG Award - 0:30.5, Clarence Mather

The Election

The new AMA President is Cliff Wierick. He was elected by getting slightly more than 50% of the total votes cast. Approximately 14% of the eligible voters actually cast their ballot, so once again AMA affairs are decided by a minority. It must be quite disheartening to the candidates to find out how few AMA members actually care anything about AMA business.

C.D. License Fee

Action taken by the 1966 Executive Council increased the initial cost of the license for Contest Directors to $10; upon receipt of the contest report from a Class AA or larger contest the "extra" $4 will be refunded. No provision is made for CD's who hold Class A meets, Record Trials or FAI Team Qualification Trials. If you feel, as I do, that this unfairly discriminates against indoor CD's and CD's for small clubs, write to your District VP and ask him to support the move presently being made to make the rebate applicable to CD's of all contests and Record Trials. It will take more than 14% of you to make a difference - express your views! The name and address of your District VP will be found on p. 44 of the Jan. '67 AMERICAN MODELER.

NFFS

The National Free Flight Society is finishing out a very successful year of operation, and is looking forward to many more of the same. Now is the time to renew your membership - send $3.50 to Hardy Brodersen, 4729 Walnut Lake Rd., Birmingham, Mich.

Indoor Films

The original NIMAS films taken by Joe Poloso at Lakehurst are still available, plus (Joe has been at it again) a short color sequence of microfilm models and black and white action shots of indoor scale activity. Any of the above films are available to clubs wishing to show them; the only cost is to pay film transportation both ways. At the present time, there is only one mailing container for all the films, so only one can be loaned at once. If anyone can donate a mailing container for a 7" reel, a second film can be on loan also. All the above films are 16 mm. silent films, incidentally.

Waiting?

If you recently wrote, renewed your membership, won a NIMAS Award, or whatever: I haven't forgotten you. This time of year is the busiest time for your editor and his rate of operation has been slower than usual due to a sprained ankle which kept him on crutches for over three weeks. This doesn't mean that you shouldn't write, for communication in the lifeblood of NIMAS. It just means that only things which require immediate answer will get it, instead of all the mail, and the rest will be along pretty soon.

FAI INDOOR REPORT

Team Selection Program

If there are any differences in wording between the text published in the Nov. '66 INAV and the Jan. '67 AMERICAN MODELER (p. 38), the version in A.M. is official. Last minute modifications were agreed upon without interchange of text - leading to possible differences in wording.

CD Listing

Since the Team Selection Program officially begins on Jan. 1, 1967, it is not too early to find out where you can qualify. The list of names below includes those who have volunteered to help direct Qualification Trials in their area, contingent upon support by local fliers. In other words, if you want to qualify, notify the CD for your area so planning can begin.

Bill Bigge
5131 Mass. Ave. NW
Washington, D.C. 20016

Bob Champine
25 Beechwood Dr.
Yorktown, Va. 23490

Ron Ganser
2500 Mission St.
Pittsburgh, Pa. 15203

Ray Harlan
15 Happy Hollow Rd.
Wayland, Mass. 01778

Bob Randolph
5785 Forest Ridge Dr.
N. Olmsted, Ohio 44070

C. V. Russo
143 Willow Way
Clark, N. J. 07066

Tom Vallee
9136 Edmonston Ct. #304
Greenbelt, Md. 20770

If you live in another geographical location, contact one of the following zone Chairmen (although Bud Tenny is the only one who will remain active in program direction after Jan. 1, 1967, the others will help with addresses and info as needed. Questions, complaints and protests should be directed to Tenny after the program begins):

Charlie Sotich
3851 West 62nd Place
Chicago, Ill. 60629

Bud Romak
85 Sullivan Dr.
Moraga, Cal. 94556

Bud Tenny
Box 545
Richardson, Texas 75080

POSTAL CHALLENGERS

Bob Clemens, 255 Susan Lane, Rochester, New York 14616 has requested postal competition in HLG, Easy B and Indoor Stick. His site is 23', and standard fudge factors will apply ("fudge graph" for HLG, Oct. '66 INAV).

RECORDS? MAYBE!

RECORD TRIALS, St. Edward High School Nov. 27, 1966
Lakewood, Ohio Cat. I, 35' ceiling
Jr. Paper Stick - 8:28.0, Linda Randolph
Sr. FAI Stick - 15:46, Neil Shipley
Sr. HLG - 1:13.8, Bill Schubert

INDOOR RULES

The two proposals detailed below have been submitted to the Free Flight Contest Board for initial comment; both have been favorably received by the six Districts which have reported back.

FF66-D-1: Change Section 4, Par. 4.7 to read:

4.7 PREPARATION FOR FLIGHT. The flier or proxy flier must start and regulate the engine of free flight and radio control models, wind the motor of all rubber models except indoor models, and operate the launching apparatus of gliders. The flier or proxy flier of an indoor rubber model must either hold the model or wind the motor; auxiliary winding devices which facilitate one-man winding are permitted if operated by the flier. Motors of control line models may be started and regulated by an assistant.

FF66-E-1: Change Section 10 as follows:

10.3 CONSTRUCTION. No restrictions shall be made upon either construction or design of indoor gliders, except that the structure shall be strong enough to meet the requirements of Par. 10.4.

10.4 HAND-LAUNCHED. A glider is hand-launched when it is thrown into flight directly from the hands of the launcher. The glider shall not be launched from an altitude greater than the flier's normal reach from the floor, and the launch shall be made with sufficient force to cause the glider to gain a substantial amount of altitude.

QUESTIONS AND ANSWERS

Question #36 dealt with poor climb, washin and climb trim in general. After discussion with several indoor fliers, I have concluded that my model's problem was lack of washin. It had considerable wing offset, and was in general similar in layout to Sotich's Dram Dip. These comments tend to substantiate this: Ernie Kopecky, commenting on Hans Beck's trim, which included washin on the inboard wing and washout on the outboard, "Some sacrifice of efficiency here, but as you say, a nice classical climb. I sort of drifted away from washin and washout because the model would go too high too fast. It appears that it is more important in a limited space to trim for a tight turn with better chances of finishing the flight."

Dick Kowalski: "Very loaded question! I'm not so sure that anyone completely understands how wing washin works from the theories I've heard advanced. For example, many believe that the washed wing, by increase of angle of attack, provides a rolling moment to balance the anti-torque rolling moment created by the rotating propeller. If so, then why does a model with little or no washin roll in the direction of propeller rotation upon propeller and wing stall? For awhile I thought this had something to do with the yawing moments about the wing center so I built assymetrical wings. I found that they still required washin to fly under climbing conditions. That fan in front with its relatively large disc area, the circling flight and relatively high torque moment during the climb all enter the act and confuse any simple approach to the problem."

Finally, Hacklinger concludes a discussion of asymmetric flight characteristics ("Theoretical and Experimental Investigation of Indoor Flying Models") with this comment: "For the practical purpose we shall proceed as follows: for the radius of turn adopted for the model the variation in speed across the span is determined and the wing is twisted so that elliptic loading is re-established. This twisted wing will then be offset from the fuselage axis by an amount $e = Q_H/W$ (Q_H = propeller torque in level flight and W = flying weight of model) so that the rolling moment in horizontal flight is just cancelled. Thus, for the greater part of the flight, sideslipping, which the propeller would otherwise cause, will be prevented without an increase in drag."

NEWS FROM AROUND THE WORLD

CALIFORNIA - SAN DIEGO

The San Diego Orbiteers are flying indoor regularly in two Cat. I sites. HLG is going the best, with times in their 22' site like this: Nat Antonioli - 0:26.5 + 0:26.1; Clarence Mather - 0:25.8 + 0:24.2. Also, Clarence has designed an Easy B size ROG with certain minimum material sizes; it is an "indoor trainer" which shows good promise.

MICHIGAN - ANN ARBOR

The Ann Arbor Airfoilers are carrying on with flying sessions planned every month for a while. A new site, the Bowen Field House in Ypsilanti, Michigan, is working out well. A Nov. 19 session had good attendance and many good flights. Contact Ned Smith, 536 S. Forest, Apt. 12G, Ann Arbor, Mich. 48104 for dates and times.

OHIO - CLEVELAND

102 trophies and prizes for 23 flying classes divided into six age groups - that is the layout for the 16th Annual Great Lakes Indoor Air Meet. It will be held on Jan. 22, 1967 at the Public Hall in Cleveland, Ohio. It is a contest that has to be seen to be believed, with 5000 official flights made in a single day. Get your entry blank from Chuck Tracy, 901 Lakeside Ave., Cleveland, Ohio 44114.

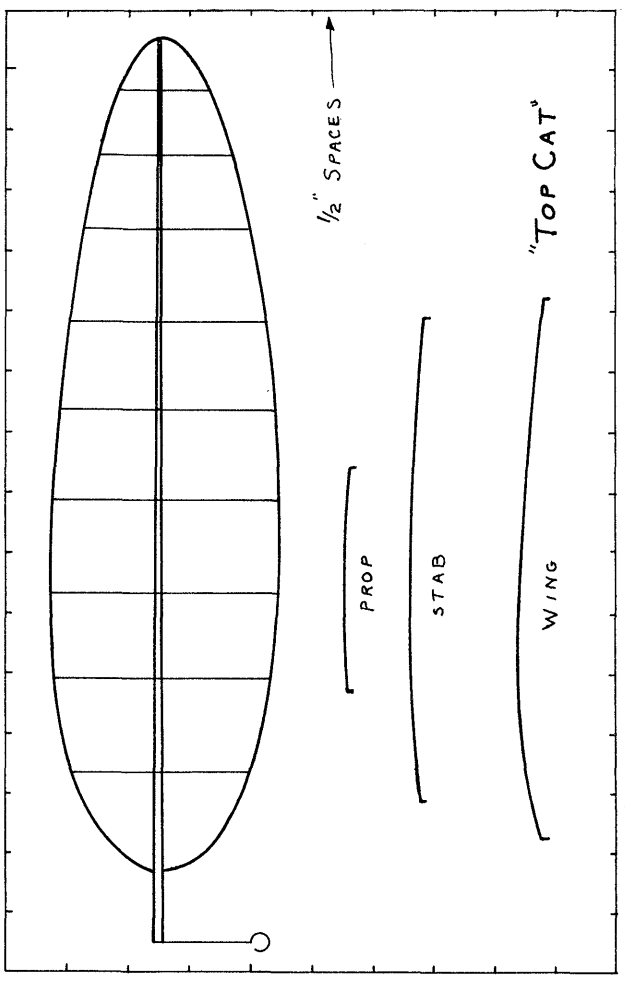
VIRGINIA - HAMPTON

The Brainbusters club has exploded into a flurry of activity - Don Orr has the HLG boys out every Monday and Hal Crane is "running interference" for them by arranging the sessions. The Dec. 5 session at the 24' Armstrong school gym produced HLG flights of 0:26.5 + 0:26.0 for Bob Champine and 0:26.0 + 0:25.0 for newcomer (to indoor) Dave Robelyn. On the previous Monday at the 20+' Willis school Hal shut down the gliders long enough to do 9:36 + 11:12 with a 65 cm. FAI.

STATE OF THE ART

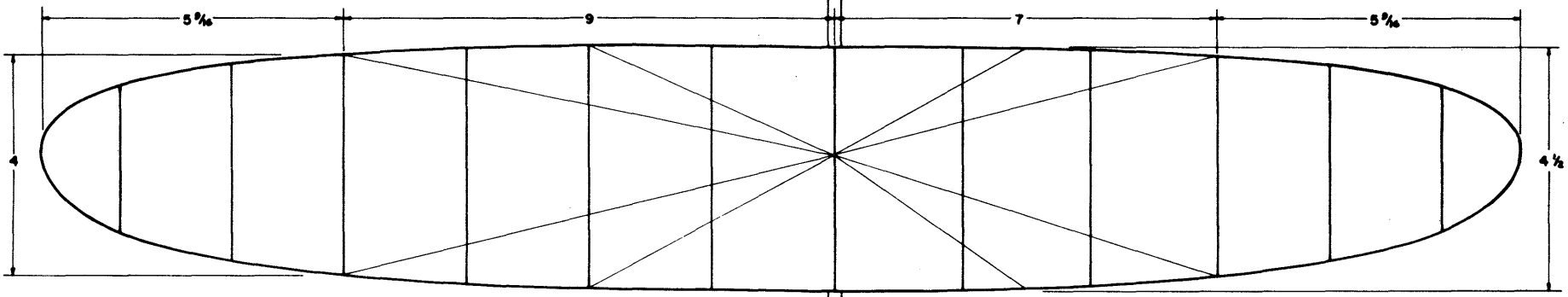
"Top Cat", our model of the month, has been a winning design for Bob Randolph and his daughter Linda. It was developed from a basic design by Bill Bigge, and the 7 paper versions and 2 microfilm versions have racked up an enviable record. It won second place in both Jr. & Open paper stick at the Nats, and now holds five Jr. & Open records, at least one in each ceiling category. The top unofficial times as a paper stick model are: Cat. I - 12:17, Cat. II - 19:00 and Cat. III - 22:51. The record holders ranged from .044 oz. to over .060 oz.; power has ranged from a 13" loop of .041" rubber to 24" of .072". Prop sizes ranged from 14 x 28 to 15½ x 25.

The covering is usually "gater paper" - so named by Neil Shipley. This is prepared by cutting condenser paper to approximately what will be used to cover one surface, and spraying it with water or alcohol food coloring while it is sticking to a vertical glass surface like a mirror. After it is dry, it is carefully peeled off and ironed lightly to preserve the wrinkled surface which develops. The model can be covered fairly smoothly with this and changes in humidity will not warp it. The prop outline and airfoils appear below and can be scaled up to proper size by using the grid marks around the edge.

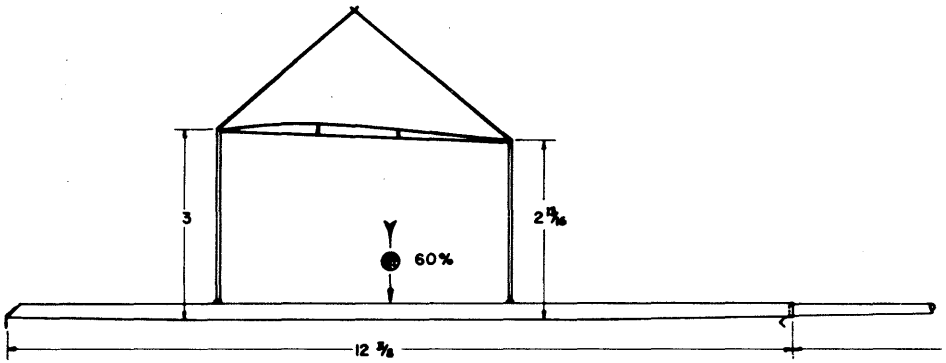


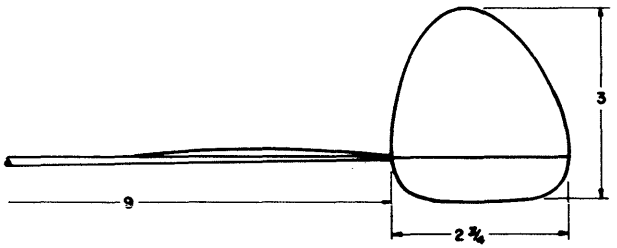
WING RIBS —.020 X .030
WING SPARS—.034 X .045—.042

STAB RIBS—.020 X .030
STAB SPARS—.030 X .035



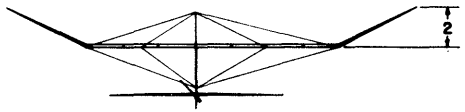
3/32 WASHIN IN LEFT WING





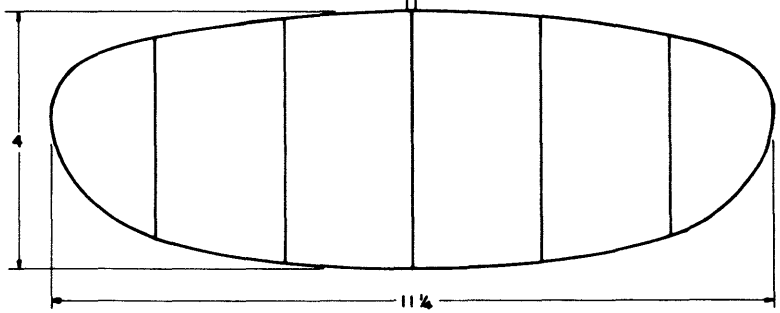
WEIGHTS

WING	.0220
STAB	.0055
STICK	.0100
BOOM	.0030
FIN	.0010
PROP	.0095
TOTAL	.0510 OZ.



NOTE THRUST BEARING OFFSET 45°

PROP 15"DIA. X 25" PITCH



TOP CAT

DESIGNED BY LT. COL. BOB RANDOLPH
DRAWN BY NEIL SHIPLEY

BRACING TECHNIQUES

Miscellaneous Braces

In addition to the bracing discussed previously, many other ideas have been used to improve structural integrity of indoor models. The wing post-spar brace (Fig. 1) is an old one which is useful in helping the wing avoid twisting; it also greatly improves the post-wing joint without much weight penalty.

Cat. I and Cat. II models frequently hit obstacles, and the resulting force on the wing tends to twist it or distort it. Similarly, the wing is stressed in the same manner when you balloon the model. Fig. 2 shows my solution: .028" sq. strips which glue to the bottom of the wing spar and pass between the compression member and the rib of the center compression rib. This gives about .0007 oz. weight penalty; the loading here is all tension, and nichrome wire or dacron sewing thread can be used. A similar solution is shown in Fig. 3, with a single strand of dacron monofilament criss-crossed on the bottom of the wing. For maximum effectiveness the filaments must be glued together where they cross. If you don't cover the surface flat (Bilgri method), or if you use elliptical dihedral (<u>any</u> curve in the spars), this type of bracing <u>must</u> be applied after bracing. Even slight curvature of the spars increases the tension of this type bracing and will pull more camber into the wing.

Motor sticks receive other stresses besides torsional and compression loading. How many of you have squeezed a stick while the motor is wound and had it collapse? Or, softened it with perspiration in the heat of the day? Fig. 4 (Sec. B-B) shows two very small struts which have been installed thru the fuselage at right angles to each other (a pin or small drill will make the proper size hole), glued to the outside of the stick and trimmed off. Anything which helps hold the fuselage in the tubular shape increases the strength of the stick (Did you ever have a stick collapse at the wing sockets?) and the webs which mount the thrust bearing and rear hook can help. Sec. A-A (Fig. 4) shows the thrust bearing web installed in slots in the stick, and glued both inside and out.

Bob Champine's tail bracing (Fig. 5) yields both tail support and adjustable incidence in the stab. The tail boom ends in a tissue socket which fits the bracing post. The tail assembly mounts to the boom only at the leading edge; the socket and post fit snugly and provide good support while permitting incidence adjustment.

Throughout this series, the compression rib has been shown as a matter of course. The "why" of a compression rib may not be clear at first, but if you study a vector force diagram of the bracing system, part of the tension in any wire which attaches to the cabane can be resolved into a compression force on the rib. Therefore, the compression member is added to the rib, with crosspieces to cause each part to share the load. This type of structure bears compression loads more readily, but it does pay to skimp on strength of compression ribs. Fig. 6 shows the top view of a braced wing, with locations for compression ribs marked. Locations marked "1" are mandatory; compression ribs <u>should</u> be used at "2" on conventional bracing and are mandatory on elliptical bracing.

The Hungarian models flown at Debrecen used secondary bracing as shown in Fig. 7a. I wasn't able to communicate well enough to find out <u>their</u> reasons, but one effect of this arrangement is to minimize the compression force on the ribs at location "x". A detrimental effect would be to apply a downward force to the cabane at "y"; this might collapse the cabane under extreme conditions. Fig. 7b shows an arrangement that is untried as far as I know; it should replace conventional secondary bracing and eliminate necessity for a compression rib at the secondary bracing points.

Back to Fig. 6: although it is customary to use a compression rib at "3", it is not mandatory. All the stress there is tension and the compression member can be replaced with wire (Fig. 8). To my knowledge, Frank Cummings originated this application; it yields a modest weight saving but requires extra care in handling.

Bracing Material

A brief mention of what material to use for various braces should be made. The most stringent requirement for a bracing material is adequate strength and lack of stretch. For fuselage bracing, .002" steel wire as sold by Bill Bigge has zero stretch, and tungsten wire (.001") is quite good. Nichrome wire is inadequate for fuselage bracing because it will stretch a little and not return to the original length. Nichrome wire and karma wire as sold by our suppliers are used for wing and tail bracing by most people. Dacron monofilament is adequate for all wing and tail bracing, plus any other special tasks mentioned in this series. For beginner bracing, hot stretched dacron sewing thread (address of supplier on request) is an ideal material.

This concludes the remarks on bracing, but does not close the door on comments anyone else might want to add to what has appeared here. If you have comments or suggestions, send them in.

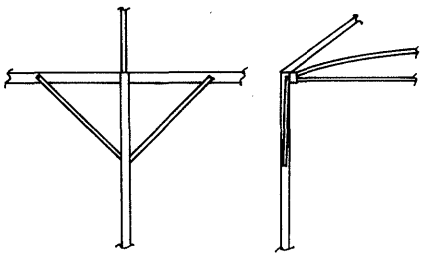


FIG. 1

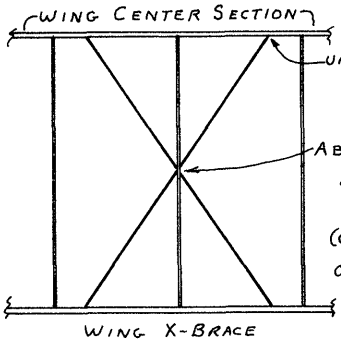


FIG. 2

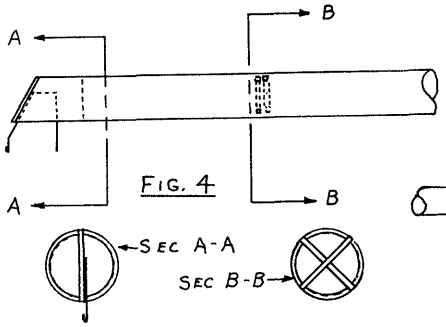


FIG. 4

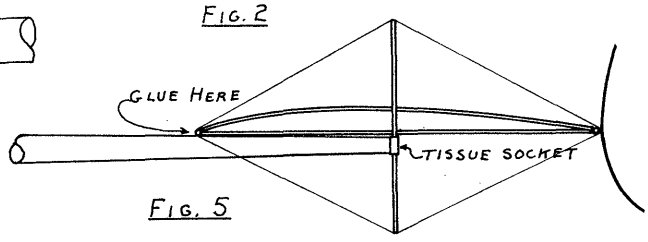


FIG. 5

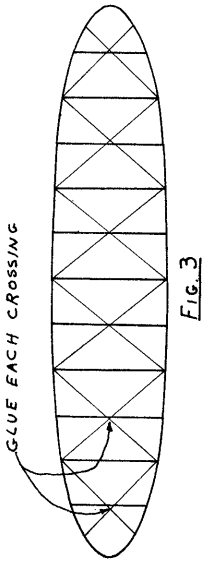


FIG. 3

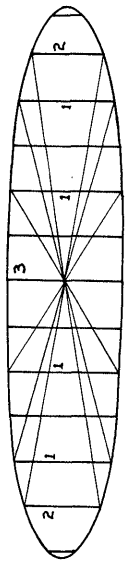


FIG. 6

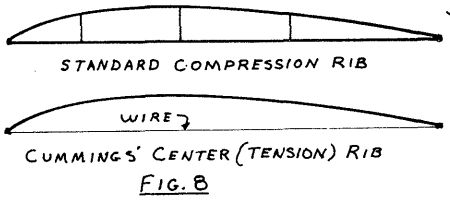
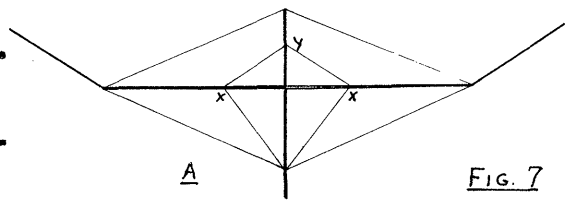
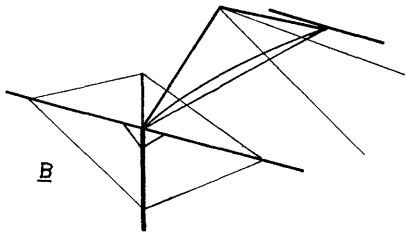


FIG. 8



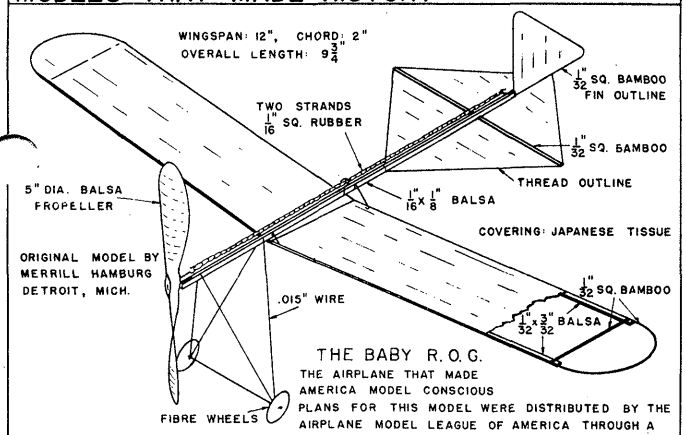
A



B

FIG. 7

MODELS THAT MADE HISTORY BY J. L. MACKENZIE



THE BABY R.O.G.

THE AIRPLANE THAT MADE AMERICA MODEL CONSCIOUS

PLANS FOR THIS MODEL WERE DISTRIBUTED BY THE AIRPLANE MODEL LEAGUE OF AMERICA THROUGH A NATION WIDE MAGAZINE-NEWSPAPER TIE UP IN 1927, STIMULATING A WAVE OF MODEL BUILDING ENTHUSIASM WHICH LED TO THE FIRST "NATIONALS" IN 1928.

MODEL AIRPLANE NEWS
January, 1956

From Among the Rafters

Junior Problem?...What Junior Problem?....Aren't we calling a 'problem' that which really is but 'change'?

* * * *

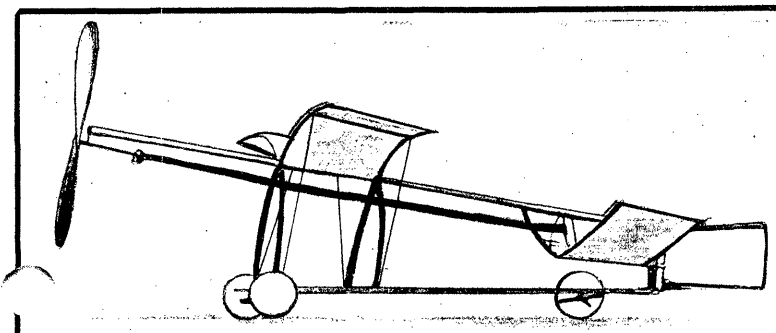
The Baby R.O.G. may be in limbo now....but it sure did wet-nurse the 'Golden Age'. Lots of us started with that Baby, and the M.A.N. clipping here shows one of the real culprits. This one by Merrill Hamburg is the one that did in this Page Five Writer and his brother.....at a class at Angier Grade School the summer of 1928 or 29.....Can still remember hammering away at that nail to make the prop hanger and carefully carrying it up to be drilled. But ours never reached completion. One evening our kittens whiffed drying ambroid....and meow and a thousand bits of balsa and two happy cats!.....But we were hooked, so back to class and start again.

Then came joining Boston's J.A.L. where membership provided a kit of a Baby R.O.G. designed by the George D. Wanner Company, Pro-tion & Supply Division of the Airplane Model League of America. wings here are from "Beginners Book of Model Airplanes" by Carl H. Claudy, published in 1930. Empennage was of .014 wire, and wings of 1/8 x 1/32 cemented flat to the tissue. With warps assured, ours insisted on chasing its tail in a vicious 4' circle....but fly it did and our Silver Wings were won!

Fun?..You know it was!..We kids weren't just flying Baby R.O.G.s....we were Lindy in the Spirit of St. Louis and Dick Byrd in his Fokker Tri-Motor and Raoul Luffberry diving out of the sun ....with our sights on becoming Aircraft Engineers, Aviators, Airline Managers.....and some of us even made it.

* * * * *

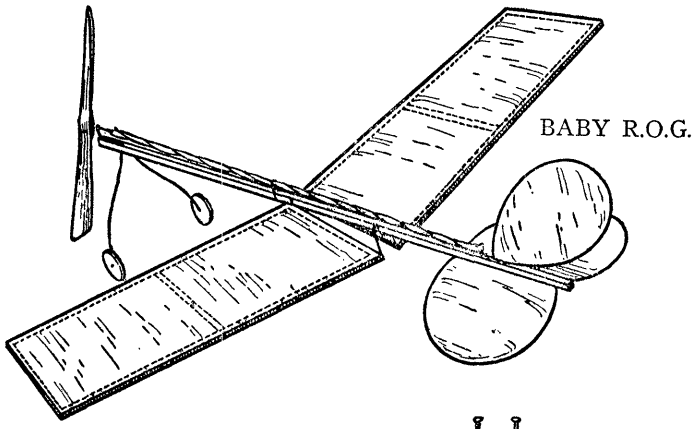
Two questions.....First...With that kind of inspiration, how could the 1930's have become anything but 'Golden'?.....with the Juniors leading the way. Second....Where is there today any comparable inspiration?.....But there are youngsters today who would like to build and fly model airplanes, and we laud those individuals who give their time...and laud the AMA and the magazines for now giving some attention to them.



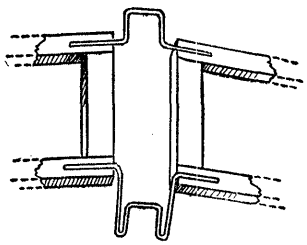
And here is an R.O.G. from the days before Lindbergh touched it off...An illustration from the original 1910 edition of Francis A. Collin's book, "The Boys' Book of Model Aeroplanes".

Long Island - New York

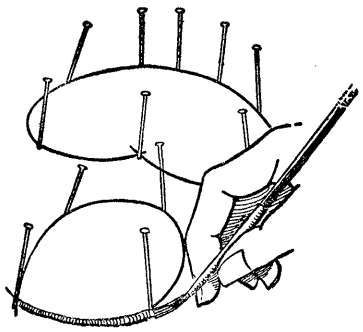
The Grumman Engineering Model Society's winter contest activity is in full flight under Jean Paillet and Max Chernoff at the Thompson Junior High in Syosset. Indoor Scale was flown Nov. 9 and B Mike and Glider Dec. 1 (at King s Point). Scheduled for Dec. 14 is Paper Cabin and Jan. 25 a Postal Contest with Levittown, Pa., in Mike and Glider. Further dates are being scheduled later on. For details contact Mr. Paillet at 515-MA 6-2825 (home) and 516-LR 5-2388.



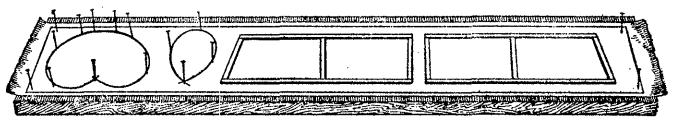
BABY R.O.G.



Wing clips joining Baby R.O.G. wings.



Applying ambroid to wire on tissue.



Lay-out for construction of wings, vertical fin and stabilizing plane of Baby R.O.G.

Union, New Jersey

A fun flying session on November 17 brought out Microfilm, Old-timer Tissue, Easy 'B', Flying Scale and Glider. Several Lakehurst FAI fliers were on hand and Joe Wagner (1967 FAI Gas Team Member) flew his Sommer's Scale against Ed Franklin's.

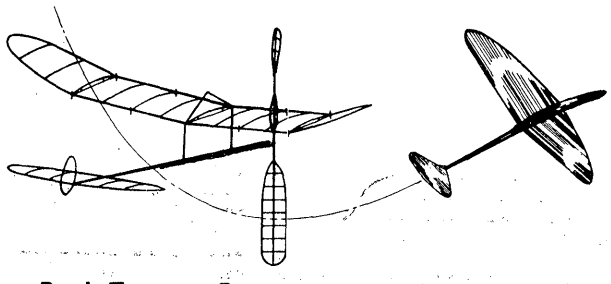
Future dates are set for Jan. 12, 1967, Feb. 16 and March 9. As in Syosset, flying starts at 7 PM. You had better get instructions on locating the site, so contact C.V. Russo at 143 Willow Way, Clark, N. J. or Ed Franklin at 226 Harrington St., Bergenfield, N. J.

Biplanes for FAI...???

The smaller 65cm span could bring more interest to FAI....and it might very well also bring attempts to crowd on more wing area. Ed Whitten suggests biplanes for both FAI and Easy B. Will the extra area of a biplane add more to duration than the extra weight will subtract? And how about taking a current 90cm FAI model and try substituting a 65 cm biplane rig? Why not try tandems?....and we can always just lower the aspect ratio.

The Voice of N.I.M.A.S. JAN·1967

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

LAWRENCE L. CAILLIAU, 5260 Skyline Dr., Shawnee Mission, Kansas
JOHN T. GANSER, 217 Duncan Ave., EllWood City, Pa. 16117
IRVING JOHNSON, 222 N. Lombard Ave., Oak Park, Ill. 60302

NIMAS Awards

Silver Cat. I HLG Award - 0:26.0, Dave Robelen

Silver Cat. I HLG Award - 0:27.5, Bob Champine

Gold Cat. I Rubber Award - 13:56, Hal Crane

Silver Cat. III Rubber Award - 30:35, Bob Champine

NFFS

If you haven't renewed your membership in the National Free Flight Society, now is the time! One major change in the line-up of officials is that Dave Linstrum is now the editor of FreeFlight - good luck, Dave! Many big things are on tap for NFFS members this year, so don't miss out. Send checks payable to NFFS to Hardy Brodersen, 729 Walnut Lake Rd., Birmingham, Mich.

1st International Paper Airplane Competition

SCIENTIFIC AMERICAN Magazine is sponsoring a competition for paper airplanes (like the ones we still fly if we think no one is looking). Well designed trophies will be awarded to winners in each of four categories: (a) duration, (b) distance flown, (c) aerobatics, and (d) Origami. Winners who are not involved professionally in air travel will receive a silver trophy, and those who are in air travel, full scale aviation and subscribers to Scientific American will receive a titanium trophy. The deadline for entry has been extended to Feb. 14, 1967, so send for your entry blank. Scientific American, 415 Madison Ave., New York, N. Y. 10017. The entry blank will contain the rules plus considerable interesting and entertaining reading.

Change of Address

Effective Jan. 21, 1967, Tom Vallee's address will be: 444 Henryton So., Laurel, Md. 20810.

Back Issues?

For those who want back issues, there are about 30 issues in the back issue file. All of 1966, all of 1965, most of 1964 and a few of 1963 are still available, but some of these are getting rare. NIMAS members may obtain a set for the cost of postage and handling (65¢, preferably in stamps): for subscribers the cost is 10¢/copy.

Special Announcement

Year-end action by the 1966 AMA Executive Council has made the $4 rebate applicable to CD's who direct any level of AMA contest, plus helping with the Nats and other large contests as event and category directors. That is, CD's now pay $10 for their license with the rebate coming when they direct their contest or event.

Special action between AMA (after reviewing the claim situation) has resulted in eliminating the extra insurance cost of holding indoor contests. That is, since the new insurance program went into effect in 1966, all contests not sponsored by Charter Clubs had to pay $5 extra for their sanction to cover the insurance; this extra cost has been eliminated.

FAI INDOOR REPORT

Team Selection Program

The Team Selection program is now officially under way. Those who wish to qualify by either method (see Nov. '66 INAV or Jan. '67 AMERICAN MODELER) would be well advised to make their official entry by sending $2 to AMA HQ. You will receive in return a special entry form to indicate you have officially entered. You will then be able to qualify at any regular Local Qualification Trial or at any sanctioned AMA indoor contest as long as your model is 65 cm. span or less.

CD Listing

Add the following names to the list which appeared in Dec. '66 INAV; they will also hold Qualification Trials or will have information pertinent to their area:

Bob Hanford
3838 South 88th E. Ave.
Tulsa, Okla. 74145

Dick Ganslen
917 Blackberry
St. Charles, Mo.

Team Selection Trials Schedule

TEXAS - Dallas: Feb. 26, 1967 Bud Tenny, Box 545, Richardson, Texas 75080 (Local Qual. Trial)

VIRGINIA - Hampton: Jan. 22, 1967 and Mar. 18, 1967 Bob Champine, 25 Beechwood Dr., Yorktown, Va. 23490 (Both Local Qual. Trials)

POSTAL CONTESTS!

Lest we forget, it will soon be time for the NIMAS Easy B Postal Meet. As it was last year, flights may be made in Feb. or March. Full rules will appear in Feb. '67 INAV; plan to enter! Everyone who entered last year had a ball, and NIMAS Certificates were awarded to three places in Jr. and Sr.-Open. All times corrected to one ceiling height via standard fudge factor.

Steering Change?

Possible changes to the FAI rule covering balloon steering were discussed at the Nov. CIAM meeting, but no changes were made. Sandy Pimenoff, FF Subcommittee Chairman, suggested the following:

To prevent a model colliding with the structure of the building or with another model a balloon or a stick not longer than 8 m. may be used not more than twice during any one flight. The balloon cable or stick may remain in contact with the model for not more than 10 seconds each time it is used.

A counter proposal, generated by Bud Tenny and Bob Champine, reads thus:

To prevent a model from colliding with the structure of the building or with another model, a balloon or a stick not longer than 8 m. may be used for two ten second periods during any one flight. The ten second steering period shall commence when the steering device first contacts the model, and the contestant may continue steering for the full ten second period, regardless of the number of intermittent contacts between the steering mechanism and the model. The steering tactic is intended to change the model's direction of flight only. It must be performed by the contestant from the level of the main floor or launching area. In cases of physical disability of the contestant prior arrangement for a substitute must be made with contest officials.

Flight Tests

Members of the Hungarian Aero Club took full advantage of a unique opportunity during the World Championship in Debrecen last summer. Small teams of men stood around with stopwatches and took notes, recording the flight data from some of the models flown. I am indebted to Ree Andras of Budapest for the information presented in Fig. 1 below, for he recorded the data and sent it to me. Due to lack of time and experience, I will forgo any conclusions to be drawn from this data, except to point out that the flight by Frank Cummings appeared to be set for almost 30 minutes from an altitude of only 18.5 m., or 61 feet. Also, it is interesting to speculate on how much time Beck's model might have done if it had just missed the top and thus avoided a loss of 5 m. altitude.

Back on my soapbox: This type of flight data is the only way to prove how much better one model design is than another. It is the only way to prove if a change in flight trim improved or impaired the performance of your model. Note that no amount of flight testing will insure that you will win the World Championship; there are too many factors and too many conditions beyond your control. I agree with Ree that Frank's model showed the most potential of any model at Debrecen; the "hooker" is that Frank's model was unable to combat the high drift as well as Beck's model and Beck was very lucky to miss hanging on the ledge on his three "all-out" flights. What flight testing will do is two-fold. First, you will find the best prop-rubber-trim combination for your design in a given ceiling and be able to make educated guesses about what will be needed in a different ceiling. Second, your flight records from the test program will enable you to check model performance during official flights at the contest when you can't make test flights. You can sit back, keep your "cool" and decide what changes to make on the next flight with pretty fair assurance of being right.

Although propeller efficiency can be deduced from the data in Fig. 1, Fig. 2 shows velocity vs. RPM curves that must be taken simultaneously with the altitude info in Fig. 1. The curves of Fig. 2 are somewhat idealized and are based on only three data points, but they will show the basic method. Propeller advance angle is figured as shown in Fig. 3, where the triangles represent the conditions of the data points in Fig. 2. Fig. 3A was taken during initial climb, 3B at the start of cruise and 3C 10% of flight time before touchdown. (19 x 32 prop use

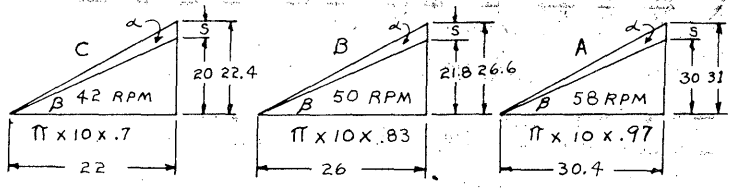
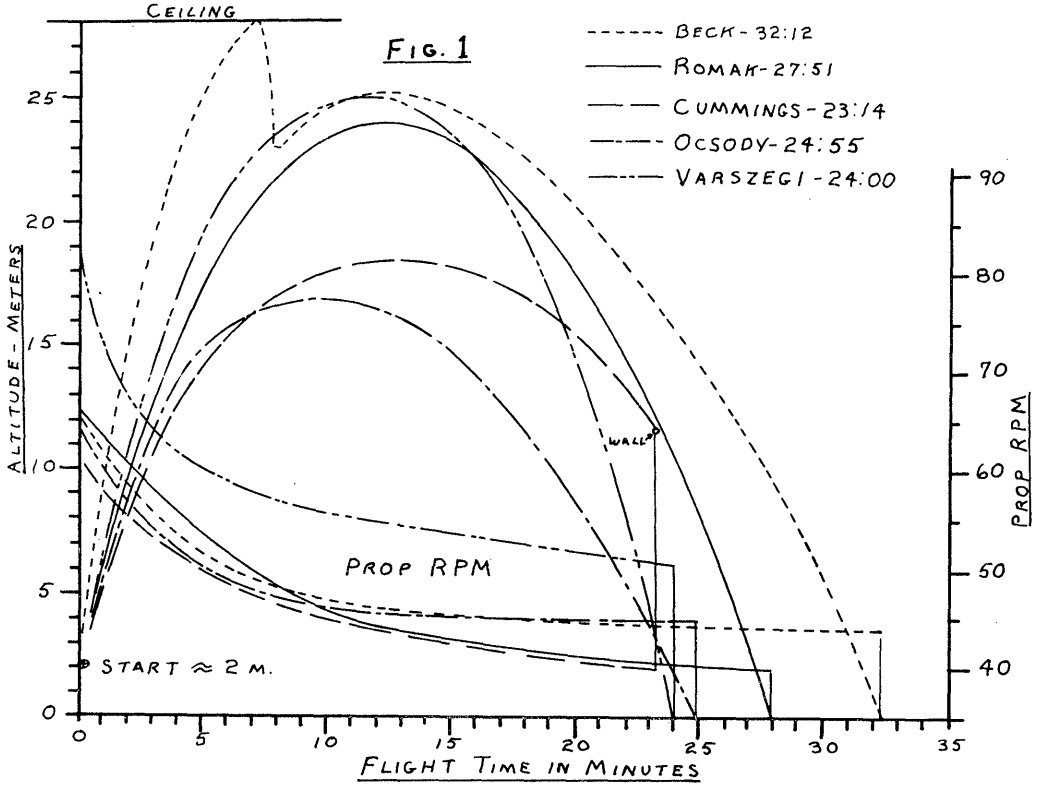


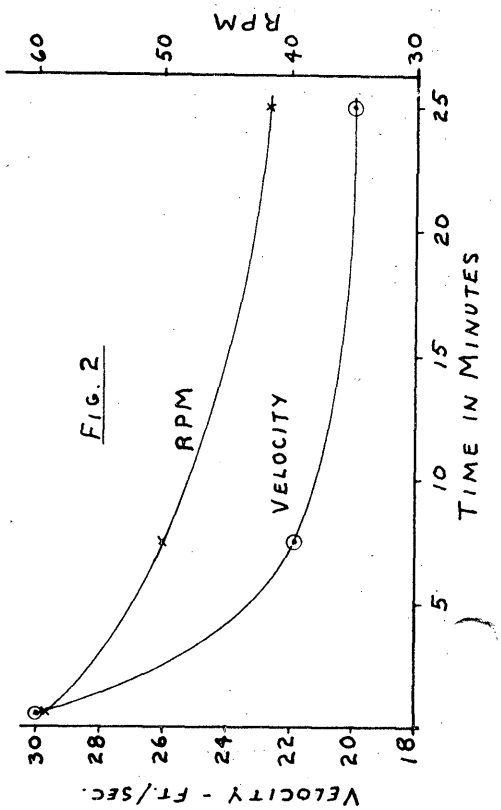
FIG. 3

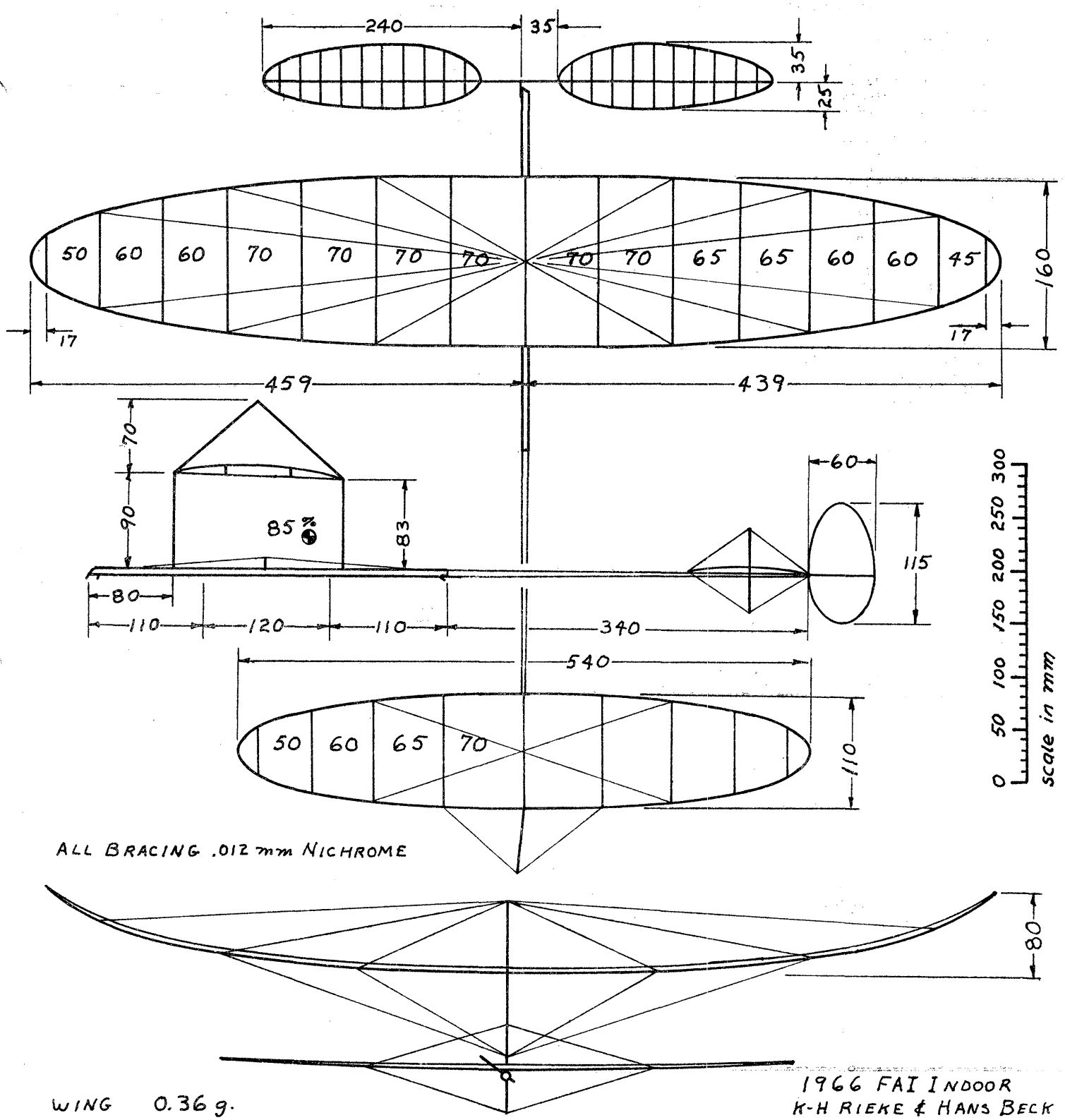
Referring to Fig. 3C, the base of the triangle represents the circular distance travelled by the blade element at 5" radius (x Dia. or x 10) multiplied by the rev./sec. (42 RPM = .7 RPS). The other side has two dimensions: Model velocity (20 ft./sec) and theoretical prop advance (RPS x prop pitch or .7 x 32 = 22.4). The difference between these two is propeller slip; the angular difference ( ) is the angle of attack of that blade element. Tan V/v (20/22) is the advance ratio which can be converted to advance angle by using trig tables.

How to obtain this info? Data in Fig. 1 can most easily be taken by two men; one recorder and one timer. Altitude is estimated at appropriate intervals and recorded; RPM is measured by timing ten revolutions and recording the time which can be converted to RPM later. At Debrecen, the altitude measurement was simplified by having three observation levels. At "plain" sites a balloon with calibrated string can be raised to the model's altitude and the distance read off the string. Velocity is harder; an estimate of flight circle diameter is made and the time for one circle is recorded at appropriate intervals. Now is the time to start making flight tests; the team selection program is in full swing and the Finals will be tougher than ever. We have had a vast backlog of empirical information to guide us with 90 cm. models, but many European fliers are far ahead of us in 65 cm.

Quite probably some reasonably simple items of eq ment can be designed to simplify simultaneous measurement of flight circle diameter and altitude. Certainly, standard surveying equipment could be adapted, but it might be cumbersome and certainly is expensive. Suggestions for such equipment are welcomed.





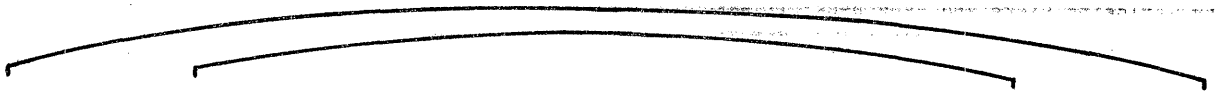


ALL BRACING .012 mm NICHROME

WING	0.36 g.
STAB + FUS.	0.48 g.
PROP	0.15 g.
	0.99 g.
MOTOR	1.09 g
TOTAL	2.08 g

PROP 480 ϕ 840 PITCH
POWER 400 mm LOOP 1.4 x 1 PIRELLI
1750 TURNS

1966 FAI INDOOR
K-H RIEKE & HANS BECK
32:42 28 m. CEILING
DEBRECEN, HUNGARY
FLOWN BY HANS BECK
WORLD CHAMPION



INDOOR RULES

Autogyro Rules Clarification

An official protest against an autogyro flight made at Lakehurst in September was referred to the FF Contest Board to be resolved. The protest was denied, which had the effect of confirming the following interpretation of Sec. 8.12 with regard to flight surface areas for indoor autogyro: The wing area plus the rotor area (wing area must not exceed the rotor area) constitutes "supporting surface" and the stab area may not exceed 50% of this total. If the stab area exceeds 50% of the total wing and rotor area, the excess must count as wing area. In addition to the above clarification, a special advisory committee is considering a modified wording for Sec. 8.12 which will be easier to interpret.

RC Rules Proposal

Some of you may be members of an AMA Charter Club; if so, your club received a copy of an RC rules proposal for your consideration. This is part of a test to see if Charter Clubs will take an active part in rules making if given the chance. If your club has no RC fliers and no opinions on this matter, the club should still respond to AMA HQ giving this information. If insufficient response to this issue is made, it may well scuttle the idea of Charter Clubs taking part in rules making. Be sure this matter is discussed this month; deadline is Feb. 1, 1967.

NEWS FROM AROUND THE WORLD

ILLINOIS - CHICAGO

Chicago area fliers lost access to the Madison St. Armory last year when the Illinois National Guard started intensive training. The long drouth appears to have been broken by Art Christenson's efforts to get the 55th St. Armory. Although the final contracts haven't been signed yet, plans are being made. Contact Art at 825 Bonita, Elk Grove Village, Ill. for final details.

MASSACHUSETTS - M.I.T.

A significant amount of activity is building up at the MIT Armory (corner of Mass. Ave. and Vassar St. in Cambridge, Mass.). The Armory is a 42' site, and future sessions will be held on Feb. 18, March 18, April 15 and May 6; flying times from 4:30 PM to 8:30 PM. Contact Pete Young, 362 Memorial Dr., Cambridge, Mass. 02139.

MISSOURI - ST. LOUIS

Indoor fliers in the general vicinity of St. Louis contact Dick Ganslen, 917 Blackberry, St. Charles, Mo. for details about flying sessions and contests. Dick has done a tremendous amount of work locating sites and stirring up Indoor activity; we all owe him thanks.

OHIO - CLEVELAND

The world's largest indoor contest is scheduled for Jan. 22, 1967 with Cat. II Record Trials and flight testing to be held on Jan. 21. The site is the 80' high Public Hall in Cleveland, located at Sixth and Lakeside in downtown Cleveland. 92 permanent awards plus 10 perpetual trophies will be awarded to fliers in 6 age groups (AMA Jr. class is split into 4 age groups). Send to Cleveland Press, Cleveland, Ohio 44114 for entry blank.

OKLAHOMA - TULSA

The Tulsa Glue Dobbers, one of the largest and most active clubs in the nation, are expanding club activity into indoor flying. A highlight of the January meeting will be a "challenge" IHLG match between a team of C/L members and RC members. Which is better? Button pushing muscles or whipping muscles? Time will tell! The FF members are keeping mighty quiet - afraid they will be shown up?

VIRGINIA - HAMPTON

The Brainbusters, besides their postal activity which is going on this month, have set up dates for FAI Trials and AMA contests. On Jan. 22 they will hold FAI Trials, and on Feb. 26 an AMA contest. For more details and site info, contact Hal Crane, 4002 Buchanan Dr., Hampton 23369. "Heavyweight Hal" (as he signs himself) has done some very good low ceiling flying with heavy models. His Gold NIMAS Award (13:56) was done with a 65 cm. ship weighing .046 oz.; the site was the 20+' Willis School.

STATE OF THE ART

The model of the month is the World Championship model designed by Karlheinz Rieke and Hans Beck; it was capably flown by Hans at Debrecen, Hungary, last summer. Major changes from Rieke's model are: CG from 70% to 83%, motor stick length from 364 mm to 340 mm, and an 11% increase in stab area. Flight trim info does not appear on the drawing, but the wing was "twisted" (washin in the inboard wing and washout in the outboard wing). Also, there was some stab tilt, I believe. This model had a very rapid climb (see curves elsewhere in this issue) with a very tight flight circle. The tight circle coupled with a high cruise speed (compared to American model practice) quite effectively overcame a significant amount of drift caused by the sunshine on the floor from the skylight roof. As space permits, the story of this model's development will be presented. We also hope to bring you an article on how it was trimmed.

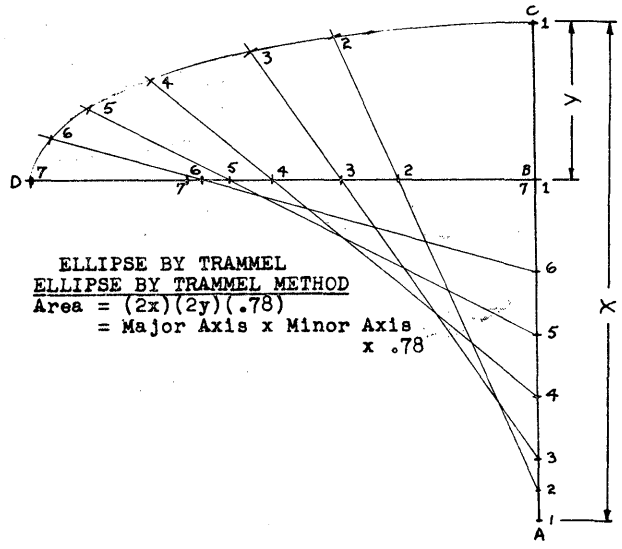
DESIGN FOOTNOTES

Surface Outlines

With the change in FAI Indoor Model specs from 90 cm. wingspan to 65 cm. span, we all need to design new models. Two of the most popular outlines can be constructed mechanically with relative ease, as shown in sketches below.

The time-honored ellipse can be constructed with a straight-edge and dividers as shown in Fig. 1. Construct line DB perpendicular to line AC; segment BC is equal to one-half the root chord of the finished wing and segment AC is equal to one-half the span. Using the dividers, mark off the distance AB from points on segment AB to points on segment BD, and number corresponding points on the two segments. Construct lines thru like-numbered points and extend them past segment BD; mark off distance BC on each line. This creates a third point on each line and these points are joined in the ellipse shape with the aid of a french curve. The resulting figure is one-quarter of the finished outline; the area of the entire wing is shown in the formula.

If you want more area for a given span and chord, use the parabolic development shown in Fig. 2. Construct a rectangle with sides equal to half-span and half-chord. Divide two sides into the same number of equal parts, and number the points in sequence as shown. Join like-numbered points with a straight-edge as shown and use a french curve to smooth the line segments into the outline. The area of the complete wing is given by the formula in the sketch; for a good discussion of how the .833 is derived, see Ray Harlan's article on page 206 of the 1959-61 Zaic Year Book.

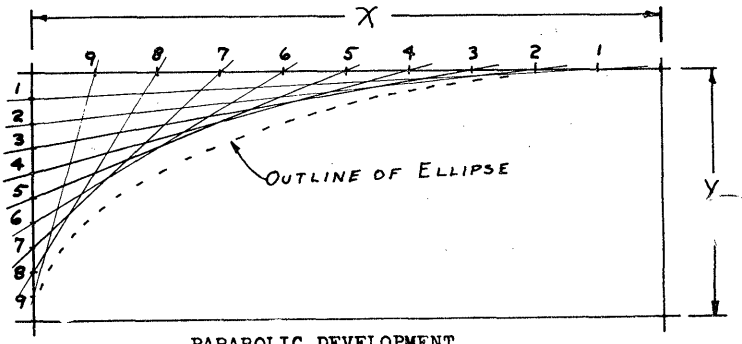


ELLIPSE BY TRAMMEL

ELLIPSE BY TRAMMEL METHOD

Area = (2x)(2y)(.78)

= Major Axis x Minor Axis x .78



PARABOLIC DEVELOPMENT

Area = (2x)(2y)(.833)

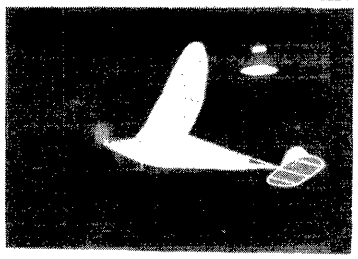
= Major Axis x Minor Axis x .833

MANHATTAN CABIN REVIEW - by Ed Whitten

Because certain important attention has been focused on the Manhattan Cabin Formula Model, it is rather important that I take time now to study it carefully and see WHY it came into being, WHAT it is now, and HOW it should be improved.

The Manhattan Cabin was intended as a genuine indoor model somewhere between a true Flying Scale and the present Indoor Cabin. Basically, it has a minimum TOTAL weight including rubber, a BOX incorporated in the fuselage to maintain cross-section, and a wingspan limited to fairly small size.

Percy's prototype ——→ had dropable L.G. which not allowed in rules.



Whitten's 'Riversider' designed for beginners has flown 2:47.7 at Lakehurst; 1:14 under 19' at Syosset. Prop has adjustable pitch; wingmounting struts plug into tubes. ——→

Just what should be the design limitations to achieve such a model? The writer considered airframe minimum weight total weight, minimum total weights from .2 oz. to .75 oz., maximum wingspans up to 30" with and without chord maximums, stabs with and without maximums, fuselage boxes of all sizes, limitation to paper covering or open to microfilm, length of fuselage, and on and on.

It finally jelled into a small model with a full fuselage that would weigh enough to allow considerable variation in design...from a beginner whose model probably would simply weigh enough to meet the minimum to an indoor expert who could build a light airframe and use up to 2/3 of required weight in rubber. Five minute flights were to be expected without difficulty by the expert. One thing was certain, however; that the first proposed rules were considered only a starting point towards developement of a popular model.

Bud Tenny ran a condensation of these first rules in an article in the November 1965 issue of INAV. In quick review these were a minimum TOTAL weight including rubber of .3 oz., a minimum BOX incorporated in fuselage of 2 x 3 x 5 with no maximum fuselage length, a monoplane only with a maximum flat span of 20" with max. chord of 4", a max. stab span of 8" with max. chord of 3½", model to ROG with min. wheels of 1" diameter. There were other restrictive rules intended to limit model to a somewhat Curtis Robinish look and to cut down arguments with Contest Directors.

Going back, the writer now feels these original rules too restrictive and could be resummed up by as little as:

1) Min. TOTAL weight (including rubber) of .3 oz.
2) Max. wing span of 20"
3)Min. Fuselage BOX of 2 x 3 x 5
4) ROG with min. wheel diameters of 1"

with possible revisions of:

a) Min. Fuselage BOX of 2 x 3 x 4
b) Max. Fuselage length from prop bearing of 20"

But where do we go from here? Before anyone crystallizes in his mind what a Manhattan Cabin is...and on that basis accepts or rejects it...we need a stack of comments, criticisms, suggestions and models actually built and flown. Let's review what is already at hand.

Dick Percy possibly built the first Manhattan Cabin. It ran heavy, possibly .5 oz. My first was designed heavy enough for beginners to handle, since there was comment afoot that the Manhattan would be a suitable beginner design. Construction was mostly 1/16 sq., superfine tissue covered, and sported cabin windows and wire landing gear. And HEAVY it was, in fact running .74 oz. with the rubber used on its 2:47.7 flight. Not really an indoor model and not really what was wanted. Furthermore, it is not compatible with microfilm. My current design approaches .1 oz. airframe with condenser covered fuselage and microfilm covered wing and tail and as close to .2 oz. rubber as possible to make the min. weight of .3 oz. total....truly an indoor model and as compatible as any microfilm model is to another.

What do others say? In review it must be pointed out that many have taken the min. .3 oz. to mean airframe only and not the correct interpretation of total weight including rubber. It makes a whale of a difference.

FRED WEITZEL wrote..."As for Manhattan Formula, I might build one, but I'ld like some leeway. How about a smaller fuselage cross section - say 1½ x 2? Also, I think the weight requirement is too high. Actually, you don't need a weight limit; simply require tissue covered (condenser paper). I think your idea of measuring the fuselage cross section by the BOX method is a good one. It prevents the devious gimmicks used so often in Cabin to get around the fuselage cross section rule; and it looks like it is the only way to do so. A requirement for Average Fuselage Cross-Section might do it, but then again....?" .... Later Fred wrote...."I thought the .3 oz. you mentioned a while back referred to airframe alone. This seemed high, as I have Scale jobs that are as light as this. The .3 oz. sounds all right for Total Weight (including motor), though. Actually, 'my idea' of Cabin would be: 1) Paper covered (Condenser Paper), 2) No weight restriction, 3) Flown in high ceiling (at least 50'), 4) A better cross-section rule (possibly like your BOX idea). This, of course, is a bit removed from the type you've been working toward, and is an Ideal, not necessarily the most practical."

PLEASE WRITE..... Your comments...both pro and con... are earnestly wanted. Send them to Bud Tenny or directly to Ed Whitten, Box 176, Wall Street Station, New York, N. Y. 10005.

Praise it or tear it apart, but let's hear from you! Give us your suggestions for improvement and your reasons. Send sketches of proposed designs.

Have you made a Manhattan? Send pictures and tell us all about it.

Think this style of model over seriously...and then write to us.

HOWARD E. JOHNSON wrote..."Regarding my reactions to your Cabin model, I would say that these are entirely favorable.....Perhaps this would be exactly the shot in the arm that Indoor Cabin needs."

FRANK ZAIC wrote..."I see that your Formula is getting attention and may build up into a regular event. It is a good handicapper."

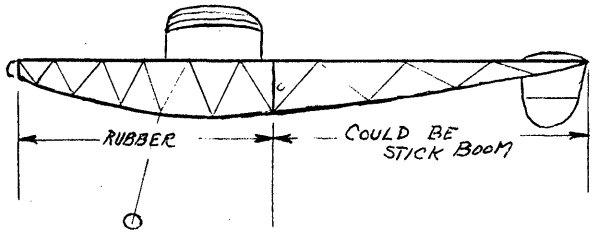
ED FRANKLIN in a telephone conversation..."Being primarily an outdoor free-flight modeler, I only build for indoors for the fun of it. In the old days I used to fly Mic and recently I even flew FAI. I like to try a little of everything nowadays. If I am going to build a fuselage model for indoors, I'ld rather build a flying scale than a model like the old Commercial."

DICK PERCY wrote..."The 2 x 3 x 4 Box could, as you said, be easier and work just as well, but that 2 x 3 x 5 is an interesting challenge in design as to what to do with the extra 1" in relation to max. wing chord."

BUD TENNY wrote..."The Manhattan model, intended as an intermediate between indoor scale and the present indoor cabin classes, is still under experimental developement as to final rules and I have indicated that the major item to increase compatibility with present indoor events is a reduction to a minimum of .1 oz. weight from present .3 oz."....and Bud later wrote "My comments re Manhattan weight were solely to make it less likely to totally wreck conventional indoor models. You are right; .1 oz. would restrict design considerably."

MAX CHERNOFF wrote..."As far as the Manhattan Formula is concerned, I can see that this is a good vehicle for a young modeler or an adult who is not used to the very light construction of the average high performance indoor model. The minimum weight restriction of 0.3 oz. would not encourage braced wings and does not require the use of light condenser paper. In fact, the wing spars could be 1/16 sq. and the longerons of the cabin 1/16 sq. making for a very sturdy model. The covering material could be the very light superfine that Frank Zaic has (or had) or the STG tissue mentioned in their catalogue. My one reservation about the event is that more experienced modelers might not be inclined to like being restricted to a minimum weight or a maximum tail area.

"What I feel would encourage the proposed activity are details of existing or proposed designs. The Platapuss Duck (see Oct. 1966 INAV) drawing is very interesting, but leaves out the information required to build it,such as wood sizes, weights and propeller detail. Also, the sketch prepared inhibits the designer as far as fuselage length. I could very well build a design thusly:

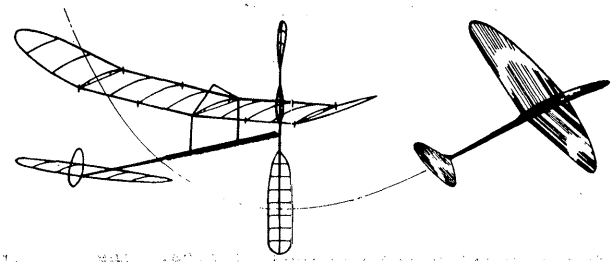


and achieve a more stable model.

"My particular preferences for the formula would include the following revisions: 1) Minimum weight .2 oz., 2) Average wing chord 4" allowing for tapered wings, 3) Average tail chord $3\frac{1}{2}$", 4) Wood blades for props (no built up paper covered structure). My comments are not based on actual experience, and could easily be tempered by exposure to the event."..... Later Max wrote "Thought it over considering weight of 'B' Paper Cabin is around 0.1 oz.total and suggest Manhattan min. Total weight should be 0.2 oz. or min. Airframe weight should be 0.1 oz. with min. Fuselage Box 2 x 3 x 5."

The Voice of N.I.M.A.S. FEB·1967

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

DENNIS BAUGHMAN, 25456 Doncea Dr., Warren, Mich. 48091
ART CHRISTENSEN, 825 Bonita, Elk Grove Village, Ill.
GEORGE DELAMATER, c/o Houdry Process Co., Box 427 Marcus Hook, Pa. 19061
ANNIE GIESKIENG, 730 Moore #2, Lakewood, Colo. 80215
EUGENE C. LARR, 14000 West 25th Pl., Golden, Colo. 80401
HENRY M. NIXON, 18 Stonycraft Rd., Wayne, N. J. 07470

Honorary Members

EGIZIO CORAZZO, Via F. Bonaini 4, Firenze, Italy
LICIO FANFANI, Via G. Fracastoro 2, Firenze, Italy

NFFS

If you haven't renewed your NFFS membership yet, or joined for the first time, act now! Many long-time NIMAS members are also devoting their considerable talents to getting NFFS rolling: Hardy Brodersen, Dick Black, Carl Fries, Pete & Charlie Sotich, Dave Linstrum - the list goes on and on. Send $3.50 (make checks payable to NFFS) to Hardy Brodersen, 4729 Walnut Lake Rd., Birmingham, Mich. 48010.

One NFFS committee which may become very important to the future of free flight is the NFFS Postal Meet/Small Field Events committee now headed by Ed Whitten. If any of you have suggestions or ideas for small field events, please send these to: Ed Whitten, P. O. Box 176, Wall St. Station, New York, N. Y. 10005 or to Box 545, Richardson Texas 75080.

FAI INDOOR REPORT

Special Bulletin

The proposed steering method outlined in the Jan. '67 INAV has been approved for use in Team Qualification Trials at the local level. CD's are requested to comment on this steering method if it is used at their Trials. The resulting comments will help decide if the proposal will be modified, and will give some experience with the proposal before it is again presented to CIAM. The existing steering rule prohibits steering with anything except the balloon and this is impossible to do if the model is closer to the ceiling than two balloon diameters. If an international record attempt is in progress at any Trials, the existing steering rule should be enforced as closely as possible. Intermittent contact between balloon and model during the ten second period was permitted at the World Championship, and it was strictly enforced that the contestant only may steer. If any questions arise about any point of conduct of a Trials, please contact Bud Tenny, Box 545, Richardson, Texas for comment.

Team Selection Trials Schedule

MASSACHUSETTS - M. I. T. Feb. 18, 1967 Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. 01778 (Local Qual.)

TEXAS - Dallas: Feb. 26, 1967 Bud Tenny, Box 545, Richardson, Texas 75080 (Local Qual. Trial) Note! If you plan to attend this Trials, Navy security requires that advance notice be given. Submit your name to Bud prior to Feb. 18, 1967 to be on list.

VIRGINIA - Hampton: Mar. 18, 1967 Bob Champine, 25 Beechwood Dr., Yorktown, Va. 23490 (Local Qual. Trial)

MASSACHUSETTS - M. I. T.: Mar. 18, 1967 Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. 01778 (Quarter Final Trial)

OHIO - AKRON: Mar. 26, 1967 and April 30, 1967 Bob Randolph, 5785 Forest Ridge Dr., N. Olmsted, Ohio 44070 (Local and Quarter Final Trials)

CD Listing

Add the following names to lists which have appeared in Dec. '66 and Jan. '67 INAV:

Pete Sotich
3851 West 62nd Pl.
Chicago, Ill. 60629

Bob Randolph
5785 Forest Ridge Dr.
N. Olmsted, Ohio 44070

FAI Record Procedure

A memo available from AMA HQ details the procedure to establish international records. In brief, any indoor flier holding a current AMA license with FAI Stamp may get a sanction good until Dec. 31 in the year it was issued or until a record is homologated by FAI. HQ must be notified by telephone 48 hours in advance of attempt or by mail 5 days (postmark) in advance. Request is made covering a 3 day period and unlimited attempts may be made during the three days. The attempt must be witnessed by an AMA CD and timed with two watches which have been verified for accuracy. Only the CD and flier need be present, which improves conditions in many sites! The attempt must exceed present record by 2% and claim must be made to AMA HQ within 48 hours. $20 record processing fee must accompany claim; this will be refunded if record is not homologated by FAI. Documented report of record performance, signed by CD must be submitted to AMA within 30 days of notice from FAI that record has been tentatively accepted. For more complete details, get the memo from HQ (title: FAI WORLD RECORD PROCEDURES).

POSTAL CONTESTS!

NIMAS Easy B Postal Meet

The Second Annual NIMAS Easy B Postal meet will be held between now and March 31, 1967 (entries postmarked not later than Mar. 31, 1967). All NIMAS members are eligible and the rules are the same as last year:

1. Wing span - 18" max.; chord 3" max.; paper covered; prop blades all balsa, solid stick, solid boom, no bracing.
2. Use AMA flight rules covering indoor stick; flights must be made at one session only. Entry fee 15¢ per flier, stamps preferred. Special event for Juniors, all other ages combined. Flights must be timed by an AMA member, preferably a C.D.
3. Send entry fee and record of completed flights signed by timer to: Bob Putman, 507 Darlene, Arlington, Tex. Be sure to send the ceiling height of your site with your entry; all entries will be corrected via fudge factor to the highest ceiling height.

RECORDS? MAYBE!

A special note: HQ is using (I think) only single high times for FAI Indoor records, to correspond with AMA practice in other indoor classes except HLG, and to agree with FAI (international) practice. That is, although FAI international contests use best two of six flights for contest scoring, the international record is on the basis of best single flight.

16th ANNUAL GREAT LAKES INDOOR AIR MEET, Jan. 22, 1967
Cleveland, Ohio CAT. I, 80' ceiling
Sr. HLG - 2:14.1, William Schubert
Jr. FAI Indoor - 7:08, Linda Randolph
Open FAI Indoor - 15:38, Bob Randolph

HINTS AND KINKS

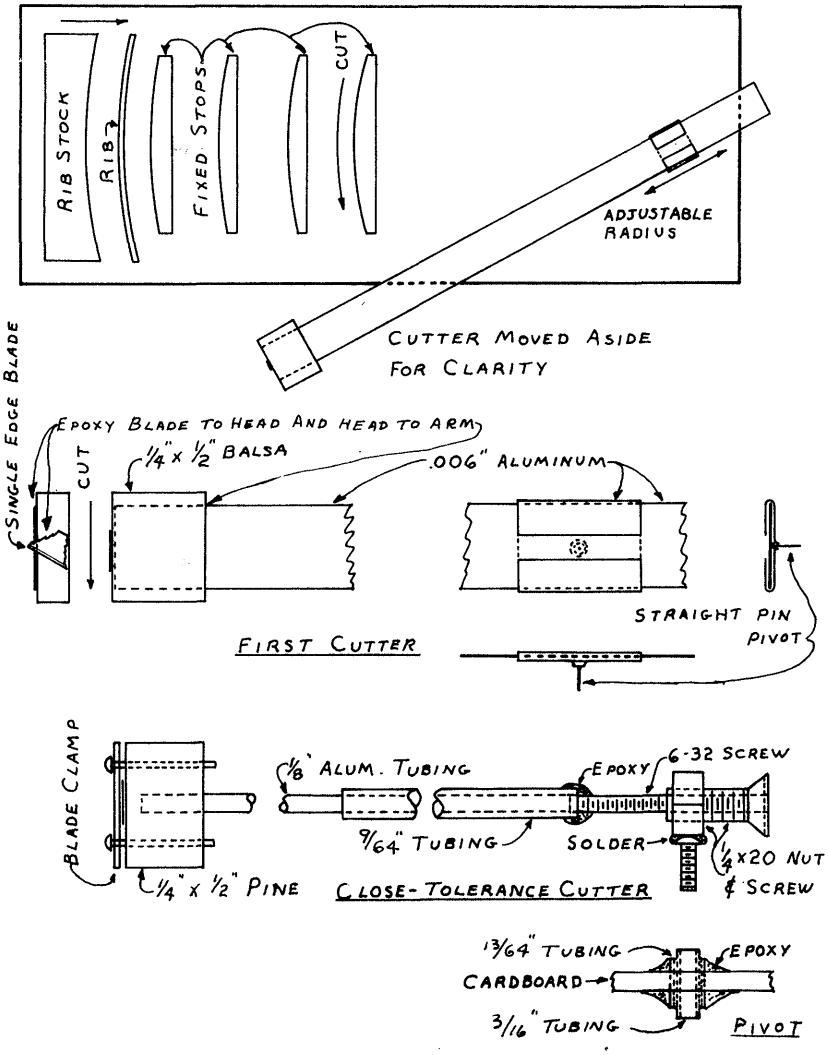
A Rib Stripper

This gadget was developed to ease model building problems of the youngsters; in its present form it is entirely adequate to produce ribs for anyone's models, if you happen to like the arc-type airfoil.

Essentially, it consists of a cardboard (or medium balsa) platform with a hinged cutter and fixed stop-blocks to define the lower edge of the rib. The rib stock is pushed against the stop, the cutter actuated, and a finished rib removed. The cutter arm is adjustable to make different size (or different radius) ribs. The sketch below gives most of the details; two cutter versions are shown. The first cutter is adjusted for both gross radius and fine (rib width) by moving the flexible strip thru the hinge plate and holding the adjustment with plastic tape across the strip and pivot. Disadvantages of this cutter are that the pin hole in the pivot plate gets sloppy (hard to hold consistent adjustment) and the correct rib width is tedious to set up.

The close tolerance cutter has two adjustments - the gross radius is set by using plastic tape to hold telescoping aluminum tubing, and a differential screw sets the rib width. The differential screw is made by drilling a 1/4 x 20 screw and tapping for 6-32 thru the center. The 1/4 x 20 nut is restrained from turning by soldering the pivot screw to it; during operation the 6-32 is also held from rotation. The net result is that the cutter head advances an amount equal to the <u>difference</u> between the pitch of the two threads - about .019" per revolution of the large screw in my model. For finer control, a 1/4 x 28 screw and 6-32 screw would give .005" advance per revolution. In operation the gross radius is set to match the upper edge of the appropriate stop-block and the rib width is "dialed" in. Careful construction of the pivot and close-tolerance taps will eliminate "play" in the system and enable very precise cuts.

Beside the stripper sketch is a re-run of the nomogram designed by Charlie Sotich (May '63 INAV). This is self-explanatory and enables the fullest use of the rib stripper.



STATE OF THE ART

The "Bunker Hill" glider is a consistent design now becoming very popular in the Midwest. Bob Larsh designed the model for the Kokomo Aero Team contests at Bunker Hill AFB, and was a top glider flier there.

The plans give most of the details for the version flown at BHAFB, and Bob has been refining the design for the lower ceilings flown in the St. Louis area. His comment for low ceiling modifications are: Extend the body 5/16" behind the wing. Use the new rudder. Lower the inboard wing panel dihedral to 3/16" and the tip dihedral to 1 3/32". Use <u>very light</u> (4# to 4.5# stock) 3/16" sheet for the wing instead of 1/8" and sand off 1/32". Sand in 5/64" undercamber after the wing is glued on fuselage. Use MicroDyne non-shrink glue. Total flying weight is around 4.5 grams. This set-up turned 31 seconds under a 29' ceiling. Keep everything light!

NEWS FROM AROUND THE WORLD

CALIFORNIA - SAN DIEGO

The San Diego Orbiteers have been holding regular at the Madison High gym, flying HLG, Scale, Easy B and an Easy B sized ROG designed for beginners. For info on future sessions, contact Clarence Mather, 3880 Ecochee, San Diego, Cal. 92117.

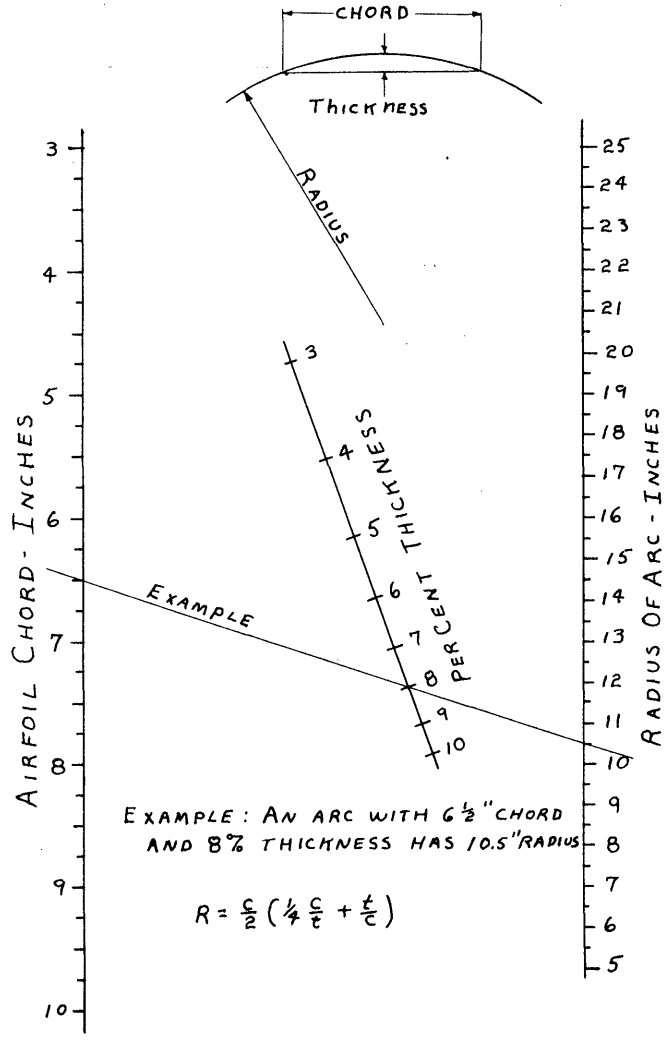
ILLINOIS - CHICAGO

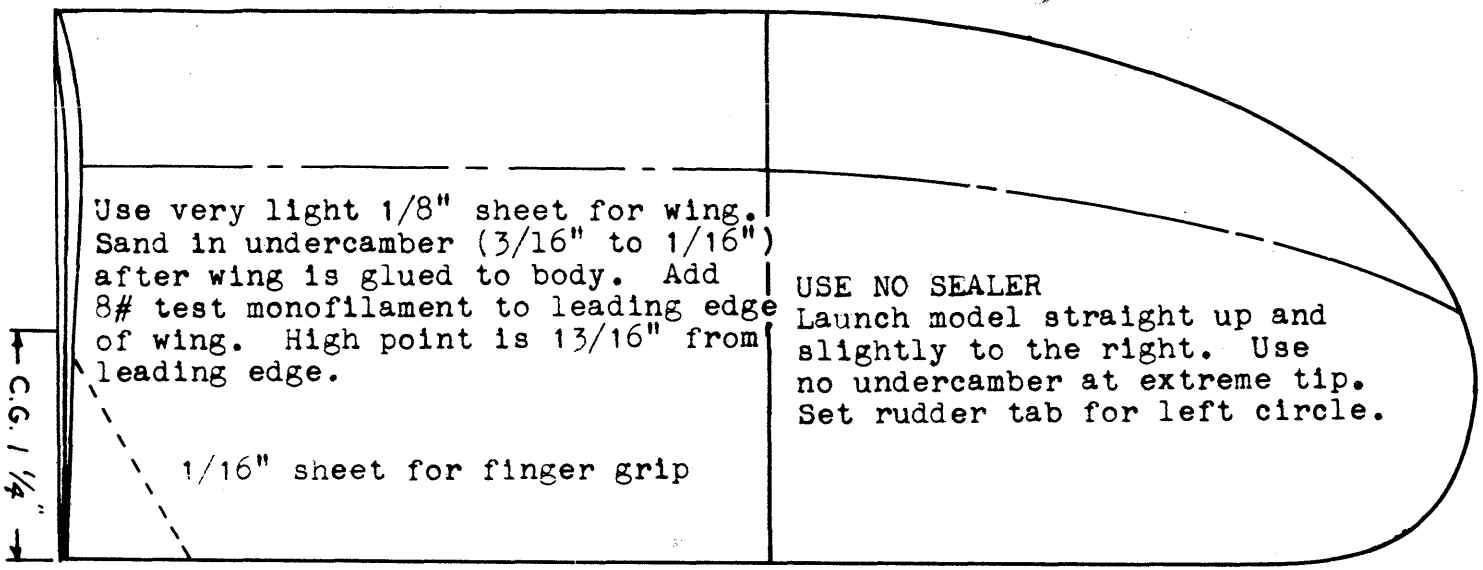
Regular Sunday sessions at the Washington Park Armory at 5200 S. Cottage Grove Ave. in Chicago are being held, except for the interruptions caused by the blizzards. Certain dates are <u>not</u> available: March 12, April 9, April 30, May 14, May 21, June 11 and June 18. Unless something special comes up, all other Sunday dates will be used. Contact Pete Sotich for contest plans and other special info; 3851 W. 62nd Pl., Chicago, Ill. 60629.

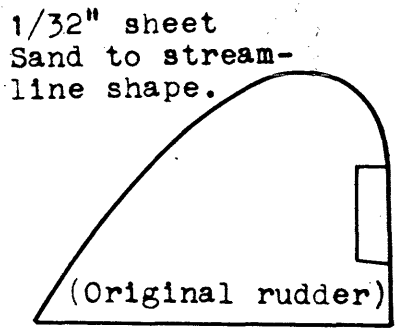
INDIANA - KOKOMO

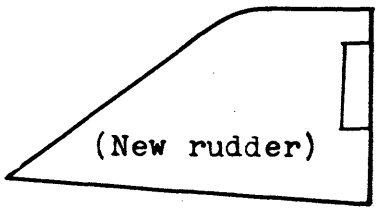
An informal flying session (no contest) will be held at the old stand - Bunker Hill AFB gym, from Noon until 6 PM on Feb. 19, 1967. Most of the flying is expected to center around Easy B, HLG and Scale, but other events (or models) can be flown. Chuck Borneman, 1401 W. Taylor, Kokomo, Ind. 46901.

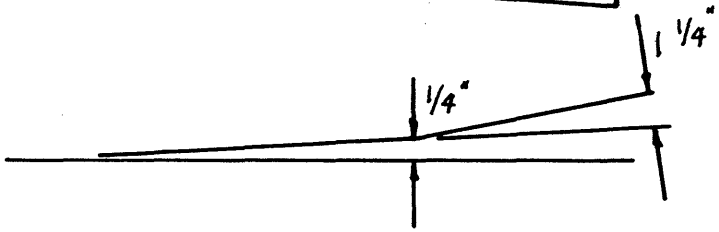
(CONT. ON P.4)

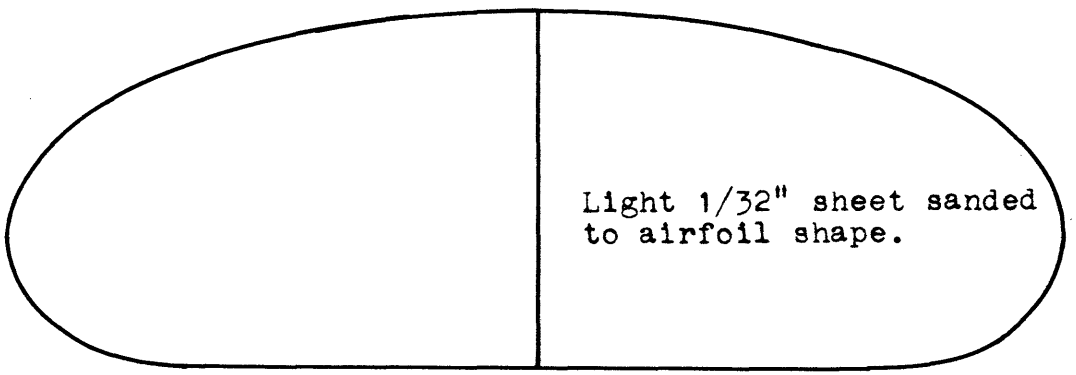


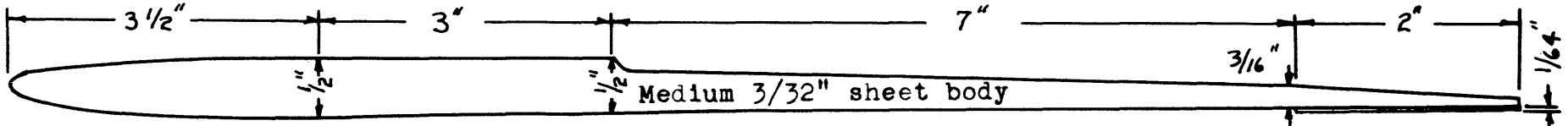












Inexperienced modelers use 1/8" sheet for body.

Trim rear of body 1/64" before glueing stab to give proper incidence.

"BUNKER HILL" INDOOR GLIDER

Best time 0:42.2 in 42'
Weight with clay = .2 oz.
Designed & Flown by Bob Larsh

STRIPPER FOLLOW-UP

The June '65 INAV detailed the basic Bilgri rubber stripper as reported in M.A.N. During 1966 several new ideas in rubber strippers were reported, along with modifications of the basic Bilgri-type approach. This report will give the basic concepts without dimensions. Rubber stripping remains an art, highly dependent upon the cutters available and the techniques used; the more reliable and repeatable the equipment is, the more expensive it is likely to be.

There are two basic concepts in rubber stripping: the Bilgri-type approach where the rubber is pulled past the cutter blade, and the other concept where the rubber is rolled thru the cutters or the cutters themselves roll the rubber thru the machine. In the second approach the rubber remains slack and undistorted except at the instant of cutting (shearing, actually).

Fig. 1 shows Tom Vallee's multi-blade stripper which has given him good results. In a brief trial, it took 20 minutes of set-up time to get four strips in the range I wanted - about average for this stripper regardless of the number of blades. Once the cut dimensions were set, I cut 50' with only a few stops to check the results. The overall variations of the cuts were 6% or less, and this is very good for the pulling type approach. It is a good idea to make the narrow cuts out of the center and to have wide strips on the outside. Also, get 6' to 10' away from the stripper to pull, so stress in the strips will equalize.

George Myers, of the Grumman Engineering Model Society, makes strippers like the one shown in Fig. 2. Specially formed thin aluminum makes a channel for the rubber to run thru, while the blade is pushed thru the rubber and the bottom of the channel. The stripper is held in one hand and the rubber pulled thru with the other hand. George forms the channel as shown in Step 1 and Step 2. In step 1, the aluminum is formed around a rod whose diameter is equal to the perimeter length of the rubber cross-section. For example, 6 mm pirelli (my particular sample) was .243" wide and .041" thick. The perimeter of this strip is (2 x .243) + (2 x .041) = .568, so the rod for step 1 should be about .568" in diameter. In step 2, two rods slightly smaller in diameter than the rubber thickness are used to complete the channel. An old razor blade is forced thru the channel to make the slot in the bottom, and new blades used for each cut.

The basic arrangement used in Fig. 3 was mentioned by Max Chernoff, also of G.E.M.S., and has been used Karl-Heinz Rieke for years. The Rieke stripper used polished hardwood for the base and aluminum strips for the guides and top plate. The Rieke stripper uses a very tight slot in the wooden base to hold the blade. Operation of this device is best with a helper: one person pulls the strip from 8' or 10' away, and the second slowly moves the blade thru the slot to present a fresh cutting edge as needed. A faint crackling sound indicates need for a new edge. My version (Fig. 3) has been intermittently successful, indicating it may be possible to produce narrower strips than my basic Bilgri type stripper. Material throughout was plastic and plexiglas. The .042" thick guides were cut from the sides of a molded plastic box, which had several different thicknesses available in the sides and bottom. My version has been very critical and finicky about blades and technique; perhaps the blade clamp should be on top, closer to the rubber. Anyway, it seems clear that the blade needs to be supported very close to the actual cutting area to prevent blade wander.

Eacn of the above strippers represents some small advantage over the basic model, and they all share the same disadvantages to a certain degree. A good sharp blade (apparently stainless steel blades are inferior to good steel blades for anything except shaving) is a must, and they are getting hard to find. The action of pulling the rubber thru the cutting area causes slightly uneven cutting, which is overcome in Tom Vallee's by the interaction of the blades with each other. The other two types should solve part of this problem by creating the confining channel which prevents the rubber from moving around very much. All three types are limited to a fairly balanced cut - that is, approximately equal width strips on the outer edge. If you can set up Vallee's model, it has the highest yield per unit time, working from either 4 mm or 6 mm pirelli, since one pass thru the stripper does it all. When you use the basic Bilgri-type to go from 6 mm down to .04" or .05 " strips, any irregularities in the first cuts tend to multiply in later cuts.

Next month: three roller-type rubber cutters, all of which were at the World Championship.

MASSACHUSETTS - M. I. T.

The next two sessions at the MIT Armory (corner Mass. Ave. & Vassar St. in Cambridge, Mass.) will be FAI Indoor Team Qual. Trials; Local Trials on Feb. 18, 1967 and Quarter Final Trial on March 18, 1967. Contact Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. 01778 for more info. Flying time 4:30 PM to 8:30 PM.

OHIO - CLEVELAND

The Great Lakes Meet was its usual bustling self, with almost 4000 official flights logged in 8 hours of contest time. A new event for the sub-Junior classes was the AMA Delta Dart, which was designed for youngsters by Frank Ehling. Delta Dart winners were: Dodo - 1:15, Terri Knoblauch; Bantam - 1:16, Doug Masters; Fledgling - 1:00, Warren Holt. HLG Winners: Dodo - 0:40, Martin Murphy; Bantam - 0:47, Pat Murphy; Fledgling - 1:21, Ronnie Ganser; Junior - 1:30, Tom Mills; Senior - 1:55; Open - 1:53, Don Eble. Paper Stick: Jr. - 9:34, Linda Randolph, Sr. - 7:45, Herbert Schubert; Open - 16:44, Dick Ganslen. Mike Stick: Jr. - 7:08, Linda Randolph; Sr. - 14:28, Neil Shipley; Open - 13:09, Pat Green.

OKLAHOMA - TULSA

The ukie boys won the Tulsa Glue Dobber IHLG Challenge with team score of 265.9 sec. vs. 212.9 sec. for the RC team. Bob Hanford won with 0:57.8, and the high Junior time was a tie (0:44.4) between Greg Hibblen and Bobby Hanford. For info on future events, contact Bob Hanford, 3838 South 88th E. Ave., Tulsa, Okla. 74145.

TEXAS - FT. WORTH-DALLAS

The Cliff Model Club Annual Indoor Contest seems to be the first scheduled activity this year, since no one has been able to locate a site to replace the Arlington Rec. Hall site which served so well in the past. The contest is set for Feb. 26, 9 AM to 5 PM, at the Dallas NAS Drill Hall. The events are: Indoor Stick, Paper Stick, HLG, Scale and a Jr. Rubber event (Jetco ROG type for age 12 and under). All who expect to compete must send their name to Bob Wilder, 2010 Boston, Irving, Tex. 75060. The Navy is requiring advance registration, and failure to notify Bob in advance will prevent you from getting on base.

VIRGINIA - HAMPTON

The Brainbusters will hold a Cat. I contest at Willis School from Noon to 8 PM on Feb. 26, 1967. Events: HLG, Paper Stick, Indoor Stick (including FAI) and Easy B. CD is Don Orr, 320-D 73rd. St., Newport News, Va. 23607.

WASHINGTON, D. C.

The DC Maxecutors have scheduled a contest at the Ft. Meade Field House, 9 AM to 4 PM, on March 12, 1967. The events will be HLG, B Stick, Easy B and Indoor Scale. CD is Ernest Violett, 3737 Marlborough Way, College Park, Md. 20740. The Maxecutors also have practice sessions at the John F. Kennedy High School on Feb. 19, Feb. 24, Mar. 17, Apr. 21, May 12 and June 2, 1967 from 7:30 PM to 10:30 PM. Contact William Lee, 802 8th St., Apt. 103, Laurel, Md. 20810 for more info.

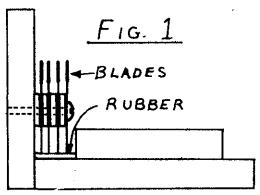


FIG. 1

MULTI-BLADE STRIPPER

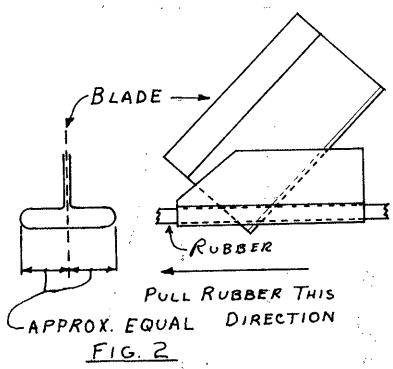


FIG. 2

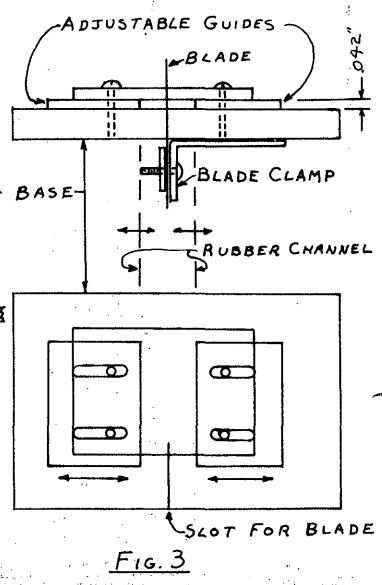
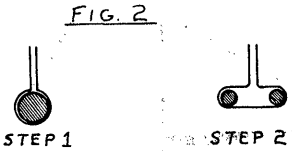
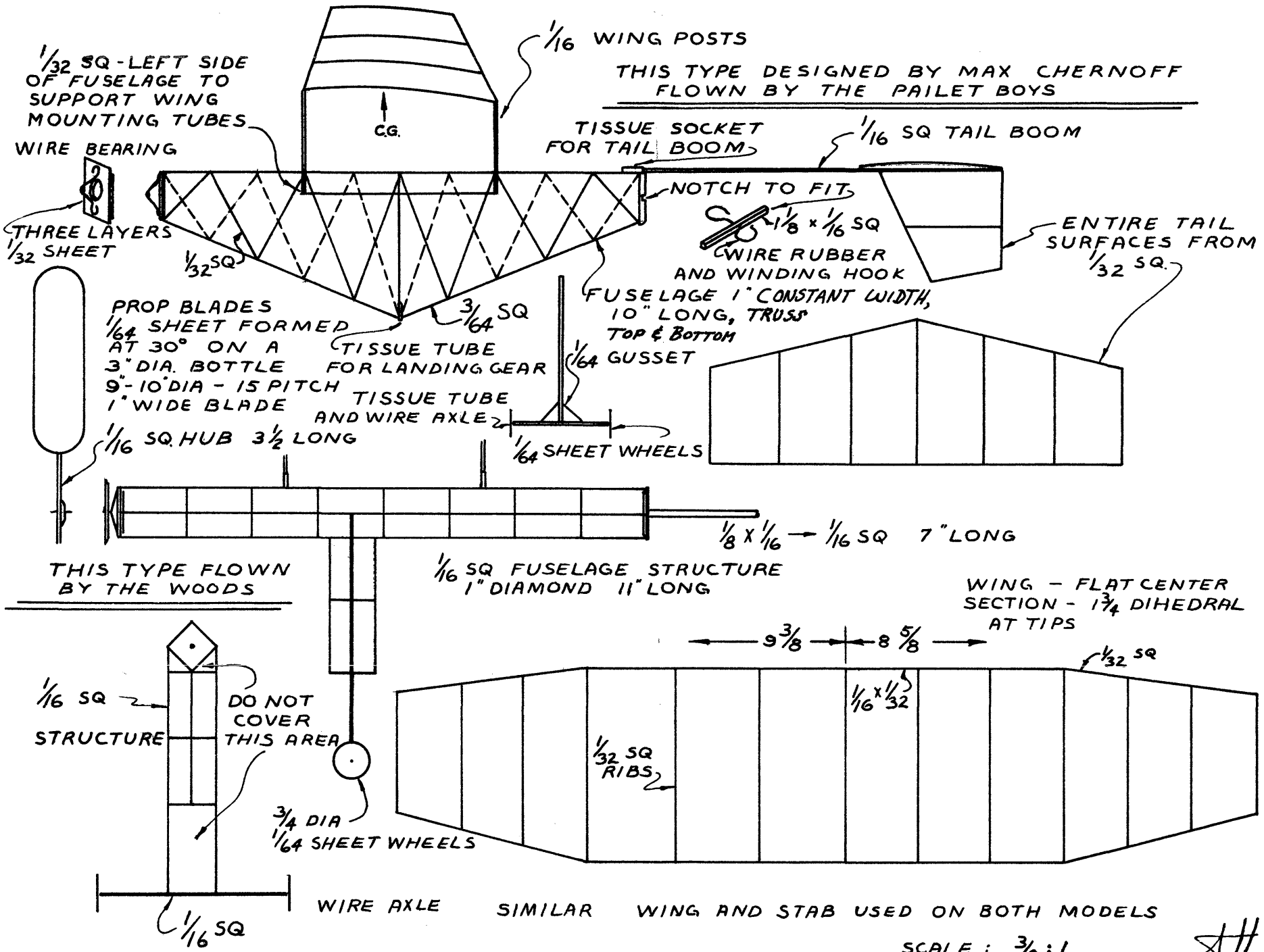


FIG. 3




1/32 SQ - LEFT SIDE OF FUSELAGE TO SUPPORT WING MOUNTING TUBES
1/16 WING POSTS
C.G.
WIRE BEARING
THREE LAYERS 1/32 SHEET
1/32 SQ
3/64 SQ
TISSUE TUBE FOR LANDING GEAR
TISSUE SOCKET FOR TAIL BOOM
1/16 SQ TAIL BOOM
NOTCH TO FIT
1/8 x 1/16 SQ
WIRE RUBBER AND WINDING HOOK
ENTIRE TAIL SURFACES FROM 1/32 SQ.
FUSELAGE 1" CONSTANT WIDTH, 10" LONG, TRUSS TOP & BOTTOM
1/64 GUSSET
PROP BLADES 1/64 SHEET FORMED AT 30° ON A 3" DIA. BOTTLE 9"-10" DIA - 15 PITCH 1" WIDE BLADE
TISSUE TUBE AND WIRE AXLE
1/64 SHEET WHEELS
1/16 SQ HUB 3 1/2 LONG
1/8 X 1/16 - 1/16 SQ 7" LONG
THIS TYPE DESIGNED BY MAX CHERNOFF FLOWN BY THE PAILET BOYS
THIS TYPE FLOWN BY THE WOODS
1/16 SQ FUSELAGE STRUCTURE 1" DIAMOND 11" LONG
WING - FLAT CENTER SECTION - 1 3/4 DIHEDRAL AT TIPS
9 3/8
8 5/8
1/32 SQ
1/16 x 1/32
1/32 SQ RIBS
1/16 SQ STRUCTURE
DO NOT COVER THIS AREA
3/4 DIA 1/64 SHEET WHEELS
WIRE AXLE
1/16 SQ
SIMILAR WING AND STAB USED ON BOTH MODELS
SCALE : 3/8 : 1

MANHATTAN COMMENT

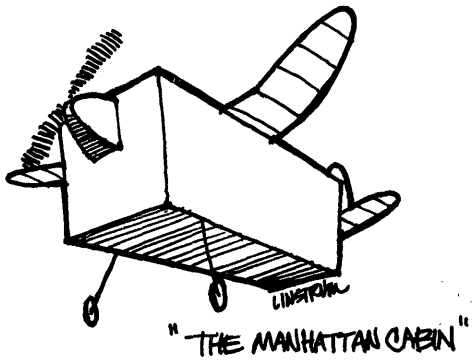
Although the Manhattan's .3 oz. overall weight has been regarded by some as rather heavy, it appears, from correspondence received stemming from last month's review, that some modelers prefer it even heavier.

* * *

BILL GOUGH likes a minimum .2 oz. weight for the model EXcluding rubber, which would make the total weight with rubber about .4 oz. He prefers the smaller BOX size of 2 x 3 x 4 and a maximum length of 20". Bill agrees with Howard Johnson that the Manhattan might be the shot in the arm needed by Indoor Cabin. He also agrees with Fred Weitzel on using a BOX to ensure adequate fuselage size.

JOE POLOSO feels the design is great for both Junior and Expert due to the challenge of a minimum weight. He believes the heavier Manhattan style would not take a Junior long to build, and from there he would go on to Flying Scale. Joe plans to build and fly both.

DICK PERCY feels that the construction of the Riversider is similar to his two Manhattans, and that this is good as it keeps construction in line with the capabilities of beginners. He believes an all-tissue machine has a better chance of bringing new builders into the fold. (Such construction, mostly 1/16" square, could be brought about by requiring a minimum total weight of about .75 or sans rubber of .40.)



DAVE LINSTRUM writes that he plans to build a Manhattan Formula model for the March McDonnell Indoor Meet and hopes to expand local interest, which has a big potential, beyond Easy B and HLG. He goes on to poke a bit of fun at 'Da Box' with his cartoon. (It is really not that bad, Dave.)

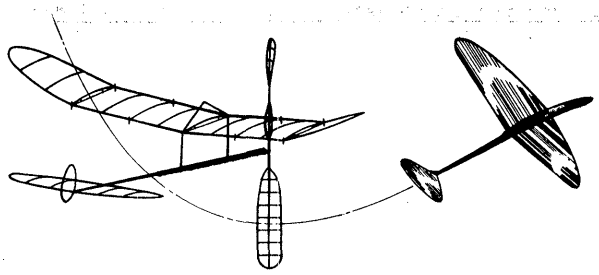
FRED WEITZEL comments "Glad to see your Manhattan Project is making headway and I hope AMA adopts it. Of course, I'm partial to Scale, too....but why not have both?"

* * *

All of your comments are greatly appreciated, and we look forward to receiving many more. Keep them coming!

The Voice of N.I.M.A.S. MAR·1967

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

Our Friends Pass

Sad news spread rapidly through the ranks of NIMAS and NFFS; Dick Black passed away on Feb. 11, 1967. The full impact of this takes a while. We will all remember Dick's concern for everyone's model problems, his willingness to help with any meaningful project and his devotion to model aviation. Those who corresponded with him will remember that he always answered promptly. Those who worked with him on committees and projects will remember his clear-headed, no-nonsense comments which cut right to the heart of the problems at hand. Dick joined NIMAS soon after it was organized; he was a co-founder of NFFS. Much of what each organization is came from Dick's suggestions and hard work. We mourn, but Dick would not have us falter. Let us carry on with a fond memory of him and what he worked for.

Billy Haught, of Milford, Ohio, died on Feb. 7, and we learned of it just as this issue was being started. Billy was an active indoor flier and placed in each Nats he entered. Billy's father, Bill Haught, said that Billy enjoyed Indoor, and had many fine friends in the hobby. It is sad to lose our friends, and we join with their families in mourning their loss.

New Members!

RICHARD HARDCASTLE, JR., 7319 Wise Ave., St. Louis 17, Mo.
BOB HERNDON, 1206 Tom Dee Dr., Brenham. Tex. 77833
RICHARD W. HICKS, 13007 Haas Ave., Gardena, Cal. 90249
ROBERT MASTERS, 8760 Big Creek Pkwy., Cleveland, O. 44136
JOSEPH MATULIS, 6158 South Troy, Chicago, Ill. 60629
HARVEY W. POIRIER, C.L.U., 706 Wolverine Bldg.
Ann Arbor, Mich. 48108
JOSEPH SERVIATES, 4739 Burkhart Ave., Dayton, Ohio 45403
DALE R. WILSON, 2626 Clement St., Flint, Mich. 48504
MARTIN ZABIN, 164 W. Division St., Chicago, Ill. 60610

Executive Council Action

An Executive Council meeting was held as part of the Nats Planning Session at Los Alamitos NAS, California last month. One action of this Council was to rescind their action taken in the July, 1966 meeting which required CD's to pay $10 for their licenses. The new action calls for refunding $4 to any CD's who have already paid $10 this year, and free 1968 membership to CD's who run a meet in 1967. We should all note that the CD position is one of trust and responsibility, central to successful and meaningful competition, and this new action is intended to bolster the level of competition. All CD's should take care to familiarize themselves with AMA regulations and ensure that their contests are conducted in accordance with these rules.

Recent Publications

The April '67 A. M. carries the story, plans and pictures of the AMA Delta Dart - the beginner model which had such widespread acceptance at the Great Lakes Indoor Air Meet this year. It an interesting model and one which may revolutionize beginner model concepts.

The Jan./Feb. '67 Sig Air-Modeler Magazine (SAMM) has a semi-scale Jungmeister, an indoor/outdoor ROG type model, and an article on microfilm gliders. For those who have not seen an issue of SAMM, editor Larry Conover is doing an excellent job in creating a magazine which doesn't push full-house contest ships.

Stop!

A recent issue requested that anyone having mailing containers to fit the various NIMAS films donate same. We now have plenty, thanks to donations from three sources. In the meantine, the films have been on loan almost continouously since December. There are now three of them - #1 is the original which has been circulating for over two years. #3 is an expanded version of #1, on three smaller reels. #2 is mostly of indoor scale models, with a small segment of regular indoor models. There also is a small reel of color shots of regular indoor models - no number. In the planning stage is a set of 35 mm. slides plus taped lecture on pouring microfilm. If this is well accepted, other subjects may be covered also.

FAI INDOOR REPORT

Span Measuring Jig

Attention, CD's! You should measure wingspan of all models entered in all Qualification Trials. A simple way to do this is to purchase a meter stick (90¢, at E. H. Sargent) and make it into giant calipers by making a sliding jaw and a fixed jaw from balsa and spruce scraps. If these just slip on the meter stick, its normal function is unimpaired. Really, you need a meter stick, anyway!

Team Selection Trials Schedule

The listing below shows all dates planned for a given location and lists a contact man. Type of trials, type of site, flying times, etc. can be obtained from contact man.

CALIFORNIA - San Francisco (Cow Palace) - March 12, April 2, April 16, April 30. Bud Romak, 85 Sullivan Drive, Moraga, Cal. 94556
CALIFORNIA - Los Angeles/San Diego - Clarence Mather, 3880 Ecochee Ave., San Diego, Cal. 92117
ILLINOIS - Chicago - Pete Sotich, 3851 W. 62nd Pl., Chicago, Ill. 60629
MASSACHUSETTS - M. I. T. - March 18. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. 01778
MICHIGAN - Detroit - April 23, May 21. Pat Green, 16880 Woodbine, Detroit 48219
MISSOURI - St. Louis - April 9. Dick Ganslen, 917 Blackberry, St. Charles, Mo.
NEW JERSEY - Lakehurst - April 30, May 21, June 11. "Russ" Russo, 143 Willow Way, Clark, N. J.07066
OHIO - Akron - March 19 (chaged from March 26), April 30. Bob Randolph, 5785 Forest Ridge Dr., N. Olmsted, O.
OKLAHOMA - Tulsa - April 22, May 13. Bob Hanford, 3838 South 88th E. Ave. Tulsa, Okla. 74145
VIRGINIA - Hampton - March 18. Don Orr, 320-D 73rd St, Newport News, Va. 23607

Qualification Trial Results

16th ANNUAL GREAT LAKES INDOOR AIR MEET, Jan. 22, 1967
Bob Randolph - 15:38 (Qual. via competition)

BRAINBUSTER'S LOCAL FAI INDOOR QUALIFICATIONS, Jan.21,'67

Hal Crane	10:26	+ 12:41	= 23:07
Hewitt Phillips	12:51	+ 7:19	= 20:10
Bob Champine	8:57	+ 10:15	= 19:12

M.I.T. FAI INDOOR LOCAL QUALIFICATIONS Feb. 18, 1967

James Daley	13:32	+ 15:06	= 28:38
Ray Harlan	12:15	+ 15:01	= 27:16
Harry Lerman	11:50	+ 12:14	= 24:04
Ed Archer	10:28	+ 10:03	= 20:31
Herb Franck	5:45	+ 7:44	= 13:29
Steve Landy	6:36	+ 6:01	= 12:37

DALLAS LOCAL FAI INDOOR QUALIFICATIONS Feb. 26, 1967

Jim Clem	8:57	+ 10:04	= 19:01
Bob Wilder	10:05	+ 7:13	= 17:18
Kristi Tenny	9:04	+ 6:43	= 15:53
Bob Putman	6:40	+ 6:43	= 13:23

The above listing is correct to March 6, 1967, and will be added to as info becomes available.

POSTAL CONTESTS!

Tom Vallee vs. Hampton Brainbusters 19.5' vs. 20' No Fudge

B Stick
Hewitt Phillips - 12:51.1
Tom Vallee - 11:53

65 cm. FAI
Hal Crane - 12:41 + 10:26 = 23:07
Tom Vallee - 11:53 + 9:00 = 20:53
Hewitt Phillips - 12:51 + 7:19 = 20:10

Rochester Ceiling Scrapers vs. San Diego Orbiteers
23' ceiling vs. 22' ceiling

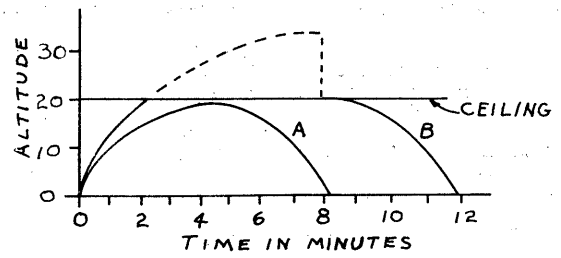
HLG	Club	Time	Fudge	Adj. Time
Clarence Mather	SDO	0:51.1	1.045	0:53.4
Nat Antonioli	SDO	0:50.0	1.045	0:52.3
Bob Clemens	RCS	0:52.2	0	0:52.2
Larry Simpson	SDO	0:46.5	1.045	0:48.6
Jim Mayes	RCS	0:48.4	0	0:48.4
Easy B				
Bob Clemens	RCS	7:33.1	0	7:33.1
Clarence Mather	SDO	7:07	1.02	7:15
Fudo Takagi	SDO	3:50	1.02	3:54.6

Rochester Ceiling Scrapers vs. Hampton Brain Busters
23' ceiling vs. 19.5' ceiling (rubber) and 24.5' (HLG)

HLG				
Bob Clemens	RCS	0:51.7	1.065	0:55.0
Dave Robelyn	HBB	0:53.0	0	0:53.0
Jim Mayes	RCS	0:49.3	1.065	0:52.5
Hal Crane	HBB	0:38.5	0	0:38.5
Easy B				
Bob Clemens	RCS	7:08.5	0	7:08.5
Hal Crane	HBB	6:33	1.087	7:07.7
FAI Indoor				
Hal Crane	HBB	23:39	1.087	25:42
Hewitt Phillips	HBB	20:10	1.087	21:48
Bob Clemens	RCS	16:23	0	16:23

LOW CEILING FORUM

Members of the Hampton Brainbusters have been doing the most of any club in recent months in trying to isolate factors which affect model performance - factors aside from the pure aerodynamics of the design. Hal Crane's experiments have centered on how to "ceiling scrub" in such a fashion as to keep the model centered. No matter how maximum duration is approached, any given model will do more time if it can reach a higher altitude. Hal's sketch below illustrates this: flight "A" shows time vs. altitude for a given model in a certain flight trim, when the model is not allowed to contact the ceiling. Given the condition that the ceiling not be touched, maximum duration in the site for condition "A" comes from careful refinement of the model's rate of sink and other purely aerodynamic factors.



Hal's approach to "ceiling scrubbing" is based on his flight "B"in the sketch. All the flight time shown dotted is time spent on the ceiling, and the latter part of the flight (after leaving the ceiling) is identical with similar parts of flight "A". Hal has tried various types of probes mounted on the model to prevent the model itself from contacting the ceiling, with little success. My own experiments parallel this result. Any probe long enough and strong enough to be effective is likely to deteriorate the cruise below the ceiling, and it is difficult to have such a probe located so that it will always help the model hold its turn. If the model comes out of the turn due to ceiling contact, the next few circles usually take it to the wall. Hal's comment on ceiling scrubbing flight are to the point: "The prop should be the only (or the first) part of the model to touch the ceiling in order to maintain the tight circle. The prop is slowed by bumping the ceiling which reduces the shock on the rest of the model while the rate of climb is high. The climb time may be prolonged when the prop is slowed by the ceiling. There also may be a favorable "ground effect" from the ceiling (I have also observed this - Ed.) when the wing tips are almost touching which would extend the level cruise. When the climb is very gentle the prop touches at least every other revolution. Six minutes of rubbing on the ceiling is hard on my nerves!"

Even with the assumption of optimum rate of sink for type "A" flights, another factor enters the picture for all but very large sites with very low drift. This is the model's ability to recover from contact with walls and obstructions. Speaking of Hewitt Phillips' 16:59 flight, Hal Crane said, "Phillips' model almost always bounced of losing only a couple of feet of altitude." Ernie Kopecky has an A ROG that "has never slid down a wall." So, here is a question for all dedicated Cat. I and Cat. II fliers: What factors of model design and/or trim enhance a model's chances of recovery from contact with walls or similar obstructions?

NEWS FROM AROUND THE WORLD

ILLINOIS - CHICAGO
Subject to the amount of snow falling on any given day, the regular Sunday sessions continue at the Washington Park Armory in Chicago. The National Guard has reserved certain dates; the rest are open for flying except in case of some Guard emergency. The dates not open are: March 12, April 9, April 30, May 14, May 21, June 11 and June 18. Contact Pete Sotich for details of contests or other activity: 3851 W. 62nd Place, Chicago, Ill. 60629

INDIANA - KOKOMO
Besides the regular events, the Kokomo Aero Team will hold a paper airplane event at their March 19 Bunker Hill AFB session. It will be the duration portion of the paper airplane contest as set up by Scientific American, and the event will use the smae rules. Sounds like fun! Contact Chuck Borneman, 1401 W. Taylor, Kokomo 46901 for details.

MARYLAND - BALTIMORE
The Baltimore Aero-Craftsmen will hold their annual indoor meet on April 23, 1967, in the 5th Regiment Armory in Baltimore. Events are HLG, Indoor Stick and Paper combined (class B only), Easy B and Scale. Get entry blank and special rules from Bob Sifleet, 4412 Belvieu Ave., Baltimore, Md. 21215

MASSACHUSETTS - M.I.T.
The March 18 session at the MIT Armory will be the FAI Quarter Final Qualification Trials. Results from Round I on page one. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. 01778

MISSOURI - ST. LOUIS
Dick Ganslen manages to keep things going in the way of flying sessions and contests. Contact Dick at 917 Blackberry, St. Charles, Mo. for details about flying sessions this month; on April 9, 1967 he will hold a contest for FAI, Easy B, HLG and Paper Stick.

OKLAHOMA - TULSA
The Tulsa Glue Dobbers have a site available for regular sessions and for their upcoming contests. Ask Bob Hanford, 3838 S. 88th E. Ave., Tulsa for details.

TEXAS - DALLAS/FT. WORTH
The Cliff Model Club's annual indoor meet went on despite severe up-and-down drafts which occasionally lifted models to glory, but usually dropped them from 25' down to about 58 before turning loose! Bob Putman's Avro won Scale again; 40 points and 53 seconds. Bud Tenny won HLG again, same airplane and almost the same time as in 1966. Bob Wilder's 10:05 won Paper Stick, Bud Tenny won Indoor Stick with 9:21 (Kristi won 3rd against 4 open fliers) and Jimmy Clem won Jr. Rubber (Jetco ROG) with 1:15. This area will have more sessions and contests if the site problem is solved in time!

WASHINGTON, D.C.
The Maxecutors plan Friday night sessions at the 20' JFK High School, 7 PM to 11PM, on March 17 and March 31. Contact Tom Vallee, 444 Henryton So., Laurel, Md. 20810 for details.

A LOOK AT YESTERYEAR

The Sept. '66 INAV hearkened back to the days of the Junior Aviation League in Boston, one of the real pioneering groups in indoor and outdoor flying. This mention in turn caused Ed Whitten to add more names to the list, some of them past or present NIMAS members: Bill Tyler, Johnny Bartol, Bernie Whitman, Bruno Marchi, Ralph Brown, Harry Lerman, Harry Keshishian and Ed Dolby; to name a few of the many fliers who helped lay the groundwork for much of the knowledge we have today. Let us not forget that J. P. Glass was an earlier member of this group - he probably inspired Bob Clary's development of microfilm and suggested the use of wire bracing to lighten indoor models.

STRIPPER FOLLOW-UP

(cont. from Feb. '67)

Three years ago Jim Clem and I discussed methods to roll rubber thru cutting blades to avoid the stretching and variations associated with Bilgri-type cutters. We did nothing but talk until Chuck Wiechard heard of our ideas. Chuck worked diligently until he developed the Roto-Shear seen and used (the hottest loan property in indoor circles ever) by many East Coast fliers. The cutter head is a calender roll, mounted on shafts which set the proper clearance between rollers. The rubber is fed into the roll, which shears it to widths established by the construction of the roll. The entire device is a precision machining operation, but it works very well to produce clean, smooth cuts and uniform cross-section. It may be possible for drawings to be made available of the Roto-Shear, if sufficient interest is shown.(See Fig. 4)

Vilim Kmoch, of Yugoslavia, had a twin roller/cutter device shown schematically in Fig. 5. The width of strip depends upon spacing of the cutters, and the cutting action depends upon having thin cardboard or similar substance between the cutters and roller. Without guides, Vilim's machine produces slightly wavy strips which are parallel and uniform with a good cut. We did not discuss materials, but cutter materials might be critical for long life.

The Hungarian team used strippers with the concept shown in Fig. 6, and my limited observation of its operation left me impressed. As shown in the Front View, two circular sharpened discs are pressed onto parallel shafts one of which is turned via a handle. The cutters are springloaded against each other and the rubber passes thru adjustable guides and is sliced like a meat slicer slices meat - one strip off the left side of the rubber. Both guides were adjustable via micrometer-type screws. One model even had the left guide marked in mm.! This idea appears to be the best of the lot, and the operation was smooth and clean.

The Roto-Shear has the advantage of producing repeatable strips time after time, with the clean cut of the shear or slicing action. The disadvantage for the flier who doesn't know what size of rubber he needs is the lack of adjustment. Also, variations in the width of the base strip will cause variations in the outer edge strips, or even mess up the entire cut if things get out of hand. Vilim's cutter appears to be a good approach, if the problem of guides could be licked. Also, it is some trouble to use because of the necessity to feed strips of cardboard in with the rubber. A continuous cut is possible, by feeding more cardboard strips thru in end-to-end fashion, but no doubt a better material than cardboard could be found. The Hungarian stripper seems to be the best idea of all, in that apparently almost any size of strip can be cut from the left edge of the strip, if the cutters remain sharp. It would take more experience than I've had with it to determine the repeatability, but it seems likely to be very repeatable with practice.

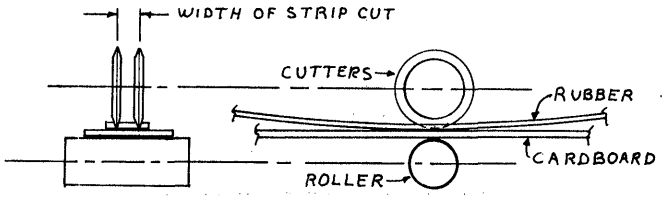


FIG. 5

QUESTIONS AND ANSWERS

38. What is Tail Volume Coefficient and how important is it as a design factor?

Tail Volume Coefficient is a mathematical expression which gives an indication of the stability of a model in flight. If the TVC is too small, your model will be very touchy and hard to handle; if it is too large the model will be too stable and thus lose efficiency. That is, a model with very low stability will be very efficient as long as its flight remains undisturbed; once upset it will have a very long recovery time. Adequate stability is a compromise between efficiency and recovery time; if you could always have perfect air and never hit any part of the building you could use a lower TVC. The formula is below:

$$TVC = \frac{(\text{Stab area})\ (\text{Tail moment arm})}{(\text{Mean wing chord})\ (\text{Wing Area})}$$

The above is considerably simplified, and the floor is open to anyone who wishes to submit a more complete version.

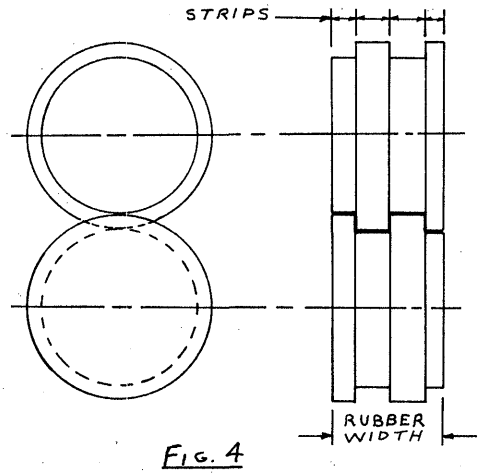
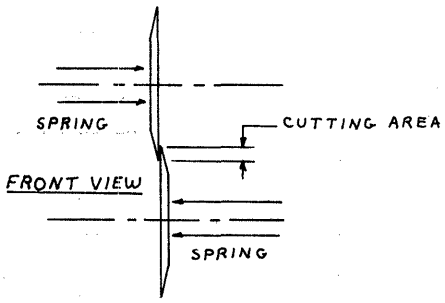


FIG. 4



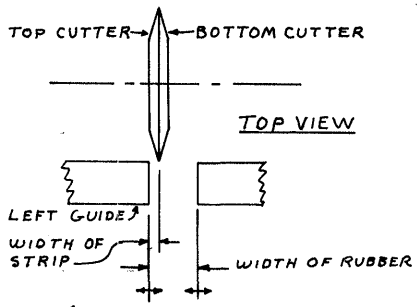


FIG. 6

HINTS AND KINKS

Rubber Motor Hints

Seen at the World Champs: Hans Beck slipped a very small "O" ring onto the rubber before tying the knot. The "O" ring is then arranged so it is at the rear end of the motor, and is hooked over the winder. After winding, the motor is unhooked without loss of turns because the "O" ring will slip right off. It then furnishes a big loop that is easy to hook to the model; and very easy to unhook after the end of the flight. If you want to try this, "O" rings are available from laboratory supply firms such as E. H. Sargent and Curtin. You will have to decipher the sizes in person, since the catalogs use a number system which is related to special fixtures rather than numerical sizes.

Do you have trouble with knots in your motors coming loose? My own personal preference is this one: Tie an overhand knot in both strands together, moistening the rubber before pulling the knot tight. Pull the overhand knot tight, and then tie a square knot on top of the first knot and clip the loose ends. Be sure the rubber is moist while tying the knots; this lubricates the rubber and prevents it from scuffing and tearing. Max Chernoff takes a different approach: Loosely tie a square knot in the end of the motor, lubricate it with a drop of detergent and pull it tight. The detergent permits the rubber to pull down tight without scuffing, then dries out and causes the knot to hold.

STATE OF THE ART

In response to several requests about what types of design trends are coming up in 65 cm. FAI, this month's offering is the results of a survey conducted last month. The information is in the nature of a preliminary report, since many of the models reported on have only been test flown and have not been in competition directly. The notes below the chart indicate model performances to date or other items of interest. Abbreviations used in the chart: Wing & Stab. area - /p = projected area; /f = area flat. CG Location - /r = % root chord; /m = % mean chord. All model & motor weights in ounces and tabular dimensions (keyed to sketch by alphabetical notation) in inches. My thanks to all who returned the info, in case I haven't had a chance to reply. Draw your own conclusions from this info; my own conclusion is that no matter which design trend is followed, the 65 cm. birds are turning in very high performances in low ceilings - often better than 90 cm. models ever did. It may be a very interesting season!

Note 1 - Gull-wing, V-tail model; smaller version (2" less span) did 12:51 in 19.5' site. Best time this model 16:59 in 20.5' site. High prop pitch plus large motor cross-section yields low RPM compared to model speed.

Note 2 - Model holds AMA Cat. II Open FAI record @ 15:38.

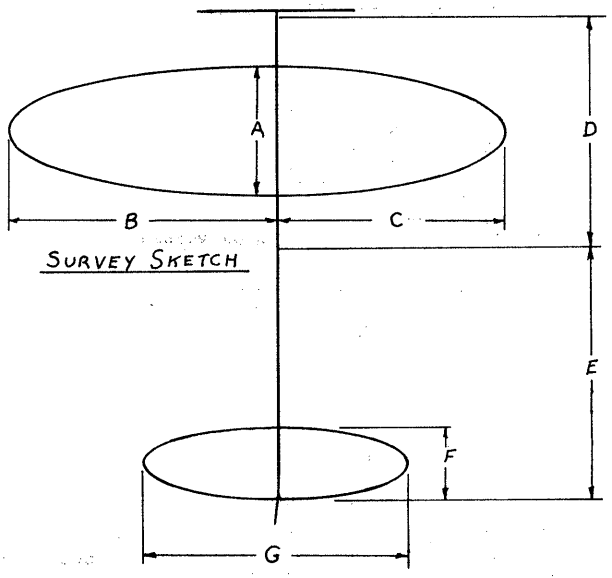
Note 3 - Wing outlines same style as Dram Dip (see sketch).

Note 4 - Quite heavy model, still has done 13:56 in 19.5' site (see Low Ceiling Forum, this issue).

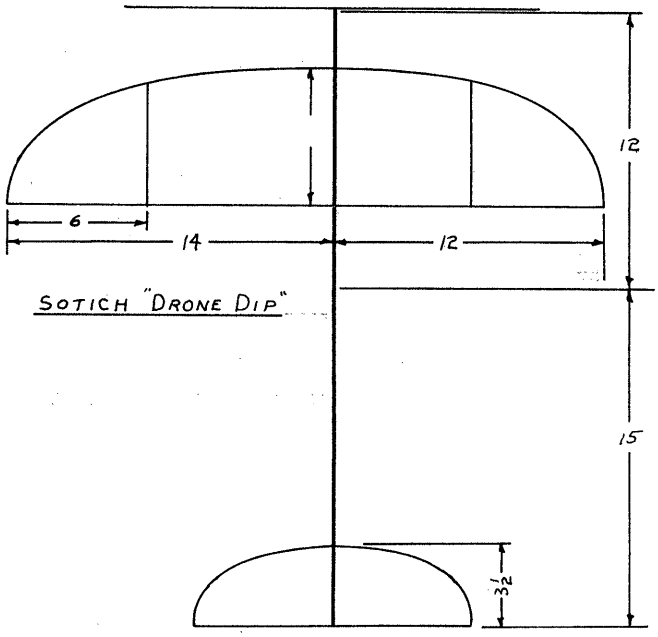
Note 5 - Model's best time 9:20 in 17' site.

Note 6 - Model holds AMA Cat. II Jr. FAI record @ 9:04. Surface outlines and prop outlines simplified per discussion p.3 Dec. '65 INAV. Braced w/dacron sewing thread, boom is part rolled taper, part solid. Prop built as two-piece, assembled on jig to design pitch.

	Phillips (note 1)	Randolph (note 2)	J. Hindes	C. Sotich (note 3)	C. Janke	Ned Smith	Hal Crane (note 4)	Pat Green	Rohrbaugh	Bud Tenny (note 5)	Kristi T. (note 6)
W. Area	74/p	123	112/f	135/f	200/f	100/f	133/p	94/p	125/p	112/p	97/p
S. Area	26/p	37.5	41	35	50	40	55	36	46	43	49
CG Loc.	96/r	65/r	90/r	66/r	60/r	75/m	70/m	83/r	50/r	85/r	75/r
Model Wt.	.035	.0285	.028,.030	.041		.026	.050	.027	.019,.022	.030	.056
Rubber	.053						.045			.046	.055
Prop P/D	16/42	15/25	16/24,/28	17.5/30	18/30	16/27	16.5/27	15,16/30	16/27	16/28	14/28
Dihedral	Gull	Tip	Tip,Ellip.	Tip	Tip	Poly	Tip	Ellip.	Tip	Poly	Poly
"A"	3.75	5.5	5	6	8 1/4	4.8	6	4.6	5 3/4	5.4	6
"B"	14.5	14 3/16	14	14	14 1/8	13	13	14	12 7/8	13.4	13
"C"	11	13 3/16	13	12	12 1/8	12	12.5	12	12 3/8	12.6	11.5
"D"	14	12.5	12.5	12	14	10.5	14	11 1/4	13	11.5	12
"E"	10	10	9	15	14	12	11	9 3/4	11	14	11
"F"	3	4	3.5	3.5	5	3.5	4.5	3 1/4	4 11/16	3.8	4.2
"G"	11	11 1/4	14	12	12	14	15.5	14.5	11 7/8	15	14



SURVEY SKETCH



SOTICH "DRONE DIP"

RECORDS? MAYBE!

AMA HQ has set up four new records for FAI Indoor classes. These records will parallel World Records except that they can be established with an AMA sanction instead of an FAI sanction. That is, these records would qualify (meet all requirements for) as pending World Records if the flier held an FAI sanction, and will be recognized for the four FAI ceiling categories. This is a break for fliers whose site is in-between on AMA ceiling categories and "just right" for FAI categories, and will furnish practice for World Record attempts. More information will be presented when available.

DALLAS AREA LOCAL FAI TEAM QUAL. TRIALS, Feb. 26, 1967
Dallas NAS Drill Hall, Cat. II, 42' ceiling
Jr. FAI Indoor - 9:04, Kristi Tenny
BRAINBUSTER'S INDOOR FAI CONTEST, Feb. 26, 1967
Willis School, Hampton, Va. Cat. I, 20.5' ceiling
Open FAI Indoor - 16:59, Hewitt Phillips*
Open B Stick - 16:59, Hewitt Phillips*

*This single flight was not steered, and thus qualifies for AMA record status also.

TWO CAT. I GLIDERS

If everyone makes connections, page 5 will have plans for two Cat. I gliders, one by Tom Vallee and one by Nat Antonioli. If we miss, refer back to this item next month!

Tom's glider was modified from Norm Getzlaff's glider shown in the 1959-61 Zaic YB. Tom says, Light weight gliders of that design had a tendency to shed wings when tossed to the top of our 38' site so changes were made. After the undercamber was removed it was possible to do good time with a lighter glider flying a tight circle; stab tilt and wing offset were natural developments.

Nat Antonioli says he doesn't recommend the 1/32" sheet wing shown on his original glider, as it doesn't hold up well. His present glider (same design) weighs .17 oz. Nat has been flying in a 22' site, so this will give some idea of proper weight. His times in this site have been about 0:25.0.

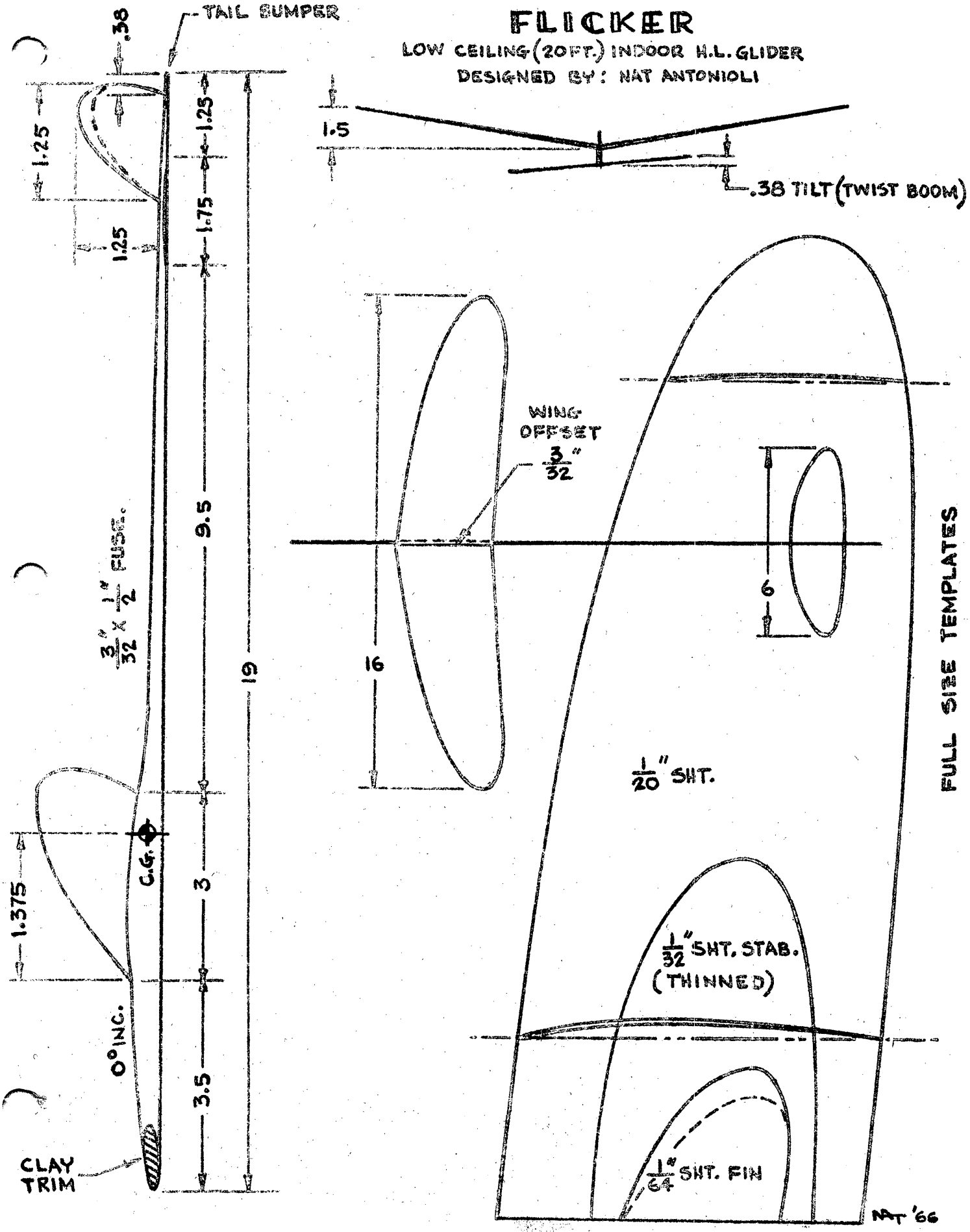
LAST MINUTE BULLETIN

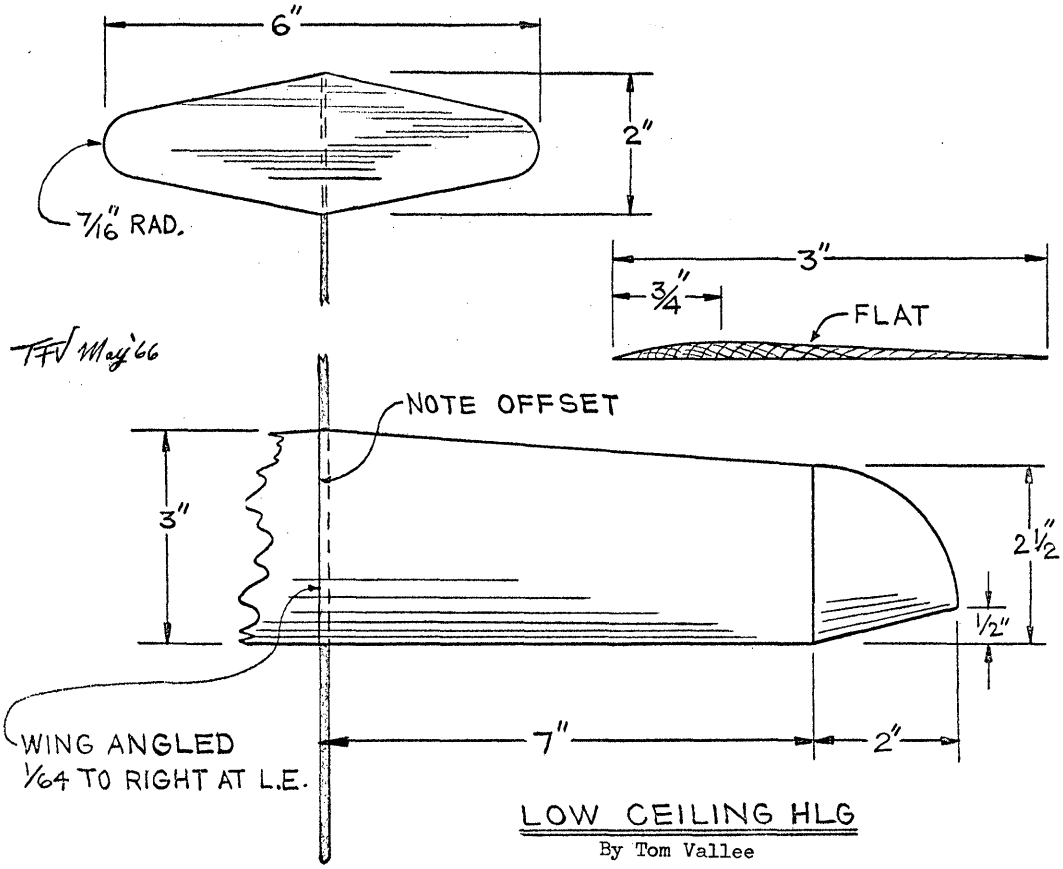
The new records mentioned in Records? Maybe will be FAI Cat. xx FAI Indoor records (insert Cat. number.)

FLICKER

LOW CEILING (20FT.) INDOOR H.L. GLIDER

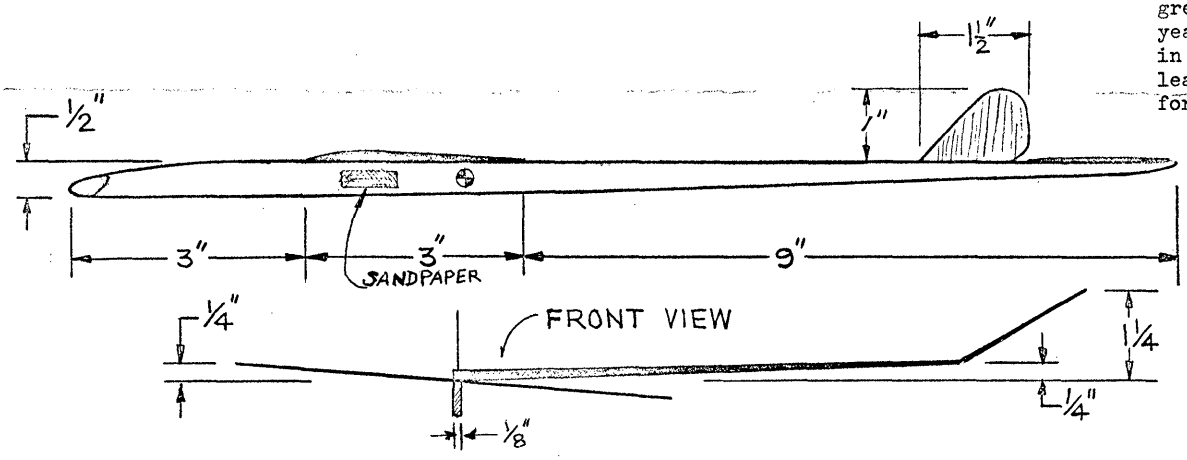
DESIGNED BY: NAT ANTONIOLI





LOW CEILING HLG

By Tom Vallee



From among the Rafters

Did you know....that our Research and Theory Society (be-(better known as the RATS) have come up with several exciting items it is felt should be presented to the modeling public?

- - -

For instance, did you know..... that the theory behind the hovercraft and of vertical ducted fan flight is not so new?....that its basic principles were firmly laid down by J. Robertson Porter in his book published in London in 1911?....and that a model design of such an aircraft was developed in the USA in 1939?

- - -

And....did you know....that Jerome Kittel established a World's Record in the late 1920's for Indoor Biplane ROG's of 1 minute 11.5 seconds?

- - -

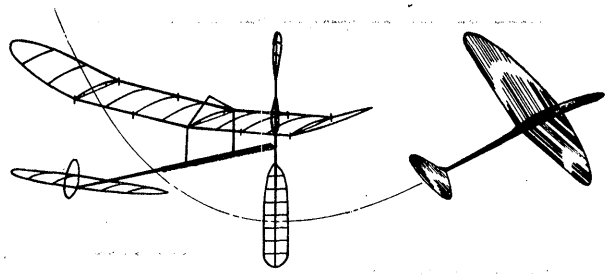
And....did you know that..... while the greatest developement in Indoor aeromodeling in the 30 years from 1907 to 1937 was in the model, developing from heavy, fast twin pushers that skimmed the floors of the armories for speed to superlight, film covered floaters that nudged the rafters for time,..... the greatest developement in the 30 years from 1937 to 1967 has been in the modeler, developing from lean youngsters avidly prepari for their place in aviation tc .....to.....shall we say... ..comparatively older men... ..treading softly....gazing upwards....with that same awe and.....well, you know?

- - -

And...did you know...there will be more of this fine researched data....if we are not censored?

The Voice of N.I.M.A.S. APR-1967

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

ROIE R. BLACK, 415 Hampton Court, Falls Church, Va. 22046
L. E. SHAW, 7416 South Elati St., Littleton, Colo. 80120
PETER YOUNG, 362 Memorial Dr., Cambridge, Mass. 02139

Nats Entry Blank

You will not receive a Nats entry blank this year if you don't ask for it! In a move to avoid printing many entry blanks to be mailed to the four winds, entry blanks are available only by request this year. So, send your request promptly, and include a stamped, return addressed envelope along. The return envelope isn't necessary, but you will save HQ time and money if you send it, and get your entry blank faster also.

Indoor Scale At Nats

Indoor scale will be held as an unofficial event at the 1967 Nats, sponsored by the North American Aviation Flightmasters. The scale judging will be done at the contestant hangar at Los Alamitos N.A.S., and the models will be flown July 27, 1967 at the Long Beach City College Boy's Gymnasium (45' ceiling). Send for details and entry blanks to Hal Osborne, 1932 Conejo Lane, Fullerton, Cal. 92633.

NIMAS Awards

Silver Cat. I HLG - 0:26.2, Bob Clemens

NIMAS Aces

Since January 1, 1965, when NIMAS Awards were first set up, only two fliers have won all three Awards in one event category to become NIMAS Aces. Now, Hewitt Phillips has joined Bud Romak (Cat. III Rubber Ace) and Bob Randolph (Cat. I Rubber Ace + Cat. II Gold Rubber) with his recent flights of 10:08, 13:26 and 16:59 in Cat. I. He has also applied for Cat. III Silver on the basis of his 30:36 flight made at Lakehurst during the 1965 Team Selection program.

Dick Black Memorial

A considerable amount of money has already been donated to create a lasting memorial to Dick Black. Anyone wishing to add to this fund please send your donation to Box 545, Richardson, Texas. Make checks to Ralph Tenny, and mark the check Dick Black Memorial. The problem of what form the award will take is under consideration, but has been complicated by the fact that Dick was one of the advisors who usually helped decide such matters.

National Free Flight Society

Have you joined NFFS this year or renewed your membership? If not, you're missing out on an excellent FF newsletter edited capably by Dave Linstrum, a full size plans service, a chance to join a unified voice speaking in the interest of FF, and numerous other services now being developed. Send $3.50 (AMA members) or $4.50 (non-AMA members) to Hardy Brodersen, 4729 Walnut Lake Rd., Birmingham, Mich. 48010.

1st International Paper Airplane Contest

SCIENTIFIC AMERICAN'S paper airplane contest became quite an event, and received tremendous publicity. The duration and distance winners were: Nonprofessional Duration - Jerry Brinkman, assistant sales manager for Globe Industries in Dayton, Ohio. Professional Duration - Frederick J. Hooven, special consultant to the general manager of Ford Motor Co. Nonprofessional Distance - Robert B. Meuser, mechanical engineer for Lawrence Radiation Laboratories. Professional Duration - Louis W. Schultz, engineering group manager for Stewart Warner Corp. The publicity resulting from this event may or may not help indoor and modeling in general, but many model builders entered and we all had fun.

POSTAL CONTESTS!

NIMAS Easy B Postal Meet

One Junior, one Senior and nine Open fliers entered the 2nd Annual NIMAS Easy B Postal meet. Times are all corrected via standard fudge factor to the highest ceiling height, and placings determined from corrected time. NIMAS Certificates will be sent to winners through third place as soon as they are prepared.

Entrant	Ceiling	Time	Fudge	Score	Place
Bob Gainer	20.5'	3.17.0	2.09	6:51.0	1st Jr.
Randy Richmond	90.0'	9:45.0	0	9:45.0	1st Sr.
Al Rohrbaugh	44.5'	10:39.6	1.42	15:07.8	1st Op.
Bob Clemens	23.0'	7:33.1	1.97	14:52.8	2nd Op.
Jim Richmond	90.0'	14:43.2	0	14:43.2	3rd Op.
Wayne Zink	44.5'	10:06.8	1.42	14:23.4	
Hal Crane	20.5'	6:37.0	2.09	13:49.0	
Bud Tenny	17.0'	5:50.5	2.3	13:25.2	
Clarence Mather	30.0'	7:35.0	1.86	13:07.2	
Bob Champine	20.5'	5:59.0	2.09	12:30.0	
Fudo Takagi	30.0'	6:57.0	1.86	12:01.8	

FAI INDOOR REPORT

Support FAI

Many benefits can come to indoor fliers who support the FAI Team Selection Program, and indoor modeling and the U. S. Indoor Team also benefit. The individual flier gains valuable experience in flying (even with an Easy B) and can learn much about flight strategy by flying with the more experienced fliers. Finally, the casual entrant in FAI has the satisfaction of making a small contribution toward stateside travel expenses (via his entry fee) of the team. The serious FAI fliers benefit from casual entrants, since the casual fliers increase the entry list to prevent the serious fliers from being eliminated early in the game. For example - Cummings, Atwood, Bilgri and Romak enter a Local Qual. Trials. If no one else enters, one of them must be eliminated, even if their times fall within seconds of each other. One casual entrant would have saved the day!

So, even though it is quite late (all Local Qual. Trials must be over by April 30, 1967) you still have time to enter. Remember, send $2 to AMA HQ to get entry form, and enter any local indoor meet with a model of 65 cm span or less. Of course, you have to get 75% of the winning time! It isn't even too late to organize a Local Qual. Trial, but you would have to hurry!

FAI World Record Listing

Page 43 of the May '67 American Modeler lists all current FAI World Records, among them Jiri Kalina's 26:40 flight in Cat. II and Rieke's 45:40 flight in Cat. IV. This listing will be questioned by AMA, since the ceiling categories were established after (4 years after, in the case of Rieke's flight) the flights were made. Another basis for concern is that 90 cm models were used to make both flights, and it will be quite difficult to exceed these times with 65 cm models.

Team Selection Trials Schedule

This listing shows Trials dates for a given area and gives a contact man. Obtain details from him.

CALIFORNIA - San Francisco (Cow Palace) - April 16, April 30. Bud Romak, 85 Sullivan Dr., Moraga, Cal. 94556
CALIFORNIA - Los Angeles/San Diego - Clarence Mather, 3880 Ecochee Ave., San Diego, Cal. 92117
ILLINOIS - Chicago - April 16, 1967* - Pete Sotich, 3851 West 62nd Place, Chicago, Ill. 60629 (ph. RE 5-1353)
MICHIGAN - Detroit - April 23, May 21. Pat Green, 16880 Woodbine, Detroit, Mich. 48219.
MISSOURI - St. Louis - Dick Ganslen, 917 Blackberry, St. Charles, Mo.
NEW JERSEY - Lakehurst - April 30. C. V. Russo, 143 Willow Way, Clark, N. J. 07066. May 21 - Ernie Kopecky, 38 Fawn Lane, Watchung, N. J. 07060
OHIO - Akron - April 30.** Bob Randolph, 5785 Forest Ridge Dr., N. Olmsted, Ohio
OKLAHOMA - Tulsa - April 15 (changed from April 22), May 13. Bob Hanford, 3838 South 88th E. Ave., Tulsa, Okla. 74145.
TEXAS - Ft. Worth/Dallas - Bud Tenny, Box 545, Richardson, Texas 75080.
VIRGINIA - Hampton - April 30. Don Orr, 320-D 73rd St., Newport News, Va. 23607.
WASHINGTON, D.C. - Tom Vallee, 444 Henryton So., Laurel, Md. 20810

*Date will be April 23, 1967 if Armory is not available on April 16.
**Contestants must contact Bob Randolph in advance for special security arrangements

Qualification Trial Results

BRAINBUSTER'S 2nd LOCAL FAI TEAM QUAL., March 18, 1967
Pat Gainer 6:09 + 6:44 = 12:53
Joe Boyle 5:40 + 5:42 = 11:22
Bob Gainer 3:04 + 2:18 = 5:22

M. I. T. FAI INDOOR QUARTER FINAL TRIALS, March 25, 1967
Harry Lerman 12:58 + 17:46 = 30:44
Ray Harlan 12:29 + 12:17 = 24:46
Ed Archer 10:42 + 12:29 = 23:11
Jim Daley 9:38 + 10:56 = 20:34
Herb Franck 8:59 + 9:19 = 18:18

AKRON FAI INDOOR LOCAL QUAL. TRIALS, March 19, 1967
Ron Ganser 16:19 + 17:01 = 33:20
Bill Hulbert 16:42 + 16:32 = 33:14
Joe Hindes 13:34 + 13:43 = 27:17
Linda Randolph 10:12 + 11:40 = 22:52
Lou Willis 7:21 + 8:15 = 15:36
Ron Ganser, Jr. 4:55 + 7:23 = 12:18

SAN DIEGO FAI INDOOR LOCAL QUAL. TRIALS, March 31, 1967
Lew Gitlow 9:26 + 11:29 = 20:55
Clarence Mather 9:05 + 11:00 = 20:05
Fudo Takagi 5:53 + 6:57 = 12:50

SAN FRANCISCO FAI INDOOR LOCAL QUAL. TRIALS, April 2, 1967
Larry Parsons 25:06 + 27:54 = 53:00
Bud Romak 25:36 + 26:30 = 52:06
Warren Williams 24:16 + 26:07 = 50:23
Carl Rambo 22:44 + 24:57 = 47:41
Robert Meuser 18:01 + 17:29 = 35:30
Manuel Andrade 15:30 + 18:10 = 33:40

LOW CEILING FORUM

Last month's question about factors which promote recovery from wall contact yielded two prompt answers. Ernie Kopecky compared his A ROG with Hewitt Phillips' FAI, since both models were mentioned in the article:

Model	Kopecky ROG	Phillips FAI
CG Location	Past 80%	96%
Prop dia./wing span	61%	62%
Prop pitch/diameter	2.5:1	2.62:1

Ernie's conclusions: Model hits the wall; because of extreme CG and extra high pitch, the model will back off the wall farther than normal model. High pitch delays recovery due to an inability to overcome inertia, thus enhancing recovery.

Hewitt says this of models able to survive wall touching: A conventional left turn with propeller torque is mandatory. As the model hits and momentarily slows down, torque rolls the model left and tends to head it away. The high prop torque (big motor and high pitch) helps too.

Another factor which helps is the long tail length. This enables the model to resist turning toward the wall as the wing tip hits, but primarily the model is able to have the wing far forward of the CG. This imparts a turning moment away from the wall at the moment of contact. I think my model will turn away from the wall when it hits at an angle less than about 20°. At greater angles it will be "captured".

STATE OF THE ART

Al Rohrbaugh's Cabin, which won the Stout Trophy at the '66 Nats, is in the spotlight this month. Al says, "Certain of the outline dimensions follow Bilgri's 'C' cabin, but the fuselage, tail boom and plugs are over 13 years old. The model had just one test flight to determine proper rubber size and one official flight which was sufficient. The turns were 1650, but as in many flight the figure does not mean much because of a midair collision which caused my model to lose a substantial amount of altitude. Although very light, the model is sufficiently strong to withstand normal handling and it will fly with the adjustments listed with no bad tendencies. At the risk of being repetitious, it should be emphasized that lightness should not be achieved at the expense of misalignments and warps due to flight loads." In all fairness to Al's excellent plan, I had neither the time nor the ability to trace the many construction details he included. So, anyone who wishes more details, please ask and I will furnish a photocopy of the complete plan.

Last month's FAI Survey summary was quite popular, and the info presented below was received after last month's deadline. The same abbreviations and conventions apply:

	Champine (note 1)	M. Koller (Austria)	Triolo (note 2)	Hulbert (note 3)	Romak (note 4)
W. Area	100/p	98/f	116/p	99.7/p	125/f
S. Area	49	40	64	34.8	44
CG Loc.			85/5	75/r	65/r
Model Wt.	.035	.030	.030	.027	.022
Rubber					
Prop P/D	15/25		17/30	16/24,28	16/32
Dihedral	Poly	Ellip.	Tip	Ellip.	Poly
"A"	5	4.9	5 3/4	5	5 1/2
"B"	14 1/8		13 7/8	14	13 1/4
"C"	12 3/16		12 7/8	12	12 1/4
"D"	13	10.6	14	12 3/4	12
"E"	12	10.6	13	12 1/2	9
"F"	4 1/4	3.54	4 1/4	3.7	5
"G"	15	14.6	18 1/8	12	11

Note 1 - 15 x 25 prop too low pitch, going to 16 x 32.
Note 2 - 1/16" washin, 1/16" washout.
Note 3 - Preliminary tests indicate considerable washin will be needed.
Note 4 - Best performance 12:52 in 22'; 25+ in 65'

SPREAD THE WORD

Some people hesitate to tell their story of flying indoor models because they feel they would be "tooting their own horn" too much. So, toot it! People and their hobbies are popular fare for newspapers and company newsletters. This is legitimate publicity for Indoor, and publicity for you is just a bonus. Two fliers who have recently "spread the word" are Al Rohrbaugh and Ed Hicks.

Al got a picture of himself and model in the home town newspaper - usually a good place to try first - and the article which went with it was quite detailed and very correct in presentation and details. Ed's story was presented in the UNION ELECTRIC NEWS, the newsletter published by Ed's employer. Again, the story was factual and was accompanied by an excellent picture. So, tell your story - and publicize Indoor at the same time! Another example - we have always found that the Richardson Daily News is eager to have hobby stories, so Kristi's recent record was a good opportunity. A typed review of the pertinent information and background gave them enough to base the story on, and they took their own picture of her.

RECORDS? MAYBE!

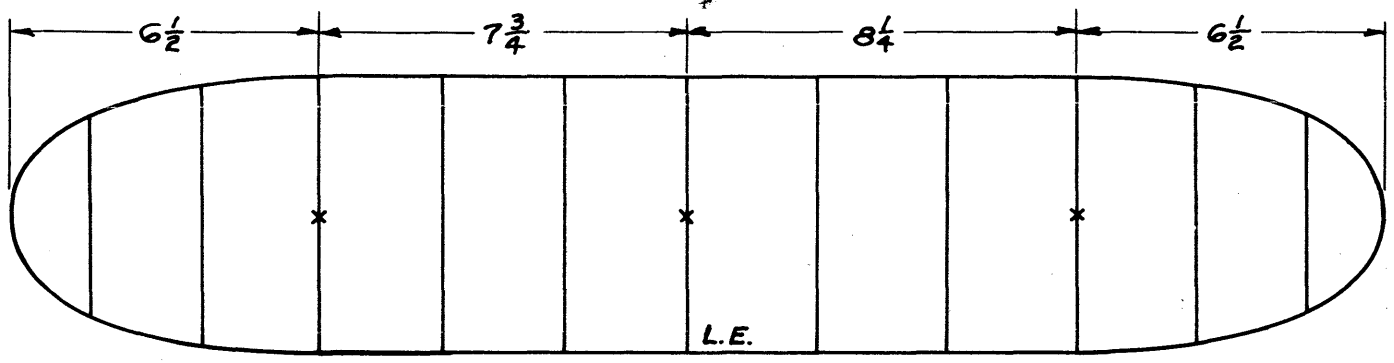
CAT. I RECORD TRIALS, Ann Arbor, Mich. Mar. 19, 1967
Sr. Autogyro - 2:45, Ned Smith

AKRON FAI TEAM QUAL. TRIALS, Mar. 19, 1967 90' ceiling
Wingfoot Lake Hangar, Akron, Ohio CAT. II
Jr. FAI - 11:40, Linda Randolph
Open FAI - 17:01*, Ron Ganser

M.I.T. FAI TEAM QUAL. TRIAL, Mar. 25, 1967, 42' ceiling
Open FAI - 17:46*, Harry Lerman

SAN FRANCISCO FAI TEAM QUAL. TRIAL, Apr. 2, 1967
Cow Palace, San Francisco - 99'1"ceiling
AMA Cat. II, FAI Cat. III
AMA Cat. II FAI - 27:54**, Larry Parsons
FAI Cat. III FAI - 27:54**, Larry Parsons

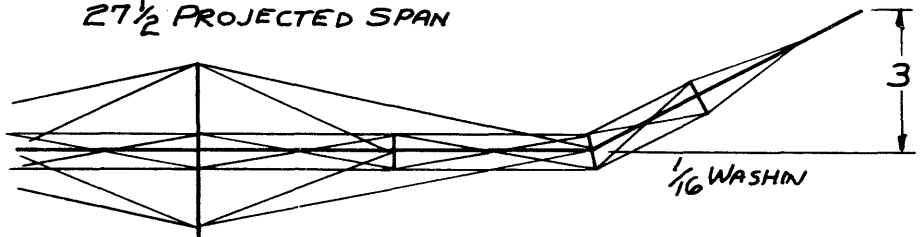
*Ron Ganser's record preceded Harry Lerman's record by one week, and both were eligible for FAI Cat. II FAI record. No info available if either applied.
**Larry Parson's record eligible for AMA Cat. II FAI and FAI Cat. III FAI records, but no info available to show he applied for either.

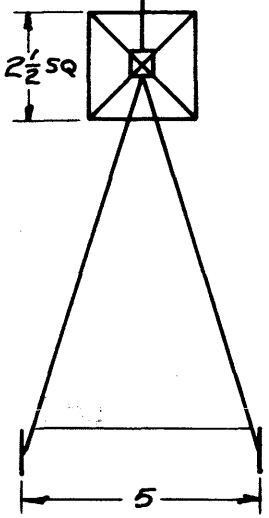


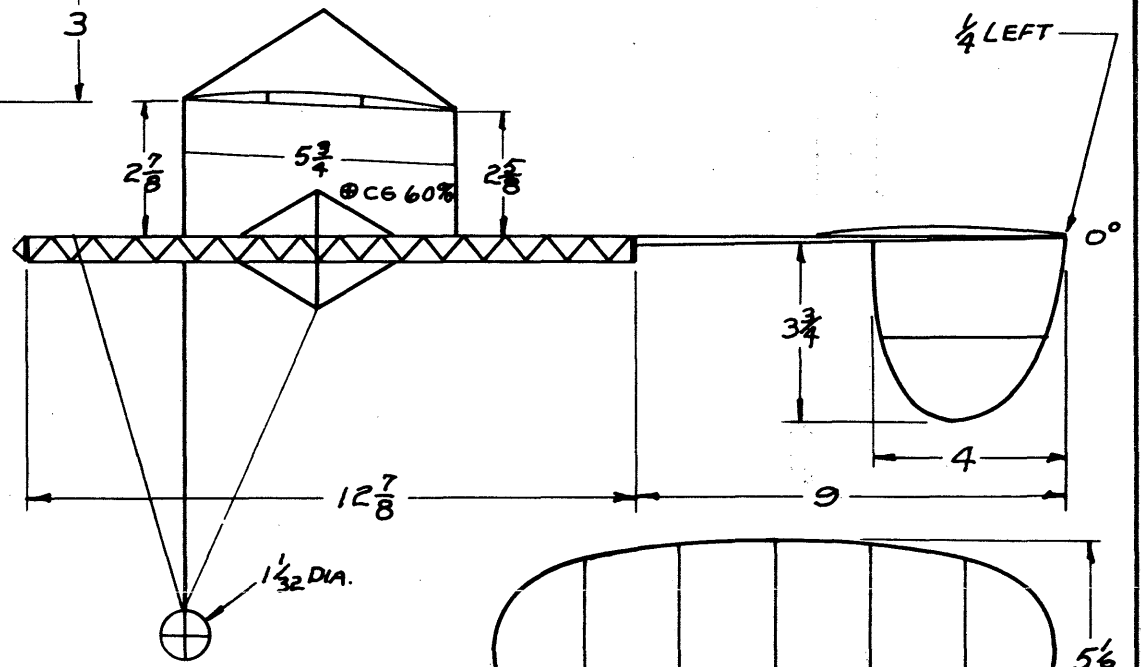
ALL BRACING
.001 TUNGSTEN

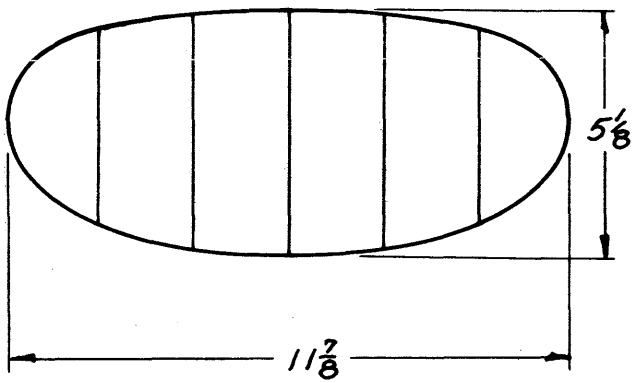
X DENOTES
COMPRESSION RIBS

27 1/2 PROJECTED SPAN









5/16 STAB TILT

PROP
16 1/2 DIA. X 25 P.
SINGLE SPAR
1 15/16 MAX. WIDTH
.020 SQ. OUTLINE
.065 DIA. > .030 DIA. SPAR
.012 X .015 RIBS
19 1/2 LOOP OF .053 PIRELLI

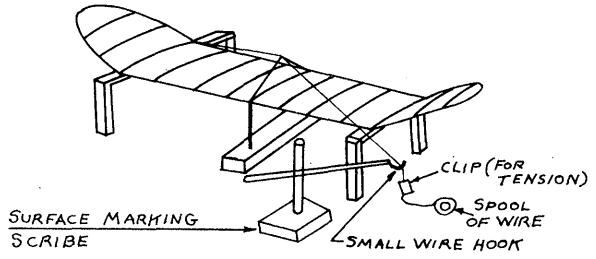
WGTS
FUSE - .0120
WING - .0085
PROP ASSY - .0055
TAIL ASSY - .0070
TOTAL - .033

1966 STOUT TROPHY WINNER
A. ROHRBAUGH
17:51+

HINTS AND KINKS

Bracing Hint

Bob Hanford suggests that a patternmaker's surface marking scribe is a useful tool to help brace wings. The wire is anchored to the wing and strung across to a small wire hook mounted on the scribe. Your favorite tensioning weight (such as a miniature plastic clamp) is hooked on the wire to tension it, and the end of the scribe is moved until the wire just touches the wing at the desired point. The wire is glued at that point and the process repeated until the bracing is finished. I expect to try a similar trick using dacron, except that I will use the scribe to substitute for the bracing points while stringing the dacron around the wing. Now, any rough place on my hands will catch the dacron and jerk on the wing; so the scribe would prevent damage to the wing when I snag the thread.



Glider Patch

Bob Clemens crunched in the leading edge of a glider during one session, and couldn't find any glue. He did have a paper label of the peel-off-and-stick-without-water type. It folded neatly over the wing and created a smooth "instant repair".

Need Round Strips?

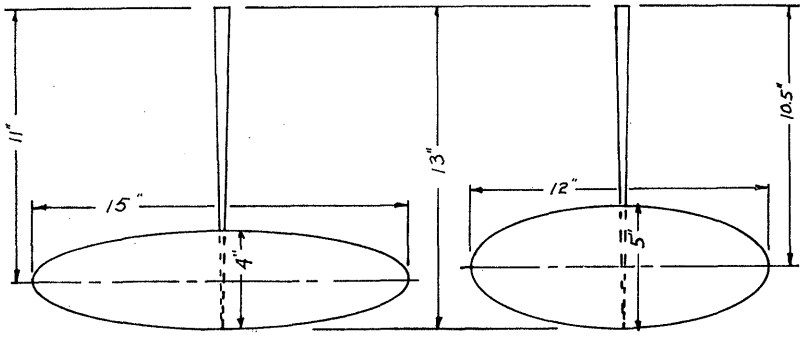
Ted Pfeiffer creates round strips from balsa and bamboo by pushing the square strips through successively smaller holes in a drill gauge. Almost any usable size of round strip can be produced in this manner by using drill gauges from number size drills.

QUESTIONS AND ANSWERS

39. To what degree can changes in wing aspect ratio help or hinder our model designs? That is, for indoor model speeds and sizes, where does model efficiency fall off due to small chord, rather than increase due to higher aspect ratio? How much change in efficiency results in changing aspect ratio both higher and lower than optimum?

40. What is the advantage of using a high aspect ratio stabilizer?

Although part of the answer may depend upon the answer to #39, here is one advantage: For a given stab area and boom length, the Tail Volume Coefficient (see #38, March '67 INAV) will be higher if the stab has high A/R. In the case sketched below, half an inch is gained in 65 cm size model by a change from A/R 3.9:1 to 4.9:1. Conversely, the tail boom could have been 1/2" shorter with negligible change in TVC by using the "skinny" stab.



A LOOK AT YESTERYEAR

On page five you find a tracing of a 1935 A ROG by Dick Ganslen, which needs very little to be completely modern. With wing bracing and a built-up prop, who could tell?

Boyd Felstead, an indoor old-timer from Australia, noted that Joe Matulis recently joined NIMAS. Boyd remembers Joe as a Chicago Aeronut of years gone by and asks, Can't you coax back Milt Huguelet? What happened to John Stokes, a leading indoor flier of the '30's?

NEWS FROM AROUND THE WORLD

CZECHOSLOVAKIA

Dagmar and Eduard Chlubna report that their first 65 cm model did 25:20 in test flights, presumably in the 44 m hall in Brno. The Czechs planned a meet in March or April in that hall, but no further details are available.

INDIANA - KOKOMO

Chuck Borneman reports that a session planned for the Bunker Hill gym has been cancelled and that no more sessions are planned until fall. The March session had a challenge match between the Kokomo crew and a team from St. Louis. Kokomo won, 46:30.9 vs. 41:40.4 for St. Louis in the Easy B event and Kokomo - 1:22.5 vs. 1:09. 0 for St. Louis in HLG. Individual winners: Easy B - 13:33.9, Jim Richmond; HLG - 0:44.4 (single flight), Bob Larsh. A paper airplane contest with Scientific American rules was won by Bob Hotze of St. Louis with 0:13.1. Bob consistently reached the 40' height with his glider - good flying!

MARYLAND - BALTIMORE

The annual meet by the Baltimore Aero-Craftsmen is scheduled for April 23 at the 5th Regiment Armory. Events are B Stick and B Paper combined, HLG, Easy B and Scale. Get entry blank and special rules from Bob Sifleet, 4412 Belvieu Ave., Baltimore, Md. 21215.

OKLAHOMA - TULSA

Bob Hanford's work is paying off - with a readily available site, the Glue Dobbers are really active indoor fliers. To further encourage the inexperienced, Bob set up Novice and Expert classes in HLG, and people come from Oklahoma City and Wichita to fly. The Mar. 18 contest was a big success with the following winners: Open Novice HLG - 0:45, Joe Stewart; Jr. Nov. HLG - 0:49.4, David Polemus; Open Expert HLG - 1:15.7, Bob Hanford; Jr. Expert HLG - 1:05.0, Geoffrey English; Open Rubber - 7:40.5, Mark Valerius; Jr. Rubber - 6:20.4, Geoffrey English.

PENNSYLVANIA - PITTSBURGH

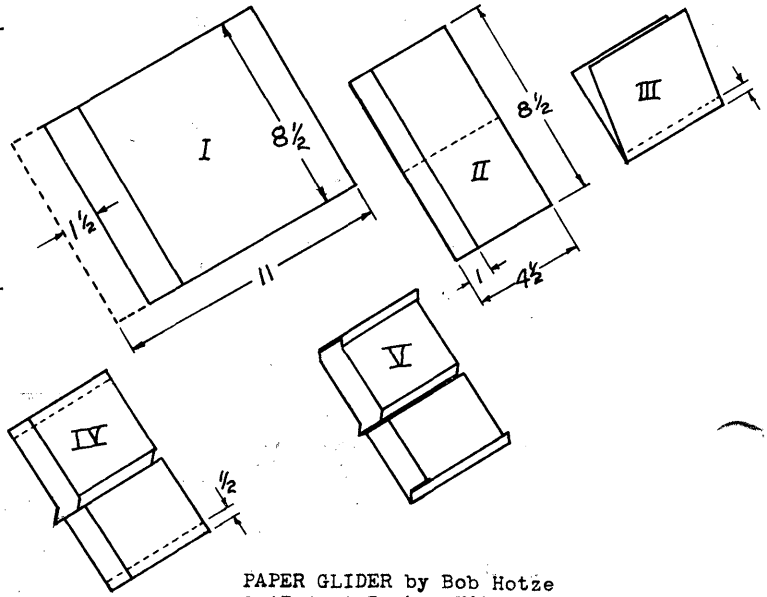
The world's second largest indoor air meet will be the 3rd Annual Indoor Air Meet, scheduled for April 16, 1967 at the Univ. of Pittsburgh Fieldhouse. This meet is patterned after the Great Lakes meet and has five age groups. Six model types plus Originality & Performance will be flown by the five age groups to make 28 events with trophies, merchandise and gift certificates being awarded to the winners. Plan to attend - it should be swinging affair!

WASHINGTON, D.C.

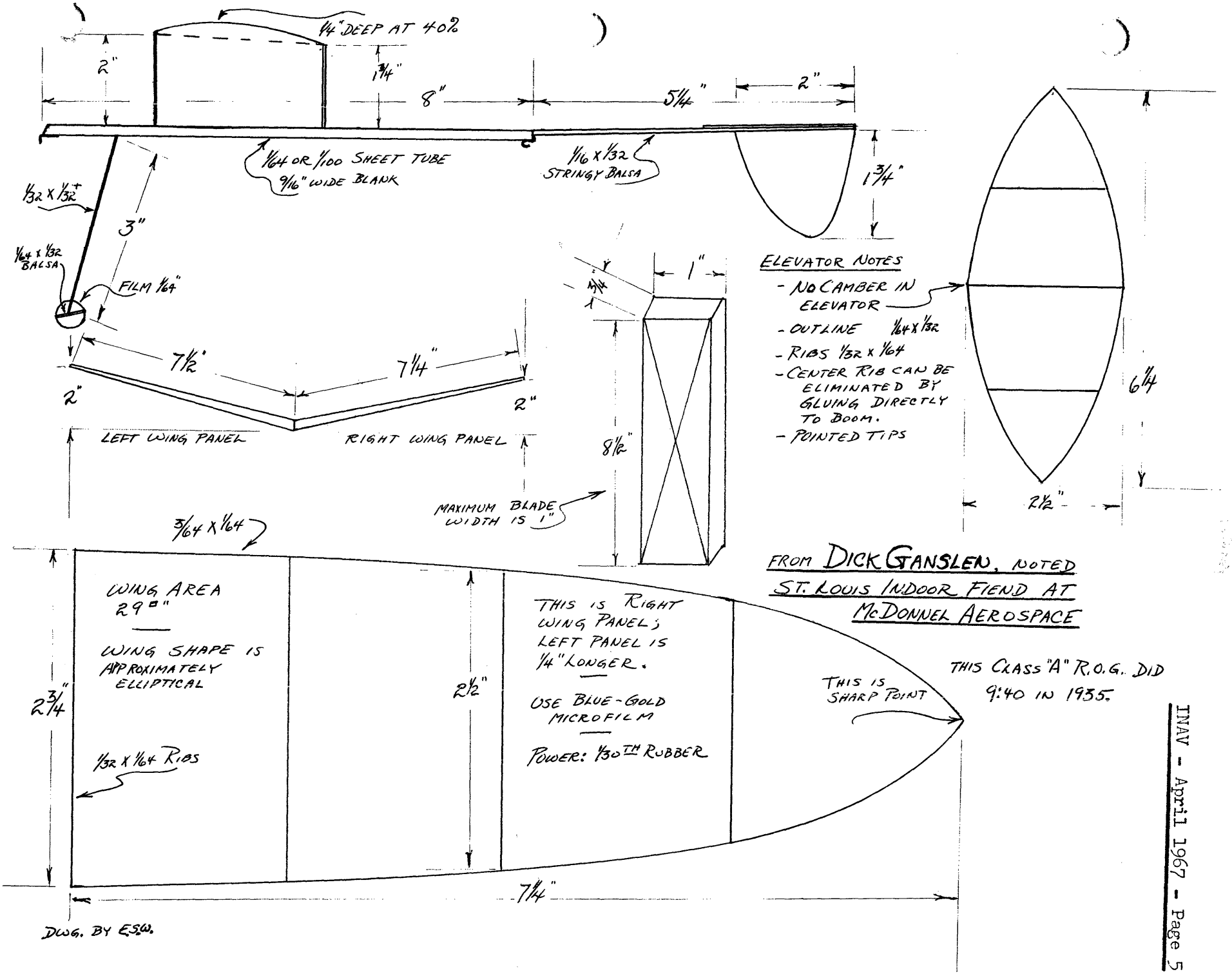
The next two Maxecutor sessions at Kennedy High School are planned for April 21 and May 12. The March 12 contest at Ft. Meade Fieldhouse had the following winners: HLG - 1:06.0, Dan Belieff; Easy B - 7:47, Reggie Batterson; B Stick - 11:08, Tom Vallee; Scale - 66 points (flying and scale) - Bernie Schulman.

YUGOSLAVIA

Vilim Kmoch reports that they had competition for 15 cm (5.9"!) models in February, with top time of about 7 minutes in a 16 m hall and 4½ minutes in a 3.5 m hall. The record (yes, 15 cm is a competition class) is 8:20 in a 34 m hall. A national competition for 15 cm, 35 cm and 65 cm is planned for April.



PAPER GLIDER by Bob Hotze
0:13.1 at Bunker Hill AFB

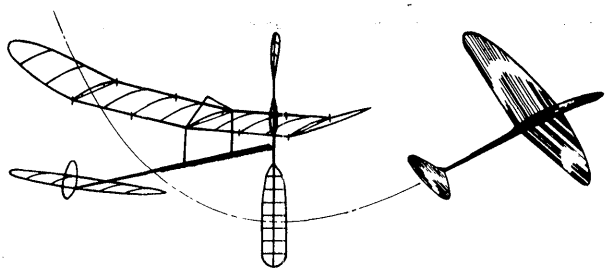


FROM DICK GANSLEN, NOTED ST. LOUIS INDOOR FIEND AT McDONNEL AEROSPACE

THIS CLASS "A" R.O.G. DID 9:40 IN 1935.

The Voice of N.I.M.A.S. MAY·1967

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

EDDIE CAPOGRECO, 1423 Andrews Dr., Cahokia, Ill. 62206
LESLIE HAMANN, Star Route, Levering, Mich. 49755
DONALD ROBERTS, 23245 Myrtle, Dearborn, Mich. 48128
ERWIN RODEMSKY, 29719 Stonecrest Rd.,
Palos Verdes Peninsula, Cal. 90274

AMA Rulebook

By now, all who renewed their AMA membership should have received their rulebook. It is extremely unfortunate that it was so late; do not lay it aside without a thorough study because of the tardy arrival. Very much that should have been in before is in it, and many very important new additions have been made. Well done, HQ!

Nats Reminder!

Remember that you will not automatically receive an entry blank for the Nats; you must request it. Send a stamped, self-addressed envelope to HQ with your request. The envelope isn't necessary, but it will result in faster service and save HQ more that the postage cost. Also, remember that Indoor Scale is sponsored as an extra-curricular event by the North American Flightmasters. Send for entry blank to: Hal Osborne, 1942 Conejo Lane, Fullerton, Cal. 92633.

NIMAS Awards

Silver Cat. I HLG - 0:27.0, Dave Linstrum
Diamond Cat. I HLG - 0:38.0, Larry Cailliau
Silver Cat. I Rubber - 10:26.6, Bob Clemens

INAV Index

A kind and industrious soul has volunteered to compile an index of INAV, and the work is progressing rapidly. In a short while, the index will be ready for typing. Will someone volunteer?

FAI INDOOR REPORT

FAI World Record Listing

The question raised last month about inclusion of Rieke's 1962 flight and Kalina's Oct. '66 flight as valid World Records (Cat. IV and Cat. II, respectively) was answered at the CIAM meeting thus: models for Indoor Records may have any wing span as long as the general area requirement is not violated. This means that indoor models (for record only, not competition) may have 2,325 sq. in. area if you like - but no more! Finally, Kalina's Cat. II record was set under Provisional Rules with the model size that was legal then - but model size does not count! So, it's no holds barred for World Records, which would seem to reduce the popularity of trying for World Records, since it soon will be necessary to have special models to even try!

Team Selection Finals Site

On March 6, 1967, it was learned that transportation to California for finalists would not be available. This necessitated a central location for the Finals; and a frantic search for a suitable site began. On May 8, the Pompeian Court of the Northwood Institute in West Baden, Indiana was chosen. The choice was not difficult after communication was established with the proper people - it simply was the only suitable site available! The dates are Aug. 3-4, 1967, chosen to permit competition at the Nats if desired. Progress of a renovation program at the Institute is expected to be sufficient to make housing and meals available to contestants and officials. The site itself is a circular, domed structure 208' in diameter and with 150' max. height. Construction of the roof trusses is similar to blimp hangars, so the usable ceiling is expected to be 135' to 140'. This site is very similar to many European sites, and should make a good training ground and competition site for our team.

Team Selection Trials Schedule

Quarter Final Trials

CALIFORNIA - San Francisco (Cow Palace) - May 13, 1967 Bud Romak, 85 Sullivan Dr., Moraga, Cal. 94556
CALIFORNIA - San Diego/Los Angeles - Clarence Mather, 3880 Ecochee Ave., San Diego, Cal. 92117
ILLINOIS - Chicago - May 14? or May 21? - Pete Sotich, 3851 W. 62nd Place, Chicago 60629 (ph. RE 5-1353)
MICHIGAN - Detroit - May 21, 1967 Pat Green, 16880 Woodbine, Detroit, Mich. 48219
NEW JERSEY - Lakehurst - May 21, 1967 Ernie Kopecky, 38 Fawn Lane, Watchung, N. J. 07060
OKLAHOMA - Tulsa - May 13, 1967 Bob Hanford, 3838 South 88th E. Ave, Tulsa, Okla. 74145
TEXAS - Dallas/Ft. Worth - May 13, 1967 Bud Tenny, Box 545, Richardson, Texas 75080 (ph. AD 5-4035)

Semi-Final Trials

EAST COAST - Lakehurst - June 11, 1967 C. V. Russo, 143 Willow Way, Clark, N. J. 07066
NORTH CENTRAL - Detroit, Mich. June 18, 1967 Pat Green, 16880 Woodbine, Detroit, Mich. 48219
SOUTH CENTRAL - Dallas, Texas - Bud Tenny, Box 545, Richardson, Texas 75080
WEST COAST - Cow Palace - Bud Romak, 85 Sullivan Dr., Moraga, Cal. 94556 (ph. 376-4624)
Late word - Semi-Final set for June 18, 1967

Qualification Trial Results

ST. LOUIS LOCAL FAI TEAM QUAL.			
Charlie Sotich	14:49	13:54	28:43
R. Hardcastle	11:27	12:39	24:06
Dick Ganslen	9:18	14:12	23:30
E. Capogreco	11:05	10:46	21:51
Dave Linstrum	7:54	7:47	15:41
Pat Tryon	7:06	7:33	14:39
2nd COW PALACE LOCAL QUALS. April 16, 1967			
Joe Bilgri	22:02	24:40	46:42
Erwin Rodemsky	20:01	20:26	40:27
Walter Ghio	7:55	8:53	16:38
Jerry Powell	8:22	7:53	16:15
TULSA LOCAL FAI TEAM QUAL. April 15, 1967			
Bob Hanford			13:31
John English			12:01
Bobby Hanford			9:50
CHICAGO LOCAL FAI TEAM QUALS. April 16, 1967			
Jim Richmond	19:37	27:32	47:09
Al Rohrbaugh	19:53	20:33	46:26
Wayne Zink	19:16	18:04	37:24
Bob DeBatty	16:26	16:46	33:12
Curtis Janke	14:23	15:01	29:24
Pat Laughton	13:20	12:00	25:20
HAMPTON 2nd LOCAL TEAM QUALS. - April 18, 1967			
Pat Gainer	6:09	6:44	12:53
Joe Boyle	5:39	5:42	11:21
Bob Gainer	3:04	2:18	5:22
DETROIT FAI LOCAL TEAM QUALS. April 23, 1967			
Ed Stoll	16:58	18:23	35:21
Pat Green	16:19	15:56	32:15
Ned Smith	14:27	14:35	29:02
Dale Wilson	14:12	9:46	23:58
Tim York	10:30	10:52	21:22
Joe Serviates	11:52	9:27	21:19
LAKEHURST FAI LOCAL TEAM QUALS. April 30, 1967			
John Triolo	21:31	24:13	45:44
Ernie Kopecky	20:33	23:09	43:42

Pete Andrews	22:49	20:39	43:28
C. V. Russo	20:47	21:20	42:07
Julius Rudy	18:27	20:37	39:04
Bill Bigge	16:38	20:23	37:01
D. Martin	18:09	18:09	36:18
Manny Radoff	14:35	12:02	26:37

AKRON 2nd LOCAL TEAM QUALS. April 30, 1967

Joe Hindes	16:59	18:02	35:01
Bob Randolph	17:21	16:05	33:26
Bill Hulbert	15:58	15:44	31:42
Ron Ganser	13:15	13:26	26:41

Qualifiers From Contests

BALTIMORE INDOOR CONTEST
B Stick - 9:38, Tom Vallee (12:10 winning time)
WICHITA, KANSAS INDOOR CONTEST
A ROG - 4:51.6, Stan Chilton (4:51.6 winning time)
STATE MEET, DETROIT, MICHIGAN
Indoor Stick - 19:20, John Chizmadia (21:58 won)

STATE OF THE ART

The model of the month, Hewitt Phillips' FAI, has been the center of much conjecture since the outstanding 16:59 flight in a 20.5' ceiling. Parameters of the model, as published in March '67 INAV, added fuel to the discussion. The model features several unusual design concepts, as can be seen from the plan. Hewitt describes the original version (the second version shown in plans) thus: Actually, the model is nothing to brag about. It is built from an old class B motor stick and is intended more for durability than record performance.

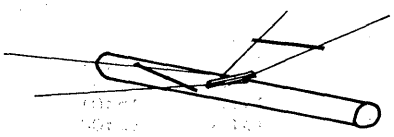
The gull wing and dihedral tail give the model an unusual appearance. The wing is built with high dihedral and pulled down by the braces on the lower surface. This feature leaves the top clear of brace wires and makes for easy patching and re-covering. The short wing struts help reduce drag somewhat.

The wing brace wires are attached to the motor stick rather than the struts. This system is possible because the wing is fairly heavy. The braces are attached as shown in the sketch below; that is, they are simply hooked under some 1/32" square balsa glued to the motor stick. Two other small strips are glued across the brace wires about 1/2" from the motor stick. By sliding the braces back and forth, the wing twist may be adjusted. Once it has been adjusted, another little stick glued across the chordwise strips will hold the position. (Ed. note - the above comments were in one letter; the next came about 2 weeks later).

I didn't realize at the time I wrote that the model had set a record. The plans I sent were for the model which set the record of 12:51 in a 19' 8" ceiling.

Since then I made a few modifications and made a flight of 16:59 in a 20.5' ceiling. The changes were as follows: The 13½" prop was replaced by a 16" prop. One bay was added to the inboard wing to increase the span to near the allowable 25.5"; this gave an extreme wing offset. The tail boom was twisted to tilt the stab to the right for a tighter left turn. The result was a very small diameter left turn without much loss in efficiency.

My present feelings on design are that aspect ratios should be increased, prop diameters should be larger and rubber-weight ratios should be increased (as compared to present FAI design). The present model may have gone a little too far in these directions, but I think the times show some promise in this trend. (Ed. note - the model has better than average ability to recover from collisions with obstructions - see discussion in April '67 INAV)



RECORDS? MAYBE!

The effectiveness of this column is highly dependent upon reports from CD's, not just a report of times, but also of who applied for what record. The fliers themselves can report that they applied for a record, but if neither one reports, who can know? The report really should come at time of application, but it is not too late after you receive the record. This is especially important since AMA's present method of publishing the current records is to send the list to AMA Charter Clubs and AMA officers. Unfortunately, many indoor fliers do not belong to a charter club, and they never get the word.

Two records which have been confirmed recently are:
Sr. Cat. I B Cabin - 9:19.6, Neil Shipley
Open FAI Cat. II FAI - 10:05, Bob Wilder

If present plans work out, the June issue of INAV will have a summary of indoor records, updated to the best of the available information. Speaking of available information, I goofed twice in this column last month. Firs I got all crossed up and announced a flight by Ned Smit as Sr. Cat. I Autogyro, and it really was Open Cat. II Ornithopter, and not a record at all! Second, the flight of Larry Parsons at the Cow Palace was announced as being eligible for FAI Cat. III. Actually, the Cow Palace, at 99' 1" ceiling, is AMA Cat. II and FAI Cat. IV! Finally, here's a prospective record:

BRAINBUSTER RECORD TRIALS, Hampton, Va. Apr. 30, 1967
Willis School Auditorium, 20.5' ceiling, Cat. I
*FAI Cat. I FAI - 14:41, Hal Crane

*To avoid confusion, the two record classes are named AMA Cat. I FAI and FAI Cat. I FAI, for the different ceiling heights.

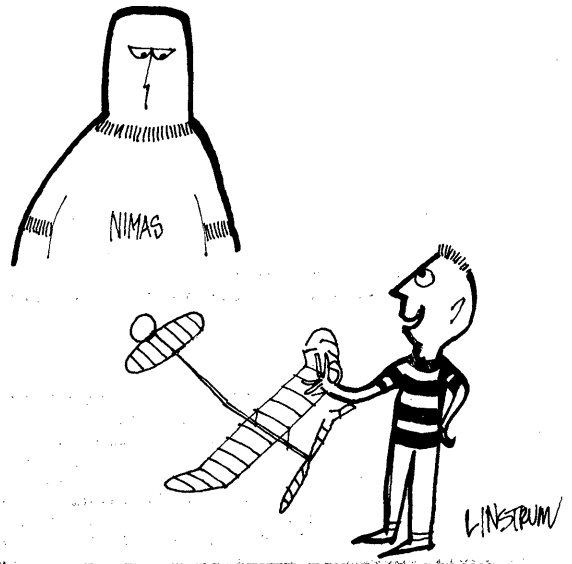
NEWS FROM AROUND THE WORLD

CZECHOSLOVAKIA
The first Czech national indoor contest for 1967 was held in the 45 m hall in Brno, with weather just above freezing. Times in 65 cm were (two flight totals): Eduard Chlubna - 40:45, Jiri Kalina - 38:22, Dagmar Chlubna - 33:51, Rudolf Cerny - 30:48, Josef Gabris - 27:01. 35 cm times were: Rudolf Cerny - 18:24, Josef Gabris 16:11. A second national meet is planned early in June, and Manfred Koller and others from other countries are expected to attend.

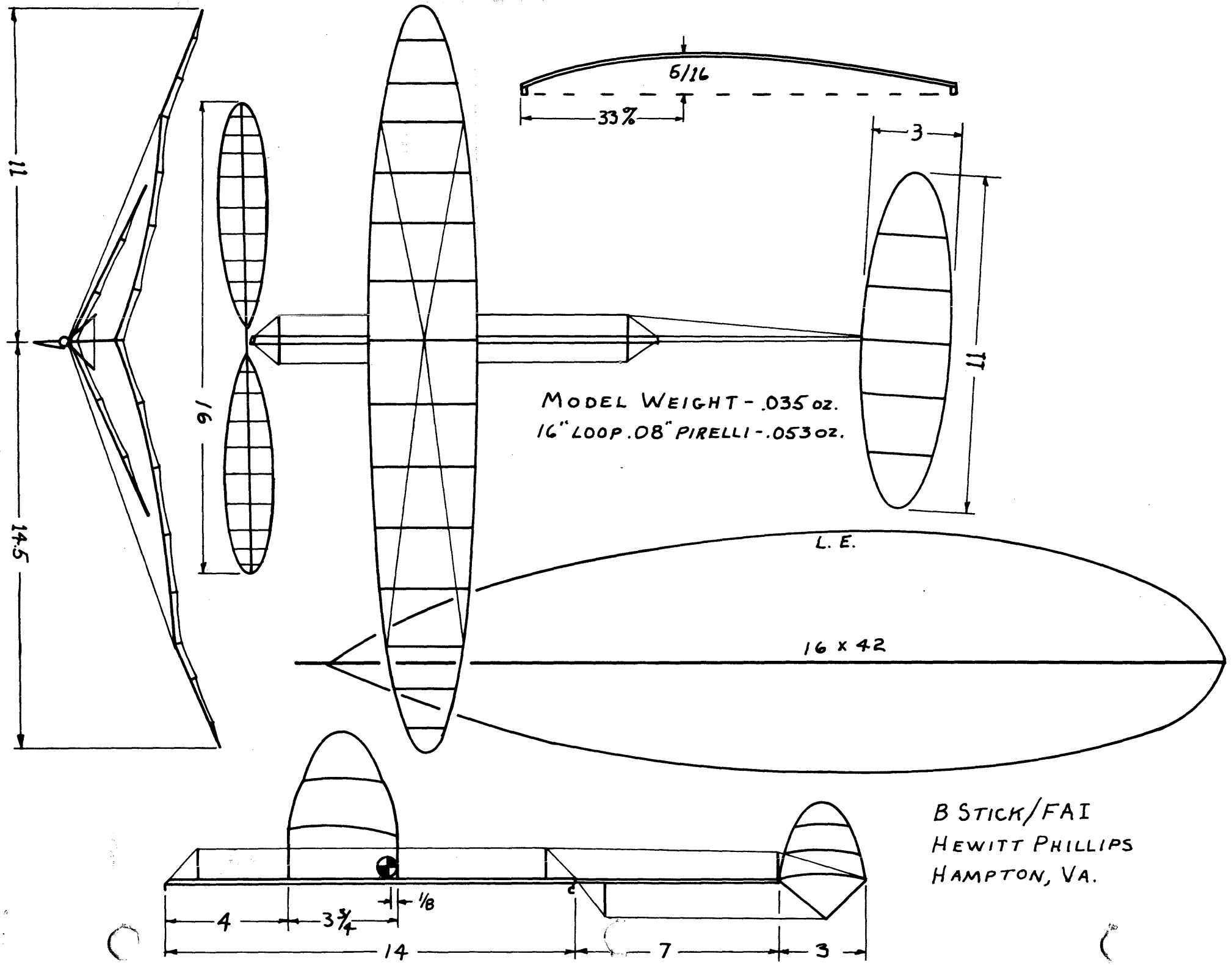
MISSOURI - ST. LOUIS
The April indoor contest in St. Louis closed out a highly successful indoor season (competition is over, but practice sessions can be held at the National Guard Armory on Wednesday nights). Winners: Jr. Easy B - 4:42.4, Pat Wood; Open Easy B - 8:09.0, Bob Hotze; Open Paper Stick - 12:48, Charlie Sotich; Jr. Paper Stick - 4:33, Pat Wood; Jr. HLG - 1:06.5, Dave Veselsky; Open HLG - 1:28.9, Larry Cailliau.

OKLAHOMA - TULSA
The Tulsa Glue Dobbers have thrived on indoor - so well that Bob Hanford plans a sanctioned contest in June. This is a triumph for Bob and others who have worked so hard to establish indoor there, and it is heartening to others in the south central U. S. also. If a few more groups can follow through with similar programs, indoor competition between cities could be a reality. For info on the meet, contact Bob Hanford, 3838 South 88th East Ave., Tulsa, Okla. 74145

NEW JERSEY - LAKEHURST
Scale models and FAI models were flown at the April 30 session at Lakehurst - at a brand new scene. Hangar #2 (far north of the big hangars) is a 100' site, very drift-free and well lighted. As a site for team selection, it could hardly be beat - it was an excellent choice. Even with the light, however, one model went OOS into the rafters and the owner couldn't catch sight of it later.



"GEE, MISTER, THIS STUFF ISN'T AS STRONG AS MOM'S SARAN WRAP!"


11
14.5
16
6/16
33%
3
11
MODEL WEIGHT - .035 oz.
16" LOOP .08" PIRELLI - .053 oz.
L. E.
16 x 42
1/8
4
3 3/4
14
7
3
B STICK/FAI
HEWITT PHILLIPS
HAMPTON, VA.

QUESTIONS AND ANSWERS

In response to Question #40 (April '67 INAV), about advantage of high aspect ratio stabs, Charlie Sotich has offered the following information from Dec. '47 Air Trails.

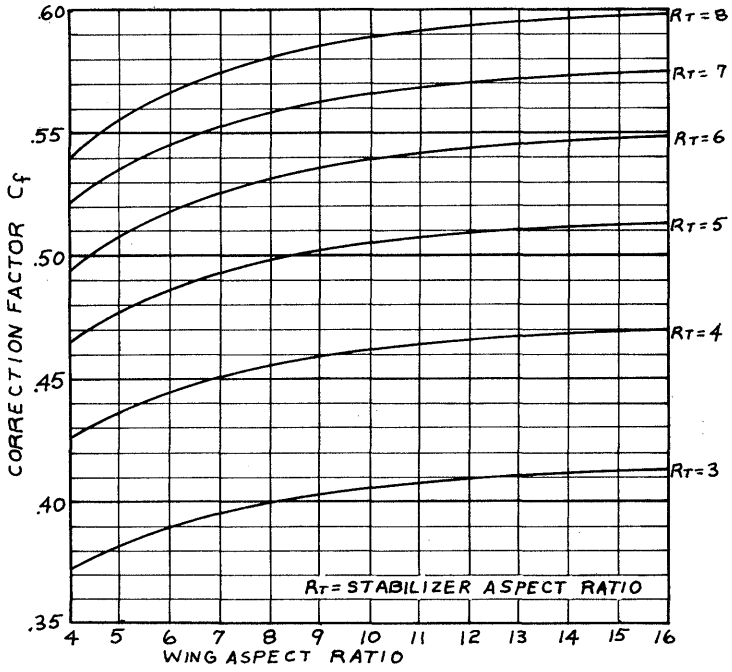
The aspect ratio of a lifting surface changes the rate of change of lift with change in angle of attack. For any model which makes a given change in angle of attack, a stab with high aspect ratio will increase in lift faster than a stab with low aspect ratio. The graph and example below illustrates the effect of this phenomenon on permissible location of CG (for equivalent longitudinal stability of the model).

To illustrate, we assume a model with rectangular surfaces; 100 sq. in. wing (6:1 A/R), 16" tail moment arm measured from 25% of mean chord on wing to 25% of mean chord on the tail; vary the aspect ratio of stab from 3:1 to 6:1. The wing dimensions will be 4.1" x 24.5"; one stab will be 3.65" x 10.9" and the other 2.58" x 15.5".

Refer to Step 4 of instructions below the graph, and to Fig. I which details the model with low A/R stab. To locate the A.C. (aerodynamic center) of the model, read C_f of .39 (3:1 A/R) from the graph and compute:

$$A.C. = \frac{\text{stab area}}{\text{wing area}} \times \text{tail moment} \times .39 = .4 \times 16 \times .39 = 2.5$$

This result shows that the A.C. should be 2.5" behind the 25% mean chord of the wing. Now, locate the C.G. 25% of one chord ahead of the A.C. (the 25% chord figure is an arbitrarily assigned value, and can be "juggled" slightly for more or less stability as your own design permits. A similar computation for the case with stab A/R of 6:1 yields 3.3" behind the wing quarter-chord point. Using 25% of wing chord as multiplier, C.G. in the first case will be 1.69" ahead of the wing T. E. In the second case, the location would be .83" ahead of wing T. E. To couple this information with that concept presented in the April '67 issue, the model using 6:1 A/R stab will have an 80% CG (vs. 59% for 3:1 A/R stab version) and the model can be .8" shorter from the wing quarter-chord to end of stab. In addition, it may work out that the 80% CG location may permit the wing to be far enough ahead to further shorten the tail boom and yield a lighter model.



METHOD FOR DETERMINING POSITION OF C.G.

STEP I Measure tail moment arm between 25% point on the average chord of wing and stab.
AV. CHORD = Area/Span

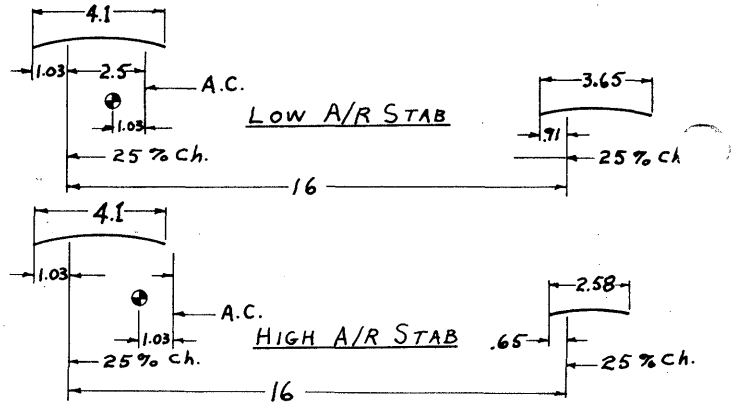
STEP II Find Aspect Ratio of Wing and Stab
Aspect Ratio = Span/Av. Chord or $Span^2/Area$

STEP III Find C_f from graph

STEP IV Find distance from 25% point of wing to A. C.

$$A.C. = \frac{\text{stab area}}{\text{wing area}} \times \text{Tail Mom. Arm} \times Cf$$

STEP V Locate C.G. 25% of average chord ahead of A.C.



A word of caution or reminder: this computation is based on using the mean chord of wing and stab, rather than the root chord. In the example, rectangular surfaces were assumed. In this case only will the mean chord and the root chord be the same.

THE TRAINING OF A CHAMPION

Not very many people know that Hans Beck, 1966 Indoor World Champion, was totally inexperienced with 90 cm. indoor models a few short weeks before the Championship at Debrecen, Hungary. He freely acknowledges that his training under Karl-Heinz Rieke (1962 World Champion) made the difference, but this in no way takes away from Beck's high degree in competence with free flight models in general.

As space permits, we will present copies of letters which passed between Hans and Karl-Heinz, shared with us by Hans and translated by Manfred Koller. This will trace the way Hans took from FAI Power flier to Indoor Champion.

Nurnberg 3/6/67

Dear Karlheinz!

I was idle in modeling for a long time now. The winter was not very eventful, in aeromodeling of course only. The last weeks were somewhat hectic because of the internat-nal toy exhibition. (Ed. note: Hans is a toy designer a big plastic firm in Nurnberg.) This is now over and have time to devote to indoor modeling. To my surprise I was selected to represent Germany, together with Strattner and Hacklinger, at the World Championships.

So I have a request: do you have any kind of indoor devices, material and wood you do not need any more? I especially think of the thin quarter-grain balsa sheets you gave me once. Also, bracing wire would be helpful. If you don't have anything of this kind any more, I would be very grateful if you could tell me where I can get this supply.

In May or June we will make a little meeting at Nurnberg and it would be nice if you would also come with one of your models.

Best regards,
Hans

Berlin 3/11/1966

Dear Hans!

Many thanks for your sign of life. I will answer in a hurry and please answer as fast as possible, because I am only in the coming week at Berlin to collect all the things you requested.

First I want to help you with supply. I can send you wire and the thin sheets. Balsa for the wings and stab I also do not have. You can buy it when you select in your local hobby shop carefully.

To my opinion are Hacklinger's and my model the optimal possibility and it would be nonsense if you would try in the very short time to build after your own design. I would say, you should build my models exactly as I did. Then the risk should be at a minimum. Have I written about the weights of the different parts of the model? You should stay for for the first models approximately 25% above my weights. Then you will have a model which surely flies 35-40 minutes (at Cardington).

Of course I will send you my model boxes, also the jigs and templates. If you have any detailed questions, it would be best if you would visit me at Berlin on one of the coming weekends.

The site at Debrecen is so high that one can fly wit an excellently trimmed model approximately 35 minutes. But, the ground area is relatively small. So it will be necessary to change the original design in view of the very small circles. It will be the best if you enlarge the original washin on the inner wing. I will tell you in my next letter how much and I will also send you pictures of the site at Debrecen. Now send as soon as possible your list about what you want.

Best regards,
Karlheinz

PITTSBURGH HOLDS MEET FOR JUNIORS

"3RD ALLEGHENY INDOOR MEET" HAS 3 JUNIOR AGE GROUPS

Junior fliers are often neglected; but in Pittsburgh they are treated as royalty. This is the third year the three modeling clubs in the area have banded together to, as Ron Ganser put it, "help the youngsters get a start in our great hobby". There were events for Seniors and Adults, too; but 156 Juniors competed and the 79 Dodoes and Fledglings alone put up 464 flights. .....Yes, indeed.....it was quite a show!!

The sponsors were the best and promoted the contest so that the whole area was model airplane conscious. The really big event was the KDKA-F-1020 Racer (identical to the AMA Delta Dart designed and promoted by the Pittsburgh sparkplugs). They had Radio Station KDKA buy 2000 of these from SIG with KDKA call letters printed on wing covering. The Station announced over the air that they would send to each written request a kit. In the first week all 2000 were gone under an avalanch of over 6000 (yes, six thousand) written requests and more requests kept coming in.

Besides Station KDKA, the sponsors were the Allegheny Airlines, Pittsburgh Inst. of Aeronautics, and Page Airways.

The Clubs promoting it were the Greater Pittsburgh ARCS (radio control), West Hills Aeromodeling Kontroline Society, and the Pittsburgh Aeromodelers (free flight); while the individuals behind it all are Ron Ganser, Ralph Pennetti, Jr., Richard Meyer and Don Hewston.

This year the meet was held at the University of Pittsburg's 52' ceiling Field House on April 16th. Prior to their first meet in 1965, the Pittsburgh area had seen no organized competition since 1948. The members of the Allegheny Model Airplane Council put on that first meet with the help of the Penn Hills YMCA; and from two events in four age groups it has jumped this year to rival the famed Cleveland bash under Chuck Tracey.

Key to their effort is in their dividing the AMA Junior Age category into 3 sections: the little Dodoes 9 years old and under, Fledglings 10 thru 12, and Juniors 13 thru 15. Prizes were given thru fourth place in all events, and, while some places were not filled in the older classes, we wish we could report the efforts of those Dodoes and Fledglings down to about 20th place in the KDKA F-1020 event. They really deserve it!

Originality & Performance - Contestants submitted original indoor models and were scored on their ability to describe and answer questions on design, flight forces and trim adjustments made to improve flight performance. The outstanding models were a pusher flying wing and a tractor flex wing. The Junior winners won Buhl Jr. Space Academy Scholarships, which are classes taught to youngsters at Buhl Planetarium on space science. Seniors each won 3 hours flight instruction. Judges were two pilots from the Pittsburgh Aero Club and Ron Ganser.

Entrants		Age Classes	KDKA F-1020	HLG	Pre-Fab	Paper or Easy B	Mike	Flying Scale	Orig. & Perf.
Juniors Age 15 & Less 156	54	Dodoes (9 & Less)	40	14	11	X	X	2	4
	63	Fledglings (10-12)	39	23	10	4	X	6	9
	39	Juniors (13-15)	X	15	12	5	3	6	1
	8	Seniors (16-20)	X	2	1	0	1	0	3
	25	Open (21 up)	X	13	8	7	4	9	X
Total 189			79	67	42	16	8	23	17

KDKA F-1020	Age	Time
Dodoes		
1) Mark Talley	6	1:01.4
2) David Masters	9	:57.5
3) Terri Knoblauch	6	:54.2
4) Greg McGruer	9	:54.0
Fledglings		
1) Nicky McGruer	11	1:09.0
2) Douglas Masters	11	1:05.0
3) Mark Kastory	10	1:04.0
4) Robert Postage	11	:55.6

H. L. GLIDERS	Age	Time
Dodoes		(2 flgts)
1) Paul Hare	9	34.0
2) David Kearns	8	27.0
3) Greg McGruer	9	26.2
4) Glen Watson	9	22.1
Fledglings		
1) David Ganser	11	55.0
2) Robert Postage	11	34.0
3) Nicky McGruer	11	32.8
4) Kevin Dadey	12	30.2
Juniors		
1) Ronald Ganser,Jr.	13	66.5
2)John Steward	14	39.2
3) Carl Godliski	14	27.7
4) Bob Hulick	14	20.0
Seniors		
1) Thomas Rogers	16	21.2
2) Pete Darr	?	9.0
Open		
1) Ron Ganser	40	60.0
2) Norman Bickar	32	59.1
3) Clyde Hare	39	52.2
4) Robert Masters	36	40.9

Pre-Fabs were made from all-balsa kits of cabin models similar to Top Flite Jig-Time series. Surfaces could be sanded, but enough print had to be left to prove no materials were substituted.

Flying Scale - Kits were allowed with points given for detail, scale & workmanship, while in Sr/Op Combined competition only AMA rules were follwed.

Timetable for all events was incredibly tight, with registration & microfilm starting at 10AM and done by 1PM, and other events taking turns to 5:30. Tucked into this somewhere the RC Club put on a rousing taxi demonstration on the gym floor. The Clubs also had displays of UC, R/C and Free Flight models at booths manned throughout the day to answer the many questions. Spectators totalled about 2000, with 1000 on hand at all times.

* * * * * *

Study the chart at left to see where the interest lies. The accent was really on the JUNIORS, and that is where it belongs.

QUITE A SHOW!!!... .....Use it as a guide to your next meet!!!

PRE-FAB	Age	Time
Dodoes		
1)David Masters	9	:54.9
2) Tim Hare	7	:27.0
3) Gordon Oresti	8	:19.6
4) William Hill	8	:16.1
Fledglings		
1) David Ganser	11	:55.5
2) Douglas Masters	11	:45.9
3) Robert Postage	11	:33.5
4) Steve Bayer	10	:30.9
Juniors		
1) Ronald Ganser,Jr.	13	1:11.3
2) Tom Kutcher	13	:36.7
3) Ralph Kaiser	13	:31.0
4) Wm. Messenger	15	:25.0
Senior		
1) Ed Gallagher	18	:15.8
Open		
1) Ron Ganser	40	1:26.4
2) Norman Bickar	32	1:10.1
3) Robert Masters	36	1:10.0
4) Ken Johnson	36	:56.6

EASY "B"	Age	Time
Fledglings		
1) David Ganser	11	3:51.1
2) Nicky McGruer	11	3:20.4
3) Douglas Masters	11	2:32.0
4) Ken Meyers	12	:24.0

PAPER COVERED STICK	Age	Time
Juniors		
1) Linda Randolph	14	10:35.2
2) Ron Ganser, Jr.	13	7:34.8
3) Tom Kutcher	13	2:27.4
4) Wm. Messenger	15	:29.0
Senior		
No Entries		
Open		
1) Gerald Skrjane	35	12:29.2
2) Bob Randolph	44	12:15.2
3) Ron Ganser	40	11:35.2
4) Norman Bickar	32	10:03:6

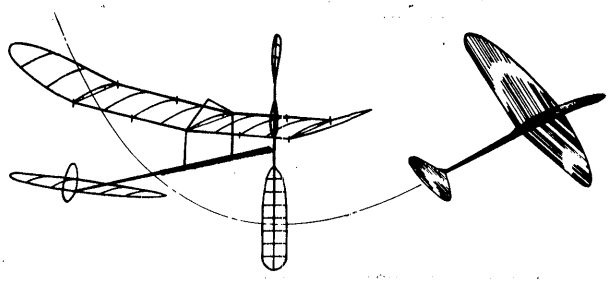
MICROFILM STICK	Age	Time
Juniors		
1) Linda Randolph	14	10:26.6
2) Ron Ganser,Jr.	13	7:43.8
3) Wm. Messenger	15	:06.0
Seniors		
1) Neil Shipley	20	7:41.7
Open		
1) Wm. Hulbert	44	13:50.0
2) Ron Ganser	40	10:02.0
3) Bob Randolph	44	9:31.0
4) Richard Meyer	39	3:45.5

FLYING SCALE	Age	
Dodoes/Fledglings/Juniors		
1) Ron Ganser,Jr.	13	Bleriot
2) (Not Reported)		
3) Terri Knoblauch	6	
4) David Masters	9	
Seniors/Open		Bristol
1) Ken Johnson	36	Prier
2) Betty Jane Kastory		Fairchild Heliporter PC6C
3) Ken Johnson (a re-entry)	36	Valkerie 1910 Pusher
4) Ron Ganser	40	Curtis Robin

ORIGINALITY & PERFORMANCE	Age
Dodoes/Fledglings/Juniors	
1) Robert Postage	11
2) Paul Hare	9
Seniors	
1) James Dorsey	17
2) Allen Stein	18

The Voice of N.I.M.A.S. JUN·1967

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

FRED M. HUBLITZ, 1408 Key Dr., Alexandria, Va. 22302
JERRY D. POWELL, 43105 Continental, Fremont, Cal. 94536

NIMAS Awards

Gold Cat. II Rubber - 29:21.5, Jim Richmond
Gold Cat. II Rubber - 28:32, Bud Romak

NATS Entry Blank

Your Nats entry blank (which you dutifully sent off for after my admonition here before) is due (postmark) on or before June 30, 1967. Registration is Monday, July 24, at Los Alamitos NAS, and on Tuesday at the Santa Ana hangar where Indoor is held.

INAV Index

That index of all past issues of INAV is now complete, thanks to diligent effort by Hal Crane. We now need a kind volunteer to type it up, so it can be made available to anyone who wants one.

HLG Fudge Factor

The Oct. '66 INAV presented a graph for HLG postal fudge factors as a trial solution to the large inequality which arose when the standard ratio fudge factor is used for sites which differ widely in ceiling heights. A new version of the graph (same curve), larger and with narrow lines for easier use, has been prepared. Those who desire a copy please send a stamped envelope with your request.

FAI INDOOR REPORT

FAI Finals Attendance

The Team Selection Finals will be held in the Pompeian Court of Northwood Institute, West Baden, Indiana 47469. For map-lookers: the above address contacts the right people, but the postmark says West Baden Springs and the telephone exchange center is French Lick, Indiana. This should help you find it on the map.

Written confirmation of the arrangements has been received, and it seems probable that on-site housing will be available. Anyone besides qualifiers who wishes to attend should notify Bud Tenny, Box 545, Richardson, Tex. 75080 as soon as possible. There may be some limitation on how much housing is available, and of course officials will be considered first. However, it should be a tremendously exciting contest with extremely good flying, and most any indoor flier would enjoy being a spectator or official. So, let me know if you will want to go, and if you wish to help with the meet please say so.

FAI Indoor Participation

To the best of my information, 86 fliers entered local qualification trials this year. This compares to 90 in 1962, 83 in 1963 and 71 in 1965. This increase in entries over recent years is heartening, and is due partly to a few who entered the local trials with no intention of going on to the Quarter Finals. Thank you, fellows - you know who you are! On the other hand, a few fellows were at local trials, flying 65 cm models, who did not enter. If these had entered, in each case a serious flier who had bad luck at that particular meet could have advanced to the next round. The $1.50 local trial entry fee was set low to encourage such entries. It is hoped that in the next program these fliers will enter and help advance the program.

Correction, Please

A worried flier who qualified at the April 30 Akron session wondered if I was correct in calling it the "2nd Local Team Qual." I wasn't - sorry about that! It was a Quarter Finals and he is qualified into the Semi.

Team Selection Trials Schedule

EAST COAST - Lakehurst - June 11, 1967 C. V. Russo, 143 Willow Way, Clark, N. J. 07066
NORTH CENTRAL - Detroit - June 18, 1967 Pat Green, 16880 Woodbine, Detroit, Mich. 48219
SOUTH CENTRAL - Tulsa, Oklahoma - June 18, 1967 CD Bud Tenny; Tulsa contact - Bob Hanford, 3838 South 88th East Ave., Tulsa, Okla. 74145
WEST COAST - Cow Palace - June 18, 1967 Bud Romak, 85 Sullivan Dr., Moraga, Cal. 94556

Qualification Trial Results

COW PALACE QUARTER FINALS - May 13, 1967			
Carl Rambo	23:45	20:42	44:27
Lew Gitlow	25:18	17:18	42:36
Erwin Rodemsky	22:12	20:02	42:22
Bob Meuser	20:10	18:01	38:11
DALLAS QUARTER FINALS - May 13, 1967			
Jim Clem	9:27	10:30	19:57
Kristi Tenny	9:49	8:40	18:29
Bob Putman	5:49	9:16	15:05
TULSA QUARTER FINALS - May 13, 1967			
John English	7:35	8:12	15:47
Bob Hanford	6:34	6:04	12:38
Stan Chilton	7:45	4:50	12:35
DETROIT QUARTER FINALS - May 21, 1967			
Hardy Brodersen	20:12	20:12	40:24
Pat Green	19:44	20:27	40:11
Joe Servaites	19:31	19:37	39:08
Ed Stoll	19:18	18:56	38:14
Ned Smith	17:10	16:43	33:53
Tim York	15:16	13:43	28:59
LAKEHURST QUARTER FINALS - May 21, 1967			
John Triolo	23:55	24:39	48:34
Tom Vallee	20:51	24:20	45:12
Ernie Kopecky	20:21	24:05	44:26
Bill Bigge	19:24	23:58	43:22
Pete Andrews	21:36	21:16	42:52
Bob Champine	19:41	20:46	40:27
Manny Radoff	18:47	21:28	40:15
Hal Crane	18:42	19:10	37:52
Julius Rudy	16:53	18:33	35:26

CHICAGO QUARTER FINALS - May 28, 1967
All qualifiers showed up for this event, only to find that the National Guard had pre-empted the Armory for the whole day. No more open dates were available until after Semi-Finals, so special arrangements were made for these qualifiers to combine Q-F and Semi-Final flights at the Semi-Final they attend.

SAN DIEGO QUARTER FINALS - May 30, 1967			
Clarence Mather	9:15	12:07	21:22

RECORDS? MAYBE!

I goofed again! Hal Crane's FAI Cat. I FAI record application was for 13:59, rather than the 14:41 listed last month. The 14:41 flight was made after everyone else had left.

CHICAGO INDOOR CONTEST - May 7, 1967 FAI Cat. III
Washington Park Armory, Chicago 90' AMA Cat. II.
Open C Stick - 29:21.5, Jim Richmond
FAI Cat. III FAI - 29:21, Jim Richmond

Please remember - the continued effectiveness of this column is dependent upon fliers and CD's notifying me of record applications! Otherwise, who knows about the record until the AMA annual publication of records?

STATE OF THE ART

Jim Richmond's Cabin model is in the spotlight this month. The August '66 INAV showed a picture of the model taken during the Nats. The model's 4th place Nats flight (10:33) isn't particularly outstanding until you hear the story. Jim's comments are:

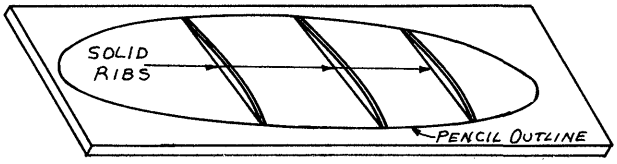
I believe the gear design puts the cross section where it can do some good in producing a sturdy structure with minimum weight. The plane flies very well, but has not had a chance to prove itself yet. The Nats was the only time I've let it fly out of my reach, and then it was badly underpowered and only went up about 30'. I haven't really proven anything with the drooped trailing edge (fence), but I believe the fence enables a wing to generate lift at a lower speed and this could increase flight duration. I use a fence on the stab T. E. of both my Easy B (Ed. note - Jim's Easy B did 14:43 in 90' at Chicago) and my paper stick, and it seems to improve recovery characteristics and prevent undue stalling during the burst.

Hooray for a pioneering effort! I have been trying to find time to apply the fence to indoor rubber and have encouraged Jim to fly this model more. If anyone else tries the fence, I am very interested in your results.

HINTS AND KINKS

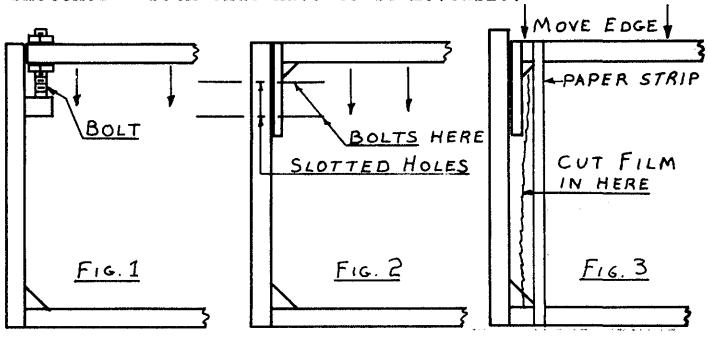
Covering Tip

If your film is slightly tight on the hoop while covering (Bilgri style), it will probably crush or distort the ribs. Al Rohrbaugh places solid ribs on the covering form as shown below. These ribs are located next to the ribs in the surface being covered, and support the film during the covering operation. Take care not to get these solid ribs wet, and make them slightly shorter than the distance between the outlines.



Covering Hoops

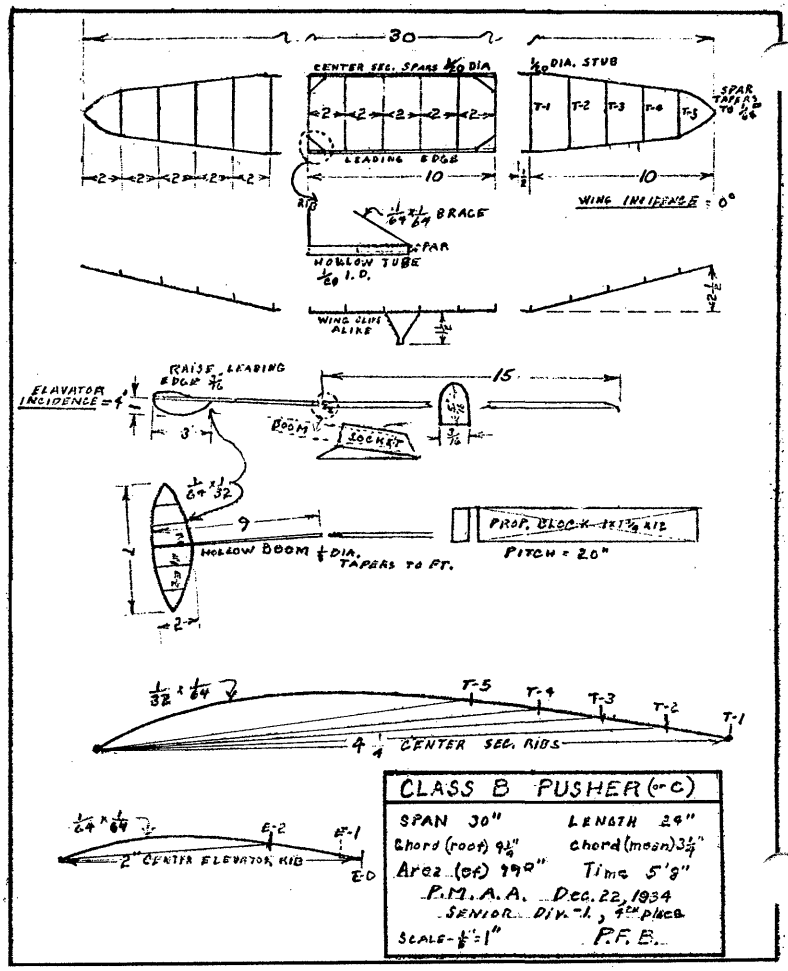
The March '66 INAV showed two methods of slackening film for covering - and here's another method. Vilim Kmoch (Yugoslavia) suggests that one side of the hoop can be mounted on a bolt as shown in Fig. 1 below. Move the side out to the dotted position and lock it while picking up the film. Move it in to the position shown for covering, and the film will slacken. Fig. 2 shows another way of building the hoop to accomplish the same thing. Fig. 3 shows one important item - the film must be cut loose on the end of the hoop so the slack will be uniform across the hoop. It is a good precaution to place a wet strip of paper across the end of the film to keep moving air from disturbing the loose film. Put the paper on and then cut the film loose before moving the side of the hoop. Note that only the left end of each hoop is shown in these sketches - both ends have to be moveable!



A LOOK AT YESTERYEAR

One of the most avid of NIMAS historians, Bill Lindsay, has been frustrated by the fact that much of his most valued and interesting historical information is almost impossible to reproduce by normal methods because of fading ink and general age. The item reproduced below is the pencil original by Paul F. Bickel, who was a very active leader of the Overbrook Model Airplane Club. The OMAC was a chapter of the Philadelphia Model Airplane Association, a group which pioneered in indoor development in the early 1930's.

Reproduction difficulties were solved by special techniques and perseverance on the part of Harry Keshishian. A hearty thanks to Harry for his work, and to Bill for the loan of this document.



NEWS FROM AROUND THE WORLD

HUNGARY

Andras Ree (Budapest) reports that a 65 cm contest was held recently in the W/Ch. site in Debrecen. Seven towns sent teams; partial results are:

1.	Zoltan Ocsody	Debrecen	25:11
2.	Andras Ree	Budapest	24:55
3.	L. Gyarmati	Veszprem	22:33
4.	Karoly Biro	Szekeslehervar	22:29
5.	K. Hajba	Szekeslehervar	22:07
6.	Antal Egri	Budapest	20:48
7.	Gy. Buzadi	Pecs	20:07

Andras told also of the Romanian International indoor contest held in the 60 m salt mine under the Carpathian Mountains. Teams from Hungary and Czechoslovakia entered and the Hungarian team scored high. Partial results:

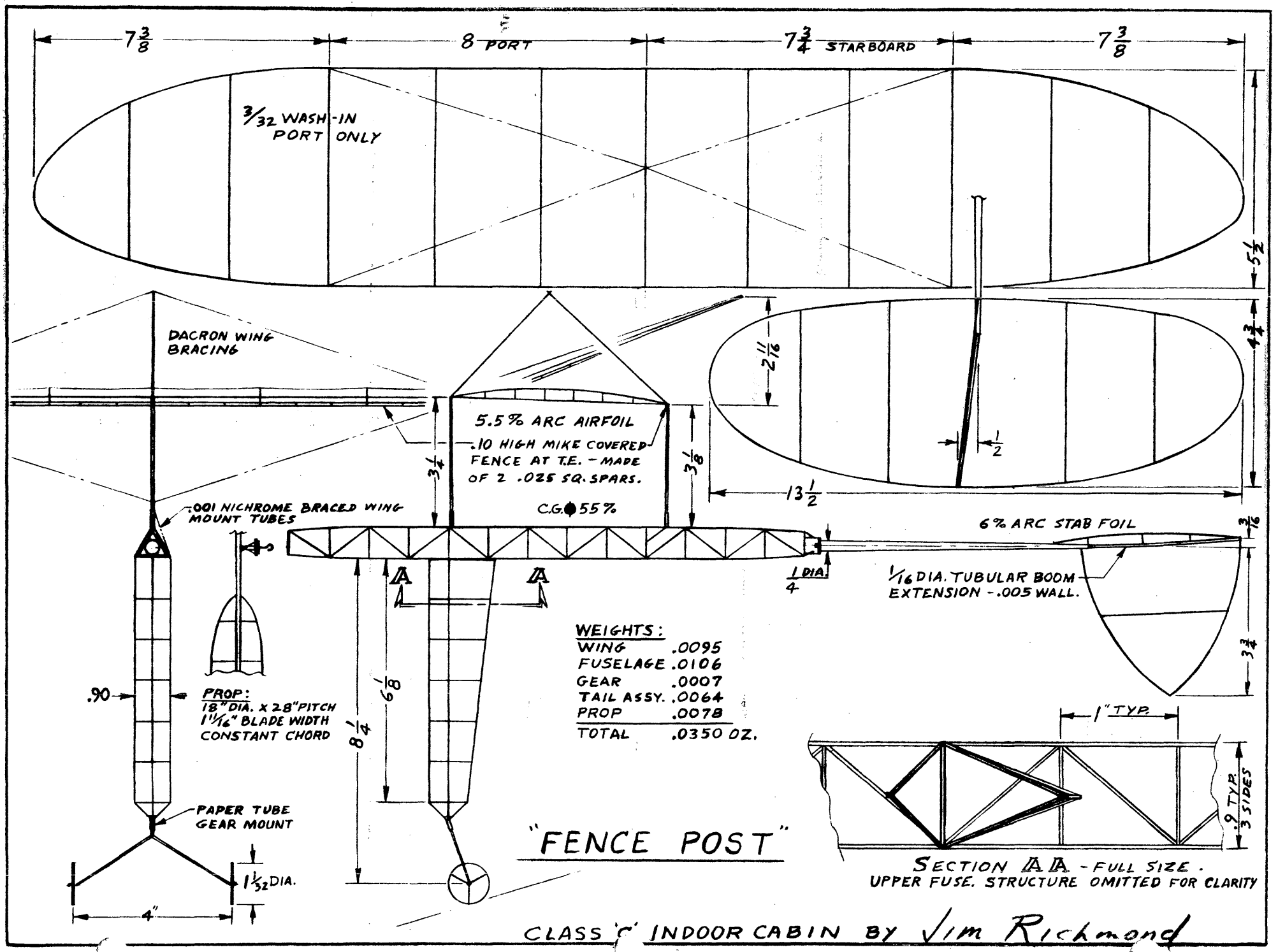
1.	Jiri Kalina	Czech.	27:10 + 26:30 = 53:40
2.	Zoltan Ocsody	Hungary	26:55 + 24:01 = 50:56
3.	Karoly Biro	Hungary	25:30 + 21:00 = 46:30

ILLINOIS - CHICAGO

May 7, 1967, at the Washington Park Armory, another "contestant sponsored" indoor contest was held. This is to say that the contest was supported out of entry fees and cash donations from the contestants. Twenty contestants entered eight events, including two size classes of HLG (under 30 sq. in. and over 30 sq. in.). Winners: "A" HLG Jr. - 0:41.0, Ricky Lyons; "A" HLG Open - 1:38.6, Bob DeBatty; "B" HLG Jr. - 1:09.3, Carl Johnson; "B" HLG Open - 1:57.0, Dick Ganslen; Jr. Easy B - 4:09.8, Ricky Lyons; Open Easy B - 12:37, Jim Richmond; Paper Stick - 18:53, Jim Richmond; Indoor Stick - 29:21.5, Jim Richmond.

MICHIGAN - DETROIT

48 contestants entered the annual Michigan Indoor State Meet, flying in eight events. Conditions were turbulent early in the day, but settled down before the end. The winners: Jr. HLG - 1:02.4, Art Markiewicz; Open HLG - 1:25.9, Len Stress; Jr./Sr. Paper Stick - 11:30, Linda Randolph; Open Paper Stick - 17:24, Bob Randolph; Jr./Sr. Indoor Stick - 14:32, Art Markiewicz; Open Indoor Stick - 21:58.5, Bob Randolph; Jr./Sr. Flying Scale - 120.5 points, Steve Macisaac; Open Flying Scale, 136 points, Bruno Markiewicz.


7 3/8
8 PORT
7 3/4 STARBOARD
7 3/8
3/32 WASH-IN PORT ONLY
5 1/2
DACRON WING BRACING
5.5% ARC AIRFOIL
.10 HIGH MIKE COVERED FENCE AT T.E. - MADE OF 2 .025 SQ. SPARS.
C.G. 55%
3 1/4
3 1/8
2 11/16
4 3/4
1/2
13 1/2
.001 NICHROME BRACED WING MOUNT TUBES
6% ARC STAB FOIL
3/16
1/4 DIA.
1/16 DIA. TUBULAR BOOM EXTENSION - .005 WALL.
3 3/4
A
A
WEIGHTS:
WING .0095
FUSELAGE .0106
GEAR .0007
TAIL ASSY. .0064
PROP .0078
TOTAL .0350 OZ.
.90
PROP:
18" DIA. x 2.8" PITCH
1 1/16" BLADE WIDTH
CONSTANT CHORD
6 7/8
8 1/4
PAPER TUBE GEAR MOUNT
1 1/32 DIA.
4"
1" TYP.
.9 TYP. 3 SIDES
"FENCE POST"
SECTION AA - FULL SIZE.
UPPER FUSE. STRUCTURE OMITTED FOR CLARITY
CLASS 'C' INDOOR CABIN BY Jim Richmond

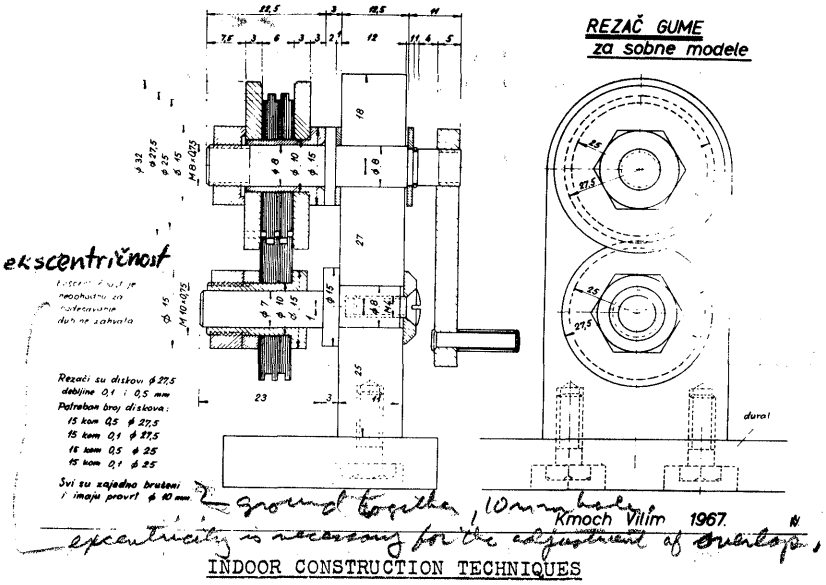
9: 5/16 12: 1/2 15: 5/8 6: 1/4

YUGOSLAVIAN RUBBER STRIPPER

Vilim Kmoch, of Zagreb, Yugoslavia, was one of the fliers who borrowed my Roto-Shear at Debrecen last year. He later decided to modify the cutter concept of the Roto-Shear (see Mar. '67 INAV) to make a stripper with more range of adjustment. In case the presentation below does not come out clear enough, I will furnish a photostat to those who request same. Anyway, the major difference in Vilim's cutters is that they are built up from many thin disks which have been ground to the proper diameter. His machine also has an eccentric lower shaft to permit adjustment of the degree of mesh or overlap in the cutter head; this would be an excellent addition to Roto-Shear.

Vilim made these comments on construction of this type of cutter: "It is only necessary to stamp (on a rubber base) disks from steel plate (thickness 0.1 mm, 0.4 mm and 0.5 mm) and grind them to final diameter all at once." Note that the disks are of two diameters, 25 mm and 27.5 mm, and 15 of each thickness are made in each diameter. ≈ 90 pieces.

The results with this stripper have been outstanding; he has cut strips in virtually all sizes from 0.3 mm wide (.012") up to the largest size he has needed.



INDOOR CONSTRUCTION TECHNIQUES

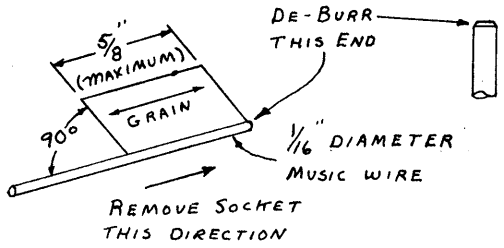
This is a new column, of occasional nature, which will have articles pertaining to new or standard construction methods. The material below is a reprint from an early issue of INAV.

Tissue Sockets

Rolling tissue sockets is mostly a matter of practice and timing. By timing I mean that once started, you must complete the job quickly and without hesitation. It is possible to increase your yield by careful attention to a few details. The first and most important is the wire form - use 1/16" music wire which has been polished with steel wool or fine wet-or-dry sandpaper. The end should be chamfered and de-burred as shown in the sketch below.

Careful preparation of the tissue will also make your job easier. First, don't make long sockets - 5/8" is as long as is ever needed, and longer sockets are difficult to remove from the form. Second, use jap tissue and be sure the grain is running lengthwise of the finished socket. Cut several pieces of tissue 5/8" wide and 1" to 1 1/4" long (grain running in the direction of the 5/8" dimension), being sure that the edges are square.

Now for the actual rolling operation. Put some thin glue on the form and lay the form on to the edge of one of the tissue pieces with the edges of the tissue perpendicular to the form as shown below. From now on you must waste no time. Check to see that the tissue is stuck to the form, spread a layer of thin glue over the tissue, roll the form forward so at least one layer of tissue rolls up on the form, pick up the form and twirl it between thumb and forefinger so the rest of the tissue rolls up evenly. Continue twirling until the end of the tissue sticks down and the excess glue is squeezed out. Immediately push the socket off the form and let it drop to the table. If you hesitate, the glue at the end of the form will make it stick. If you start with the piece of tissue right at the end of the form, the tendency to stick will also be reduced. That's all there is to it; except be sure to clean the form before rolling the next one. The finished sockets must dry at least an hour over a lamp or overnight before they are cut to length. When you cut them to length, trim one end and then cut the length so both ends will be sharp and square.



THE TRAINING OF A CHAMPION

(cont. from May)

Nurnberg 3/14/1966

Dear Karlheinz!

Many thanks for your letter and your kind offer to help me. I would have limited me in any case to build your models, especially in respect of the very short lapse of time till the world championship at Debrecen. It will be the best solution. I think I will succeed in building the models without your physical aid, especially with your devices and jigs.

Nevertheless I have some questions which you will please answer with your next letter. What kind of microfilm mixture is the best to your opinion? How old the films for wing and stab should be? How do you brace the wing and stab? Perhaps you can sketch me the different steps one by one. How did you cut your rubber?

Could it be possible, when I have succeeded in building my first model, to come to Berlin and fly under your assistance in the "Deutschlandhalle"? We have here at Nurnberg only an exhibition hall which is only 11 m high. Besides a lot of girders and chandeliers it is difficult to come into the site, all in all not really ideal.

I am impatiently waiting for your "lumber".

Best regards,
Hans

Berlin 3/17/1966

Dear Hans!

Many thanks for your letter. I have searched for all kind of indoor "lumber" and collected what I could find for you.

So I sent today to your address two children's coffins. In the big one are all kind of jigs and other materials. In the smaller one are my old models which I used at Cardington. The wings and stabs are absolutely useless because of gigantic warps which wandered in the models in the last three years. But you can see all the different dimensions of the various parts of an indoor model. You can also see the color of the microfilm. Of course you can destroy the models completely, so you can learn details you can not see from the outside. Don't be astonished about the big transportation box. To our experience it is absolutely necessary to have three good models for an international contest. Either stored in two smaller boxes or in one bigger which is more advantageous because you then have one free hand for a suitcase. Since in such a box all the fuselages are on the bottom and the wings are in the lid the assembly is very easy. In the smaller boxes where all the parts are in the lower part of the box, assembly of the models is much more difficult.

Of course I will make an arrangement for the Deutschlandhalle. But you should have at least three models so your travel to Berlin should pay. In this respect there is a good method to fly in low ceilings with full turns: the very short rubber (one third as usual) is lengthened to the rear hook by a wire, of the same weight as the rubber.

For training and flying it is very useful to knot a little ring (Ed. note: an "O"-ring) in the rubber motor. This way it is much easier to remove rubber with still lots of turns, from the rear hook.

The rubber-cutter which I sent you can only be armored with the sharpest razor blades otherwise it would produce an uneven cut. Additionally the position of the blade must constantly be changed after a few meters of rubber cutting. When the blade gets dull, you can hear it in the form of a certain faint crackling.

Best regards,
Karlheinz

OFFICIAL AMA INDOOR RECORDS

as of May 29, 1967

Category I

CLASS A R.O.G.

J -	B. DeShields	6:55.1
S -	L. Loucka	8:30.0
O -	H. Entrop	12:10.0

PAPER STICK

J -	L. Randolph	8:28.0
S -	W. Skinner	8:50.0
O -	R. Randolph	11:36.0

CLASS B STICK

J -	B. DeShields	8:57.6
S -	L. Renger	10:38.6
O -	H. Phillips	16:59.0

CLASS C STICK

J -	B. DeShields	7:02.0
S -	J. Gaffrey	9:48.4
O -	J. Kagawa	14:09.0

CLASS D STICK

J -	L. Randolph	7:28.0
S -	T. Neumann	14:36.1
O -	R. Randolph	16:05.5

CLASS B CABIN

J -	J. skarzynski	5:08.4
S -	N. Shipley	9:19.6
O -	D. Stamm	7:12.1

CLASS B CABIN ROW

J -	--	-
S -	D. Erbach	3:31.2
O -	R. Ganser	4:51.0

CLASS C CABIN

J -	R. Ganser	3:48.0
S -	L. Loucka	9:12.0
O -	R. Ganser	9:15.0

AUTOGIRO

J -	H. Schubert, Jr.	2:25.5
S -	E. Smith	2:40.5
O -	R. Ganser	4:19.0

HELICOPTER

J -	D. Erbach	3:52.4
S -	N. Jones	6:31.0
O -	W. Erbach	6:32.2

ORNITHOPTER

J -	D. Erbach	0:30.1
S -	E. Smith	2:41.4
O -	R. Ganser	3:07.0

H. L. GLIDER

J -	B. Schubert	1:01.0
S -	B. Schubert	1:13.8
O -	R. Wittman	1:11.5

F. A. I.

J -	--	-
S -	-- *	-
O -	H. Phillips	16:59.0

Category II

CLASS A R.O.G.

J -	D. Chancey	8:10.9
S -	L. Loucka	10:19.5
O -	T. Finch	12:28.8

PAPER STICK

J -	J. Thornbery,Jr.	14:58.1
S -	L. Loucka	16:03.2
O -	P. Klintworth	19:41.0

CLASS B STICK

J -	L. Randolph	14:35.4
S -	D. Erbach	17:16.8
O -	P. Klintworth	20:58.0

CLASS C STICK

J -	T. York	19:46.0
S -	L. Loucka	19:18.5
O -	R. Plotzke	23:29.4

CLASS D STICK

J -	R. Roharik	20:37.0
S -	J. Skinner	22:59.2
O -	D. Kowalski	29:47.4

CLASS B CABIN

J -	J. Skarzynski	7:15.0
S -	D. Erbach	11:31.8
O -	W. Erbach	13:52.2

CLASS B CABIN ROW

J -	D. O'Malley	4:30.6
S -	D. Erbach	7:44.7
O -	W. Williams	9:15.8

CLASS C CABIN

J -	D. Erbach	7:35.8
S -	L. Loucka	18:06.4
O -	C. Sotich	17:54.8

AUTOGIRO

J -	H. Schubert,Jr.	2:10.0
S -	D. Erbach	5:02.2
O -	W. Erbach	6:32.8

HELICOPTER

J -	D. Erbach	3:47.2
S -	N. Jones	6:30.3
O -	W. Erbach	5:50.8

ORNITHOPTER

J -	D. Erbach	1:29.7
S -	D. Erbach	1:15.0
O -	R. Ganser	2:21.1

H. L. GLIDER

J -	B. Schubert	2:12.1
S -	B. Schubert	2:14.1
O -	R. Larsh	2:04.8

F.A.I.

J -	L. Randolph	11:40.0
S -	--	-
O -	J. Richmond	29:21.5

Category III

CLASS A ROG

J -	A. Saltzman	10:09.0
S -	R. Harlan	15:01.4
O -	J. Foster	21:52.0

PAPER STICK

J -	L. Randolph	19:03.0
S -	R. Harlan	19:48.6
O -	F. Cummings, Jr.	24:52.2

CLASS B STICK

J -	R. Cummings	24:03.0
S -	D. Kennedy	25:37.6
O -	T. Finch	34:15.6

CLASS C STICK

J -	B. DeShields	27:17.0
S -	R. Harlan	26:38.4
O -	T. Finch	39:55.0

CLASS D STICK

J -	D. Champine	25:45.4
S -	D. Morris	30:26.0
O -	E. Kopecky	43:42.0

CLASS B CABIN

J -	H. Kaczynski	12:42.4
S -	R. Harlan	18:24.4
O -	F. Cummings, Jr.	25:44.0

CLASS B CABIN ROW

J -	S. Stackhouse	3:06.4
S -	D. Call	13:13.0
O -	A. D'Alessandro	17:20.0

CLASS C CABIN

J -	R. Richmond	18:33.3
S -	R. Harlan	19:21.8
O -	J. Bilgri	29:06.3

AUTOGIRO

J -	E. Vargo	3:53.8
S -	D. Erbach	5:27.4
O -	J. Triolo	8:08.0

HELICOPTER

J -	C. Lee	4:38.2
S -	E. Smith	6:45.6
O -	H. Cover	8:11.0

ORNITHOPTER

J -	E. Vargo	1:18.0
S -	J. Bock	3:22.0
O -	C. Goldberg	4:05.4

H. L. GLIDER

J -	R. Richmond	2:08.8
S -	J. Manczuk	2:01.3
O -	C. Stevens	2:50.4

F. A. I.

J -	--	-
S -	--	-
O -	--	-

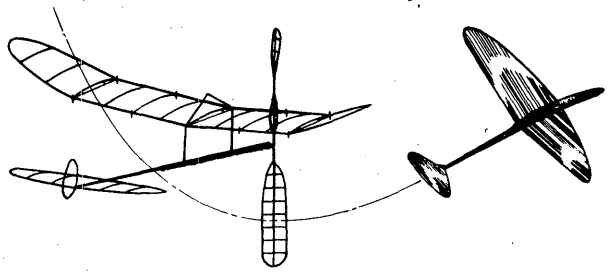
* indicates possible record
N. Shipley 15:46.0

U.S.A. F.A.I. Records
(FAI Ceiling Categories)

I	Hal Crane	13:59.0
II	Bob Wilder	10:05.0
III	Jim Richmond	29:21.5
IV	- -	-

The Voice of N.I.M.A.S. JUL·1967

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

JOHN E. ENGLISH, 4233 East 52nd Place, Tulsa, Oklahoma
JAMES H. GARDNER, R. R. 1, Vinita, Okla. 74301
CHRIS SOENKSEN, 141½ Seymour Ave., Mundelein, Ill. 60060

The August Issue

This issue is early, to permit me to wind up many last-minute details with both the Team Selection Program and the Free Flight Contest Board. The August issue will doubtless be late, after Aug. 15 almost surely. Please bear with us - I expect to have reports on the FAI Indoor Finals and the Nats.

Junior NIMAS Awards

One of the benefits of NIMAS membership has been closed, actually if not intentionally, to the young members (sponsored Juniors and family members) on NIMAS. This is the NIMAS Award Program. The goals, set to be worthy goals for the serious flier, are beyond the reach of all youngsters except prodigies. On the advice of the NIMAS Advisors, the following standards are set up as fitting goals for our Juniors:

Indoor Stick (Any class indoor model; single flight)

AWARD	Cat. I	Cat. II	Cat. III
Silver	7:30	15:00	21:00
Gold	9:30	18:45	26:30
Diamond	11:15	22:30	31:30

Indoor HLG (Best single flight of nine)

AWARD	Cat. I	Cat. II	Cat. III
Silver	0:18	0:34	0:41
Gold	0:22.5	0:41	0:49
Diamond	0:27	0:49	0:56

The same general standards will apply to the conditions for these awards - flights at sanctioned contests are eligible, as are flights under conditions which would meet AMA contest standards. The flights should be witnessed by an AMA CD or two AMA members. Forms for award application are available from Box 545, Richardson, Tex. 75080

NIMAS Awards

Silver Act. II Rubber - 20:33.6, Al Rohrbaugh

Dick Black Memorial

Shortly after Dick Black's untimely passing, a special fund was established in his memory. The intent was (and remains) to perpetuate Dick's memory in a meaningful and lasting fashion. Similar moves by NFFS and by Walt Schroder were off and running slightly ahead of the NIMAS planning effort, and much of their planning is complete and awards have been announced.

The NIMAS Advisors have discussed many types of memorials; certain standards for the memorial have been set up. If it is an award, it should be awarded for such reasons that it would not go unclaimed. The form should be such that an active reminder of Dick's life and accomplishments is made. Finally, basis for making the award would be objective rather than subjective. Another possible type of memorial could be a service performed in Dick's name - and this is also under consideration. The question of when is a fair one - one Advisor said "You are stuck with the final decision, whether it is good or bad." Thus, a strong effort to insure a proper and lasting memorial is being made, and will be announced as soon as possible.

Meanwhile, further donations are in order, and will only enhance the meaning of our effort. Make checks payable to Ralph Tenny, and mark them "Dick Black Fund". A special report will be made to all donors, showing amounts donated and disbursement made.

FAI INDOOR REPORT

Qualification Trial Results

As announced last month, the Chicago Quarter Finals were cancelled by loss of the intended site at the last minute. The Chicago qualifiers were permitted to combine their Q-F and Semi flights at either the Tulsa Semi or the Detroit Semi; standard qualification procedures were used based on the first three rounds of the Semi. The qualifiers were:

Tulsa section

Ed Capogreco	13:54	13:00	26:54
Dick Ganslen	9:33	12:18	21:51
Lou Willis	8:58	10:48	19:46
Paul Tryon	7:40	6:51	14:31

Detroit Section

Al Rohrbaugh	21:45	21:26	43:11
Jim Richmond	14:44	27:52	42:36
Wayne Zink	15:32	17:27	32:59
Curtis Janke	9:16	16:47	26:03

Semi-Final Results

Lakehurst Semi-Finals 106' Ceiling

Ernie Kopecky	24:56	24:40	49:36
Bob Champine	25:41	23:46	49:27
Ron Ganser	24:24	24:43	49:07
*Manny Radoff	24:11	23:47	47:48
John Triolo	22:54	24:38	47:32
Harry Lerman	23:29	22:56	46:25
Ray Harlan	22:33	22:53	45:26
Dave Martin	22:39	22:28	45:07
Tom Vallee	22:41	21:58	44:39
Hal Crane	20:36	21:25	42:01
Bill Bigge	22:42	14:30	37:12
Julius Rudy	19:39	17:07	36:46

Hot and humid conditions at Hangar #2 apparently held times below expectations, and late in the day lengthwise drift built up. Bob Champine put up his first officials and waited for the rest to catch him. Ernie Kopecky did it in round 4, with a 9 second lead, and Ron Ganser's 4th flight missed Bob's time by only 20 seconds. These three times were the closest set of qualifying times in the entire team selection program. Unofficial information showed the highest time of the day was by Jim Vale, whose new FAI ship did 25:58 late in the day. Record performances in Autogyro and Ornithopter by Fred Weitzel capped the day and rewarded long effort on his part. His "flapper" record beat the 20+ year old record set by Carl Goldberg. Congratulations, Fred!

Western Semi-Finals 99' 6" Ceiling

Erwin Rodemsky	22:47	25:58	48:45
Clarence Mather	21:46	24:46	46:32
Carl Rambo	22:54	18:35	41:29
*Lew Gitlow	19:31	17:44	37:15
Bob Meuser	0	0	0

The Western Semi was somewhat hampered by a work crew who had the doors open most of the day. This increased drift at floor level and many flights ended in the bleachers. Even so, the low entry reduced the pressure of time and everyone enjoyed themselves.

Detroit Semi-Finals 65' Ceiling

Jim Richmond	27:52	24:25	52:17
Al Rohrbaugh	22:48	25:35	48:23
Joe Hindes	21:37	22:28	44:05
*Ed Stoll	20:04	21:40	41:44
Bob Randolph	22:47	17:56	40:43
Joe Serviates	19:50	18:31	38:21
Bill Hulbert	17:40	18:40	36:20
Pat Green	16:50	17:04	33:54
Wayne Zink	15:32	17:27	24:34
Curtis Janke	16:47	15:55	32:42
Hardy Brodersen	17:11	15:17	32:28
Tim York	11:19	13:05	24:24

Test flying on Saturday, party at Hardy Brodersen's, and flying (bleary-eyed?) on Sunday - the usual pattern for a Detroit Semi was followed closely. However, the conditions on the two days were quite different, and no one really got zeroed in via the test flying. Conditions were good, but each flier flew alternate rounds on opposite sides of the speaker array in the center to assure equality of conditions.

Tulsa Semi-Finals 41'(FAI) Ceiling; 55' 6" (AMA) Ceiling

Stan Chilton	17:15	16:00	33:15
Jim Clem	16:11	14:50	31:01
Dick Ganslen	14:19	16:28	30:47
*Ed Capogreco	13:54	13:00	26:54
Lou Willis	13:37	13:12	26:49
Kristi Tenny	9:41	10:32	20:13
Paul Tryon	7:40	10:01	17:41
John English	2:53	8:26	11:19
Bob Hanford	0	0	0

Superb conditions in a slightly cramped site, good cooperation on the part of all concerned, and a congenial atmosphere made the Tulsa Semi very enjoyable. Very few models were captured by the "iron" overhead, and only two models were severely damaged in hang-ups. The worst casualty was Stan Chilton's reserve model, which was totalled in retrieval attempts after it hung on an almost invisible wire. Ed Capogreco drove the others slightly batty with an all-balsa prop which served very well for the props he didn't get finished, and Jim Clem was heard to mutter something about "can't seem to beat a wooden prop!"

*Alternates; will advance to qualifier status if a qualifier from the same Semi does not confirm intent to compete.

FAI Finals Attendance

It is evident from the results above that the Team Selection Finals should be an indoor contest unequalled in competition excellence. Anyone wishing to attend should make the necessary arrangements (contact Bud Tenny, Box 545, Richardson, Texas 75080) before July 12, 1967.

STATE OF THE ART

The most outstanding model to come out of the Indoor Team Selection program to date has been Jim Richmond's FAI model. It has dominated competition whenever it has flown, and has done this while leading a charmed life. That is, no one has reported that the model ever hung - if this is true, perhaps even higher times would have resulted from rafter-banging! People who have examined the model see no startling innovations, and Jim's own comment reveals nothing extremely unusual: "The FAI model is a beautiful flyer. The 29:21.5 flight (FAI Cat. III FAI record and AMA Cat. II C Stick record) was the first one of the day with no previous testing. It was able to climb out at a very steep angle with no stall tendencies. The flare prop design (cross-hatch plan below; full size outline available by including stamped envelope with request) makes it possible to use almost all the useful turns in the rubber. The plane descends with its nose pointed upward slightly, as advocated by Charlie Sotich, so that the prop thrust contributes somewhat to the lift. Statistically, the only unusual features are the long motor stick and low wing loading. The need for low wing loading is self-evident, but the long motor stick forces the motor to deliver more torque. A relatively small turn radius is used and the left wing has about 1/4" washin."

INDOOR RULES

The 1967 Nats will be the scene of the first in-person face-to-face meeting of the various Contest Boards. This is an eagerly awaited event which should increase effectiveness of the various Contest Boards and reduce the paperwork handling by AMA HQ and the costs associated with all the mail voting and paper shuffling of the Contest Boards. Details of the Contest Board meetings are given on page 35 of the Aug. '67 American Modeler. As the new system is phased in, AMA members wishing to comment on rules proposals will need to keep close watch on the Model Aviation section of American Modeler for details of proposals as they are announced. Meanwhile, the following indoor rules have been submitted for FFCB action:

FF67-A-1 (Modernization of Indoor Rules)
This proposal originated with the Indoor Advisory Committee which was formed in 1963 by request of the Exec. Council to update the indoor rules. It has been accepted by the FFCB as a delayed action proposal, which means the final action on the proposal would come at the 1968 Nats.

The basic proposal establishes one AMA class (model size) for Indoor Stick, Indoor Cabin, Paper Stick, eliminates Rise Off Water Cabin and retains A ROG, Helicopter, Ornithopter and Autogyro. FAI Indoor is retained also; the class specifications of this event are beyond the control of AMA. Exact details of the proposal will be given in future issues of INAV; many details were presented in the July '65 INAV.

FF67-A-2 This sub-proposal would change AMA scoring to the longest single flight of six official flights; each attempt (six attempts permitted) would be official.

FF67-A-3 This sub-proposal would change the wording of the second sentence of Par. 8.17 to read: When the model hits an obstruction which prevents further flight, or when the model hits an obstruction or another model which throws the model out of adjustment, thereby altering it flight pattern, the contestant shall have the option of declaring the flight to be unofficial.

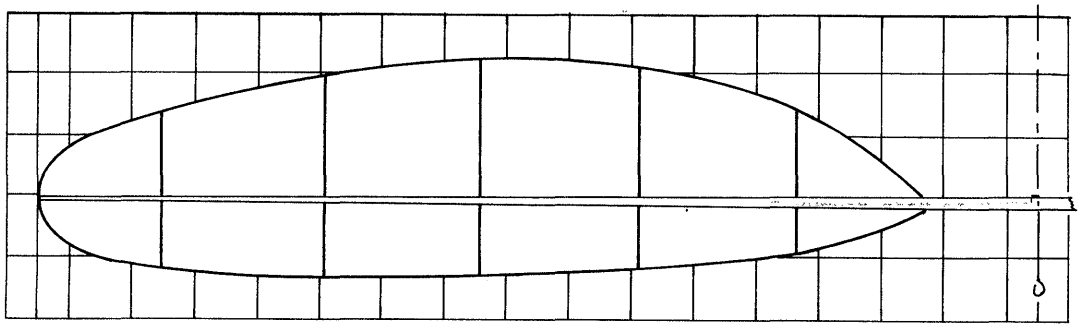
FF67-B-1 This proposal clarifies the wording of Sec. 8.12 with regard to wing area/rotor area specifications and redefines certain aspects of rotor action.

Also to be considered by the FFCB are FF66-D-2 and FF66-E-2; details on page 38, July '67 American Modeler.

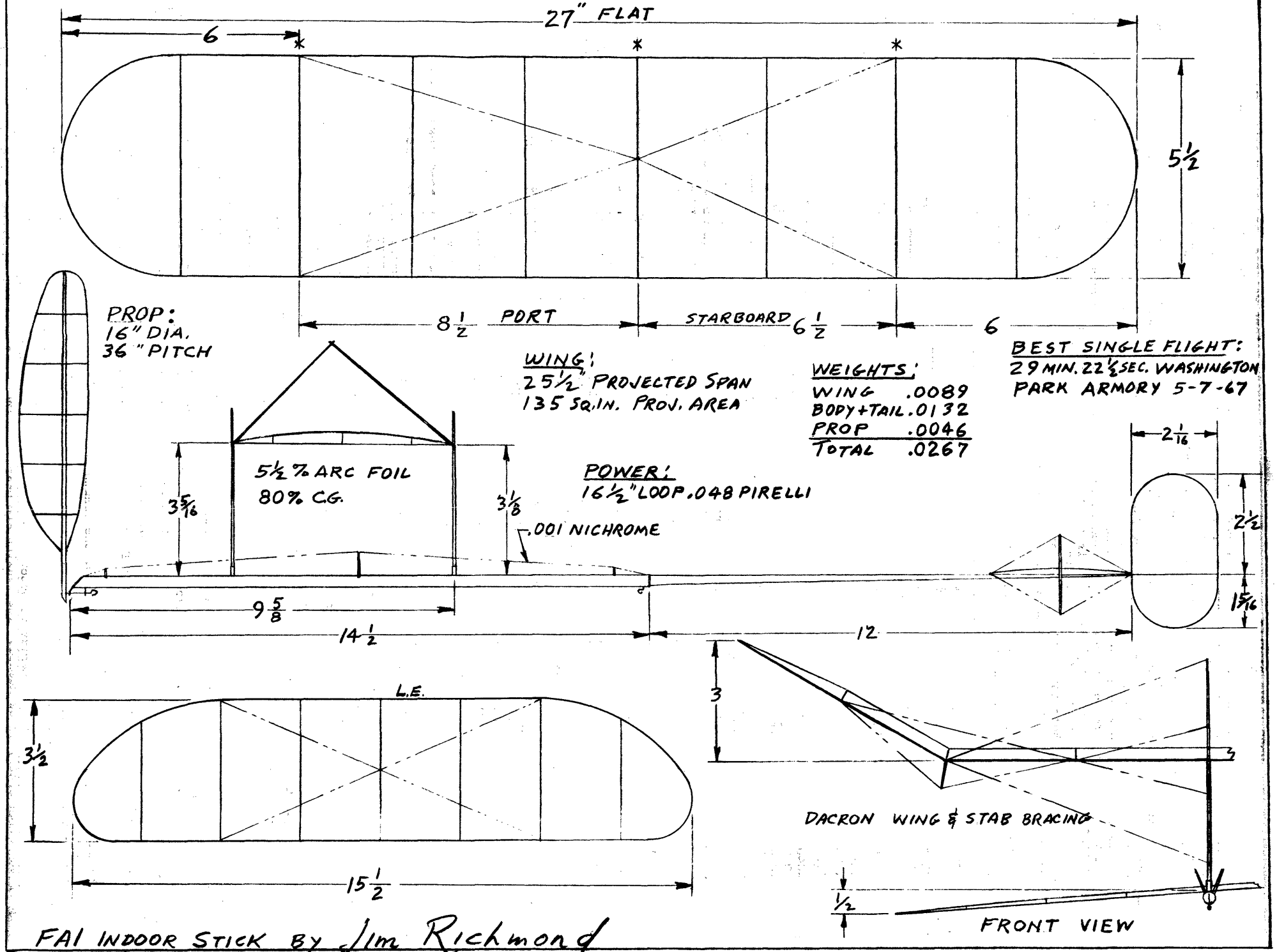
RECORDS? MAYBE!

LAKEHURST SEMI-FINALS - June 11, 1967 AMA Cat. III
Hangar #2, Lakehurst, 106' ceiling. FAI Cat. IV
Open Ornithopter - 4:30.5, Fred Weitzel
Open Autogyro - 8:27.0, Fred Weitzel
DETROIT SEMI-FINALS - June 18, 1967 AMA Cat. II
State Fair Coliseum, 65' ceiling FAI Cat. III
Open B Cabin - 18:25, Al Rohrbaugh
Open B Stick - 22:47, Bob Randolph
TULSA SEMI-FINALS - June 17-18, 1967 55' 6" AMA Cat. II
Nat'l Guard Hangar, 41' FAI Cat. II
Junior FAI Indoor - 12:12, Kristi Tenny
Open FAI Cat. II FAI - 17:15, Stan Chilton

The record listing on page 5 of the June '67 INAV had at least one error - Jim Richmond's 29:21.5 flight was submitted for AMA Cat. II C Stick and exceeds the time listed for this record.



FAI PROP
16" dia. x 36" pitch
Weight: .0046 oz.
Spar: .068" x .110"
tapered to 1/32" square.
Jim Richmond

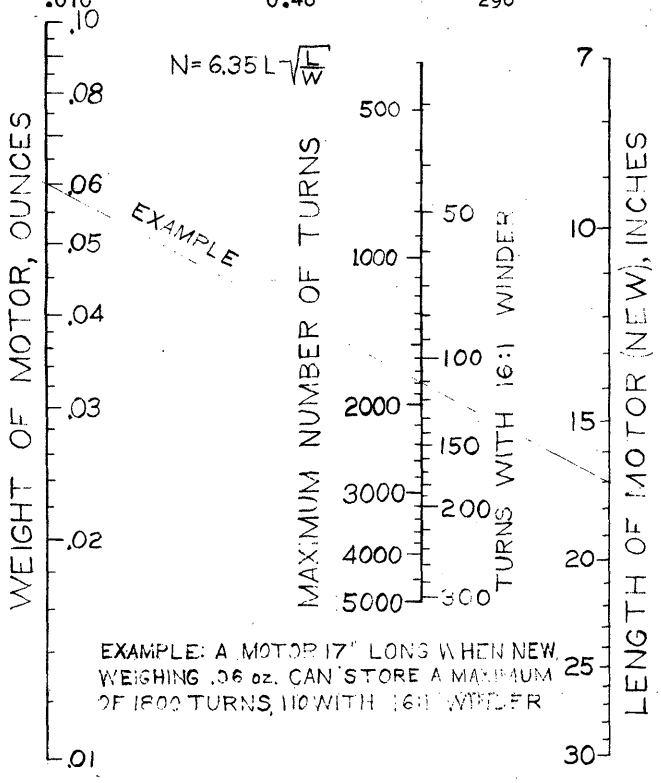


FAI INDOOR STICK BY Jim Richmond

MORE ABOUT PIRELLI

The entire story of how to use pirelli rubber (how to break in a motor, cross-section vs. loop length vs. rubber weight/model weight ratios, how to store rubber, how to vary application of power for different ceilings) seems to be a mass of conflicting "old wives'" tales. I have been advised to store rubber in the refrigerator, and I have been told this is wrong. I have been advised to wash the motors after use, and other fliers store motors for long times without washing. Some fliers almost always back off turns while flying and others vary only cross-section and loop length to adjust for different ceilings and flying conditions. About all most people agree on is the number of turns a motor will take, and a guide to this magic number is presented below. Both the chart and the nonogram were submitted by Charlie Sotich; the nonogram first appeared in Jan. '63 INAV.

Rubber Size in Inches	Weight/inch of 2 Strands in oz./1000	Turns/Inch (2 strand motor)
.100	4.60	94
.095	4.37	96
.090	4.14	99
.085	3.91	102
.080	3.68	105
.075	3.45	108
.070	3.22	112
.065	2.99	116
.060	2.76	121
.055	2.53	126
.050	2.30	132
.045	2.07	140
.040	1.84	148
.035	1.61	158
.030	1.38	171
.025	1.15	188
.020	0.92	211
.015	0.69	242
.010	0.46	296



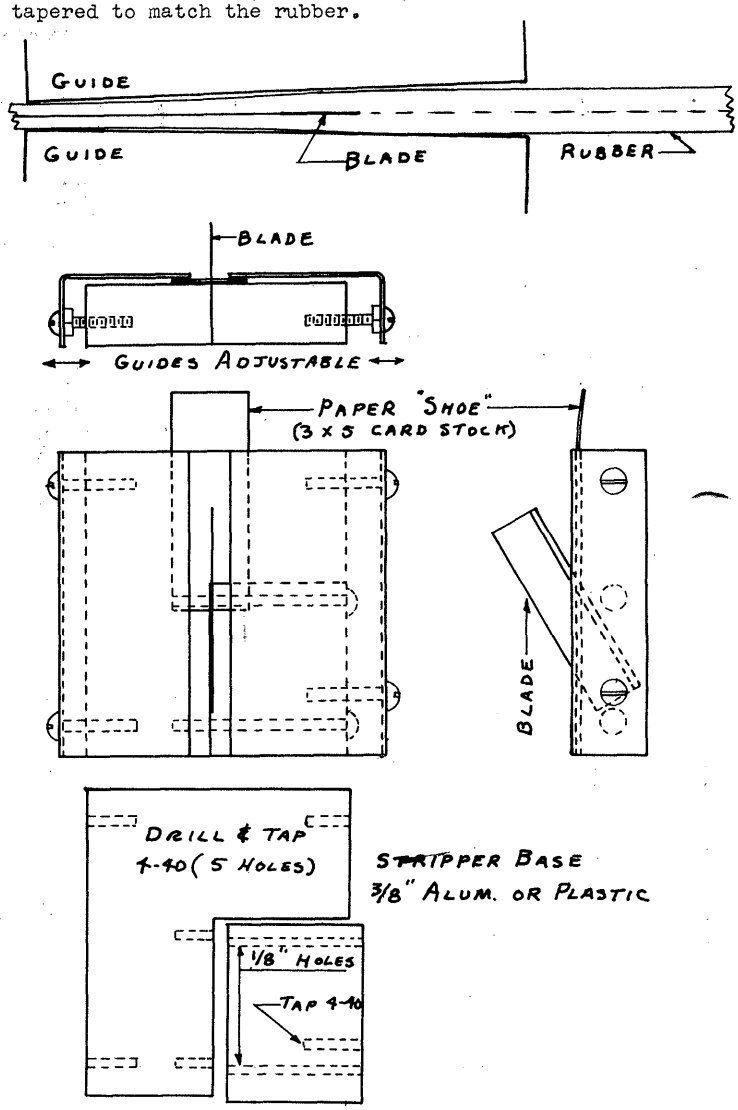
Charlie offers the following supplemental information on use of the weight chart and nomogram: Although I don't strip any rubber, I like to check the size of the rubber I use. Because of variations in thickness and width along the length of a strip, I don't believe in taking a reading with a micrometer is meaningful. Several micrometer readings would be better, provided you can make reproducible measurements.

Weighing a strip of rubber and dividing by the length is a simple method of getting a meaningful average measure of rubber size. It is then easy to detect variations in rubber from different sources.

Before a flying session, a series of motors are made up of the sizes likely to be needed. The lengths are measured, motors weighed, and the weight/unit length determined. This information is recorded on a small envelope in which the motor is stored until needed. The envelope can also be used to record flight and turns information.

RUBBER STRIPPERS

Information continues to come in from all over, ea new bit expanding our practical knowledge in the vital area of rubber cutting. Erwin Rodemsky suggests the device shown below, and he has incorporated two major advances over similar pull-to-cut strippers. First, his construction, where the blade clamp block is removable, makes possible a firm blade mounting and a clean, smooth joint at the cutting edge of the blade. Second, the paper "shoe" shown will further enhance the quality of the seal between the blade and the cutting base, making it less likely for the rubber to creep into the blade slot. The sketch below illustrates an important adjustment for the guides - since the rubber pulls out to a narrow strip as it leaves the blade, the cutting channel should also be tapered to match the rubber.



HINTS AND KINKS

Flight Records

The careful construction records kept by Frank Cummings and Pete Andrews (to name a couple) are almost legendary; it is equally important to keep detailed records of flight performance.

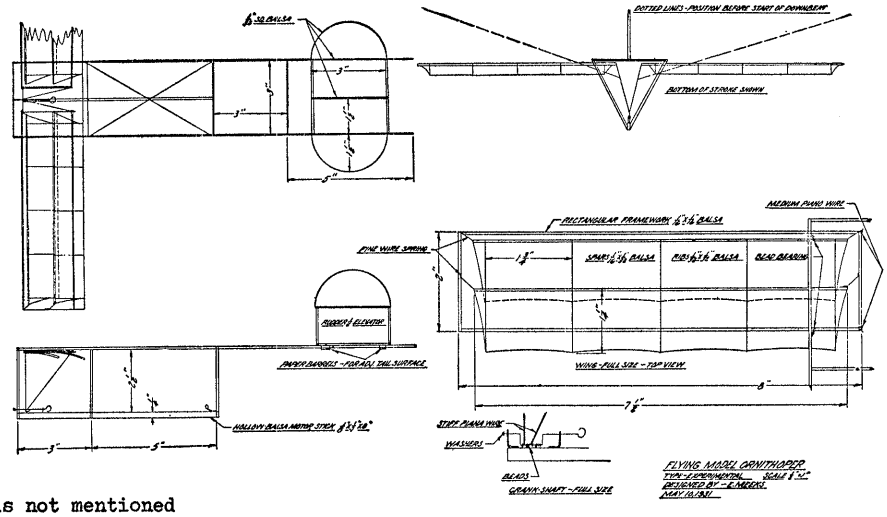
Charlie Sotich keeps records of rubber weight, turn put in, turns backed out, turns left, turns used vs. flight time (RPM), altitude reached, temperature and humidity.

Not only does this wealth of information aid Charlie in planning any given flight, but many times it has let him skip test flying of a well adjusted model if pressed for time at a contest. His long record of highly consistent performance in Cat. II flying speaks well for his careful records and diligent application of them.

FRED WEITZEL ESTABLISHES NEW ORNITHOPTER AND AUTOGIRO RECORDS

From the days of Archytas, the ancient Greek, men have been trying to fly model ornithopters. Fred Weitzel, of The Bronx, New York, having made a new indoor record of 4:30 at Lakehurst, June 11th, appears to be the undisputed 'king of the birds'. Not satisfied with that, he went on to establish a new autogiro record of 8:27.

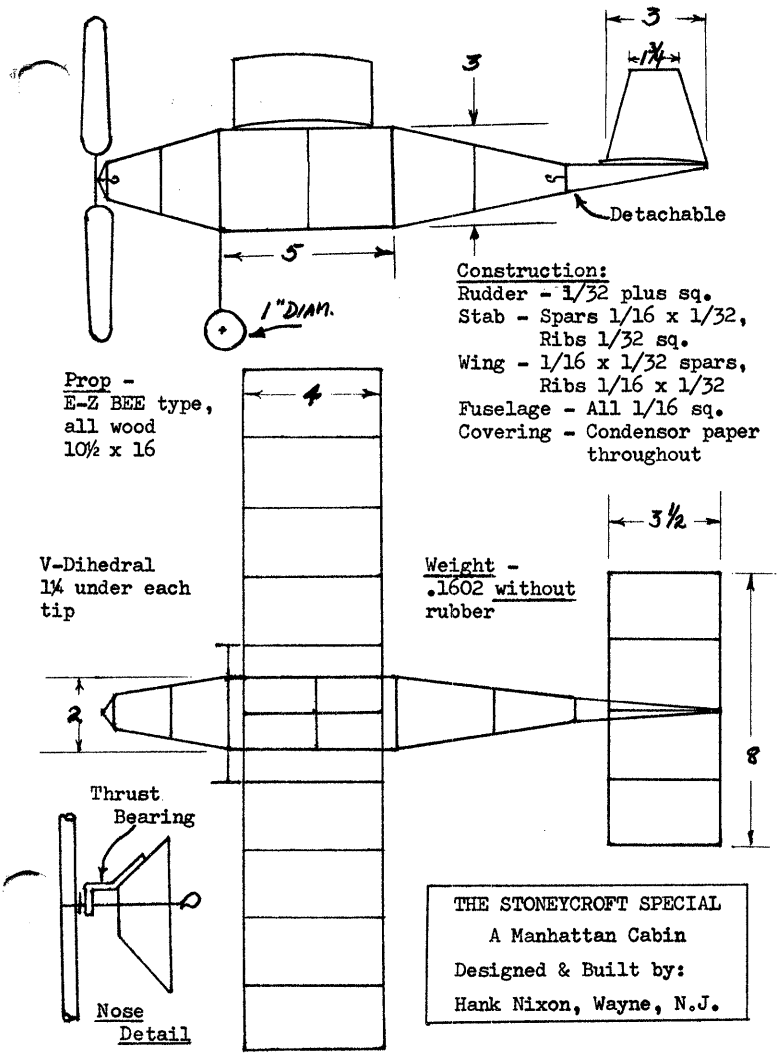
Ornithopters were flapping successfully back in the late 1920's, however, and probably the most outstanding experimenter of that day was Everett Meeks of Washington, D.C. Meeks made the first Washington indoor helicopter record of 0:24 in 1929 and upped this to 1:49 in 1930.



Presented here is his 1930 ornithopter, as illustrated in C. H. Claudy's 1931 book, PRIZE WINNERS' BOOK OF MODEL AIRPLANES.. It was a good flier, but its record flight time is not mentioned in the book.

The AMA had to start at the beginning again, however, and its first Senior Record.....established in December of 1936.....was for the magnificent flight time of :04.6 seconds.....or will you settle for 'drop' instead of 'flight'?

Fred Weitzel has come a long way.



THE STONEYCROFT SPECIAL
A Manhattan Cabin
Designed & Built by:
Hank Nixon, Wayne, N.J.

MANHATTAN CABIN COMMENT

Whenever a Manhattan is flown attention is attracted from both the flying scale advocates and from the FAI Microfilm fans. At Lakehurst on June 11th, where Whitten made a new mark of 3:40.8 with his heavy version, The Riversider, Bill Bigge suggested that the minimum weight requirement should follow indoor practice and be based on airframe alone..... EXcluding rubber. Present rules, of course, call for a minimum weight of .300 INcluding rubber. Bill suggested that this be changed to .200 Excluding rubber.

We have had this suggestion before from other modelers; and it does make sense. One of the most important ways to adjust a model is to change size and length of motor, and to have to worry about whether or not the total weight is still above the minimum is not practical. Especially difficult is the problem of adjusting a Manhattan for a low ceiling after having flown it in a high; here the main way to adapt would be to reduce the size and weight of rubber.

.200 sounds about right for the minimum weight of airframe alone.

* * * *

Featured at the left is Hank Nixon's brand new Manhattan, the Stoneycroft Special; its airframe weighing a mere .1602 oz. So far, only basement flying has been done; but this has been promising, and 5 minutes should be no problem. Hank's design follows rather closely the original layout for a Manhattan that appeared in the November 1965 isuue of I.N.A.V. and later in MODEL AIRPLANE NEWS.

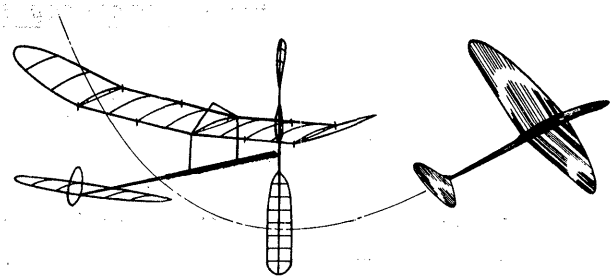
Hank used light outdoor wood in construction. He feels that, if rules required 1/16 square construction and paper covering, the beginner would be less likely to have trouble while the pro could still try a few tricks.

* * * *

It should be noted that AMA Headquarters have the Manhattan under consideration as a possible record and contest category. Howard Johnson made the original proposal shortly before leaving office. Bill Winter of AMERICAN MODELER has also found this model of interest, and will feature in an upcoming issue (possibly September) an article and drawings of Whitten's Riversider and Wall Street Special.

The Voice of N.I.M.A.S. AUG·1967

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

INDOOR HLG

Junior

1.	Michael Charles	1:47.8
2.	Marty Thompson	1:46.2
3.	Dan Wakerly	1:42.0
*4.	William Gibbs	1:39.0
5.	D. Dock	1:38.8
6.	Kan Hamlyn	1:36.8
7.	K. Fayette	1:21.6
8.	Robert Baum	1:17.6
9.	Billy Booth	1:11.8
10.	Eric Averkieff	1:08.2

Senior

1.	Arthur Markiewicz	2:20.2
2.	Tim Batiuk	2:09.2
*3.	M. Smith	2:04.4
4.	Mike Richardson	1:52.4
5.	Steve Houlihan	1:43.0
6.	D. Matsuda	1:27.4
7.	Jerry Combs	1:04.8
8.	Ray Belcher	1:02.4
9.	Bob DeShields	1:01.2
10.	Kit Taft	0:59.9

Open

1.	Lee Hines	2:33.8
2.	L. A. Miller	2:31.0
3.	Larry Cailliau	2:22.2
4.	Keith Varnau	2:19.4
5.	Ron Wittman	2:12.6
6.	Reid Simpson	2:09.6
*7.	Vic Cunnyngham	2:08.0
8.	Robert Patchin	2:07.8
9.	Tom Hutchison	2:04.0
10.	Joe Serviates	2:03.0

INDOOR CABIN

Junior

1.	William Gibbs	11:56.0
*2.	Barry Paillet	2:26.6
3.	Bruce Paillet	2:21.4
4.	Gerry Geraghty	1:33.8

Senior

1.	David Erbach	16:54.4
*2.	Jan Serviates	9:31.0
3.	Mike Richardson	0:24.0

Open

1.	Manuel Andrade	23:42.8
2.	Lew Gitlow	22:59.0
*3.	Joe Bilgri	21:21.6
4.	Charlie Sotich	21:09.0
5.	Joe Serviates	20:03.2
6.	Jim Vale	19:02.0
7.	Merwin Bristol	17:25.0
8.	Jim Richmond	14:14.6
9.	Walter Erbach	13:05.0
10.	Bill Waterman	4:53

INDOOR PAPER STICK

Junior

1.	Willaim Gibbs	9:46.8
*2.	Gerry Geraghty	7:44.0
3.	Barry Paillet	5:52.0
4.	Bruce Paillet	5:17.0
5.	Kenny Happersett	3:48.0
6.	Kan Hamlyn	2:24.0
7.	Kenneth Meyer	0:17.8

Senior

1.	David Erbach	11:25.3
*2.	Jan Serviates	9:25.0
3.	Bill Hunter	9:23.0
4.	Mike Richardson	7:05.0
5.	Jerry Combs	1:34.0

Open

1.	Bob Randolph	23:35.0
2.	Jerry Powell	22:37.0
3.	Lew Gitlow	21:32.2
*4.	Hal Cover	19:02.2
5.	Joe Bilgri	18:28.8
6.	Merwin Bristol	17:52.7
7.	Jim Richmond	17:36.0
8.	Jim Kagawa	17:11.5
9.	Bill Waterman	16:25.0
10.	Ned Smith	16:15.0

INDOOR STICK

Junior

1.	K. Happersett	21:50.0
*2.	William Gibbs	14:26.0
3.	Kristi Tenny	13:24.0
4.	Gerry Geraghty	7:22.0

Senior

1.	David Erbach	23:10.2
*2.	Bob DeShields	18:41.6
3.	Jan Serviates	17:53.0
4.	Steve Houlihan	13:30.2
5.	Jerry Combs	11:42.0

Open

1.	Joe Bilgri	33:38.2
2.	Carl Rambo	31:13.8
3.	Bud Romak	29:13.0
*4.	Jim Richmond	28:52.0
5.	Walter Erbach	26:50.0
6.	Manny Andrade	24:36.0
7.	Charlie Sotich	23:33.0
8.	Bob Randolph	23:02.0
9.	Bud Tenny	20:47.6
10.	Hal Cover	19:02.0

*Trophies awarded only to places underlined.

****THE '67 INDOOR NATS****

The 1967 Nats had a low entry in most events, including the indoor rubber events. Low entry is always hard to pinpoint, but five well-known indoor fliers were serving in official capacity and many other noted West Coast fliers either failed to enter or made no official flights. It is easy to assume that the lack of activity at the Santa Ana hangar (one door had been open part-way for a long time; was closed for the Nats) had considerable effect upon the entry.

There was a new look in trophy line-up this year, with indoor events offering exactly half as many trophies as in previous years. Many indoor events offered only two trophies (see results listing), which seems out of character for the Nats. This inequality came about under a rules loop-hole which requires that Class AAA meets award prizes to third and makes no specification for Class AAAA meet awards. Even lowly Class A meets usually have some form of recognition for third place!

Flying conditions were not terribly good most of the day for the rubber events. A persistent jet-stream ran the length of the hangar, with many official rubber flights ding in the HLG area. Turbulence was apparent at more an one place near the west wall, and a strong drift at catwalk level bothered many flights. Consequently, times ranged far below previcus Santa Ana meets, and even lagged behind the Lakehurst times of 1965.

It is interesting to note that although Bilgri won Stick with a "300" and Rambo's second place was with a 90 cm. FAI, the new 65 cm. FAI was "in the money" with Bud Romak and Jim Richmond flying the smaller models.

HLG times did not approach the record times, but it was a hard contest all the way. Winner Lee Hines, who was kidded a bit about his recent slot car activity, gave credit to the other fliers for a good battle. The Sweepette glider, designed by Lee Hines, nearly swept the HLG event as usual. Many other winning gliders were quite similar to the Sweepette, so this design remains almost unchallenged in Cat. III circles. A notable exception is "Tara 18" (Nov. '64 INAV) by Ron Wittman. Ron is usually right on the heels of Lee Hines, but he injured his arm several weeks before the Nats. His fifth place seems excellent under the circumstances. If I have my facts straight, Mark Smith (3rd, Sr. HLG) also flew the Tara 18 glider under Ron's guidance.

Overheard at the Nats - Observer: Whose paper model is that? Modeler: That isn't paper, it's microfilm; it's just dusty! Keith Varnau and a friend observed carefully where Keith's glider went into the rafters and devised a wondrous attachment for the balloon to retrieve it. Much later, with careful balloon handling, they were successful. As they picked it up, they discovered it was the wrong glider! Meanwhile, Navy men had been climbing up in the rafters retrieving gliders, but one remained unclaimed all day. At last, someone recognized it as the one Jim Scarborough lost at the '63 Nats!

Indoor Scale was sponsored "on the side" by the N.A.A. Flightmasters, and flown in the 45' ceiling Boy's Gym at Long Beach City College. Bill Hannan, who has been very active in producing indoor scale plans, reports on the Indoor Scale event:

(cont. on p. 3 col. 2)

****1967 INDOOR TEAM SELECTION FINALS****

1.	Jim Richmond	24:57	30:58	33:47	17:53	27:06	27:19	64:45*
2.	Al Rohrbaugh	22:40	16:12	23:33	10:47	0	29:39	53:12*
3.	Clarence Mather	24:57	27:10	5:38	9:27	25:01	15:35	52:11*
4.	Bud Romak	19:38	24:32	25:44	23:24	10:00	8:14	50:16**
5.	Ernie Kopecky	2:46	0:26	24:06	9:00	4:10	26:07	50:13
6.	Erwin Rodemsky	7:42	6:35	24:19	3:09	22:49	25:16	49:35
7.	Joe Bilgri	21:43	10:49	26:26	20:10	0:18	7:48	48:09
8.	Ron Ganser	10:24	20:22	2:07	19:59	23:46	4:08	44:06
9.	Joe Hindes	6:49	17:06	14:52	26:23	0:08	5:40	43:29
10.	Bob Champine	9:35	6:46	19:07	5:19	20:53	8:03	40:00
11.	Carl Rambo	6:24	16:01	16:38	23:01	7:42	0	39:39
12.	Jim Clem	0:19	20:07	18:36	0:20	3:28	0:32	38:43
13.	Stan Chilton	0:14	0:49	5:20	0:20	11:09	16:59	28:08
14.	Dick Ganslen	9:29	9:53	9:15	2:05	6:22	12:37	22:3

*Team Member
**Alternate

The Indoor Team Selection Finals were held in West Baden, Indiana, amid a scene described thus by one contestant: "The buildings and grounds seemed like part of a European landscape. It was an enjoyable experience just to stay there. There were some problems with drafts and obstructions, but they were about par for indoor meets - I've flown in only a few better and a great many worse sites."

A spectator/helper's post card read: "Site tricky, drafty, sunny, full of thermals. Altitude control impossible at times."

Another contestant said: "If you awoke late and looked out your window, you would see models flying past! With the rooms surrounding the flying site and the chow hall on the premises, you didn't have to leave the building unless you wanted to!"

All the contestants had high praise for CD Chuck Borneman and his helpers: Ed & Jan Capogreco, Paul & Nancy Tryon, Wayne Zink, Jack Niederhouser and John Adams. One comment sums it up: "Things went smoothly due to excellent organization and knowledgeable help."

The site owners (Northwood Institute) came in for high praise also. Every courtesy was extended to the group, accomodations were excellent and convenient, good food and plenty of it was served, and the cost of it all was quite low. To cap it off, complimentary tickets to a school theatrical production were made available to the group.

Steering was an important tactic, and finesse at retrieving hung models was a necessity due to the turbulence and thermals from the skylights. At first glance, this type of inconvenience could be considered a poor situation for a Finals. On second thought, all reports from European contests (except the Rumanian salt mines) show similar problems. We can now rest assured that the team members can cope with less than perfect conditions and thereby make a stronger team.

Advance information on the ceiling height of the site was somewhat optimistic - FAI-type measurement yielded 94'. The 208' diameter was reduced slightly by window balconies with flower-boxes and ferns at the 4th and 6th floor levels. Also, potted palms around the perimeter gave rise to another first - indoor models landing in a tree! The final obstacle was a retractable bandstand which pulled up to the 94' level, but had an inverted "mushroom" stand 8' below which caught many models.

Perhaps the most distinctive model design was by Jim Clem, with squared off wing tips, curved center dihedral and a racy trailing fin. Richmond's winning model had some small changes from the plan in July '67 INAV, with the fin moved ahead of the stab to bring the CG forward to 75% for better control in the turbulence. Unusual props: 19 x 36 by Rohrbaugh; 16 x 32 with 3" wide blades by Rodemsky, and very high aspect ratio blades used by Mather.

Clarence Mather scored high in Round I, only to be tied in the next flight by Richmond. Bilgri, Rohrbaugh and Romak followed closely behind with conservative flights. The second round, after lunch, saw several fliers overcome 1st round bad starts, while Richmond and Mather come on stronger to 1st and 2nd respectively; Romak moved into 3rd and Rohrbaugh into 4th. At the end of the first day, the Round III results had not changed these standings, but all four leaders had made substantial improvements in their totals. Day I standings: Richmond, Mather, Romak, Rohrbaugh, Clem, Rambo.

Highlights of the day: Richmond's two good flights climbed to the conservative altitude of 70'-75'; Romak's two peaked slightly lower. In Round III, Ron Ganser led off with a beautiful fast climb which abruptly stopped as the rubber jammed the prop. Ron made a frantic try to free the prop with the balloon string, but was too late. He finished the attempt flat on the floor with the model at 2' altitude! He didn't make it, but this surely is a record for low altitude steering attempts!

The only recorded collisions happened on Day II during sunny conditions which were more turbulent than those of the overcast Day I. One collision came in Round IV between models belonging to Bilgri and Ganser. Both fliers elected to take another attempt; Ganser lost 17 seconds on his second flight while Bilgri gained 39 seconds. The second collision came when Rohrbaugh's 6th flight (last flight of the meet) dislodged Ganser's hung model which resumed a beautiful flight "in orbit" with Rohrbaugh's model. The inevitable happened and Al chose to stick with the flight. It had already been a cliff-hanger of a flight - a climb to the roof, a 20' tail slide and return to the roof before dislodging Ganser's model. Even then it flirted with the usually fatal "mushroom" before settling into a cruise. This flight, which drew a big cheer upon landing, upset the top placing which had held from Round II. Rohrbaugh took second place, Mather moved to 3rd and Romak to 4th. It was all over but the final bull sessions.

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

WILLIAM E. GIBBS, 5005 Halifax Circle, Cypress, Calif.
LESTER H. PAETZ, 3737 Cabrillo Ave., San Pedro, Calif.
KEITH VARNAU, 2191 E. 21st St. Apt. A, Long Beach, Cal. 90806

Family Memberships

BOBBY HANFORD, 3838 S. 88th E. Ave., Tulsa, Okla. 74145

SPECIAL ANNOUNCEMENT

There will be a flying session (maybe a contest) at Lakehurst Sept. 3-4, 1967. Presumably this will be in Hangar #6 (Cat. III AMA, Cat. IV FAI), but it may be in Hangar #2 (Cat. III AMA, Cat. III FAI).

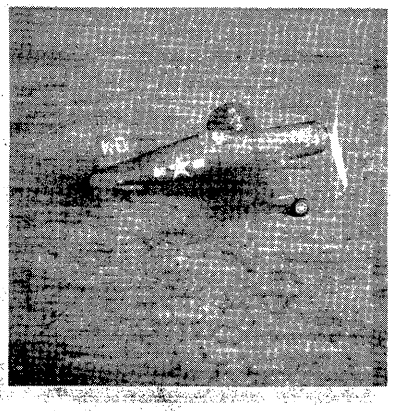
THE PICTURE STORY

Page 3 - Indoor Nats

Pictures by Bill Hannan and Jody Tenny

Top Row
Left - George Honda winds Jim Kagawa' Paper Stick
Center - Jim Richmond and 4th place Indoor Stick model
Right - F4U Scale entry by Fulton Hungerford

(cont. on p. 3 col. 1)



Center Row
Left - Bill Bigge and small friend.
Center - Harold Warner and Open Biplane winner
Right - Corben Super Ace by William Harris (3rd monoplane)

Bottom Row
Left - Charlie Sotich demonstrates direct reading prop pitch checker
Center - Carl Rambo with 2nd place Indoor Stick model
Right - Jim Vale prepares Cabin flight as contingent of Mexican RC fliers watch.

Page 4 - Team Selection Finals

Left Column (top to bottom)
1. Clarence Mather
2. Bud Romak
3. Joe Bilgri

Pictures by Borneman and Jim Richmond

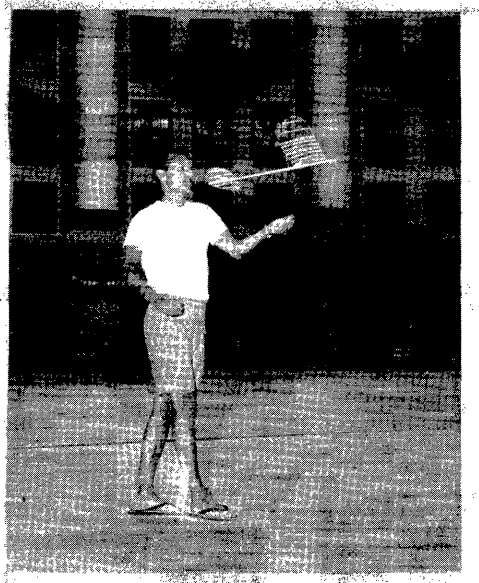
Center Column (top to bottom)
1. Al Rohrbaugh
2. Ronnie Ganser winds Ron Ganser
3. Bud Romak checks span while Chuck Borneman watches
4. Hal Crane with experimental biplane - not entered!

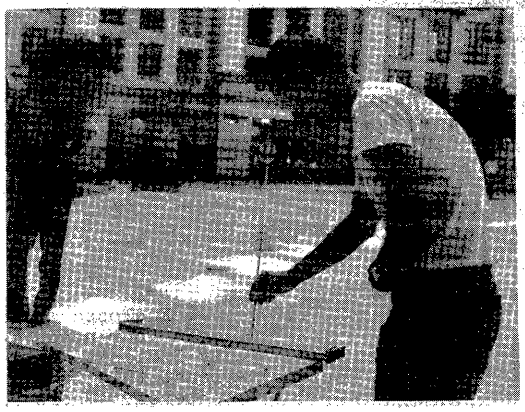
Right Column (top to bottom)
1. The team - Mather, Rohrbaugh, Richmond
2. Dick Ganslen
3. Richmond's winning model
4. Al Rohrbaugh rescues wayward model

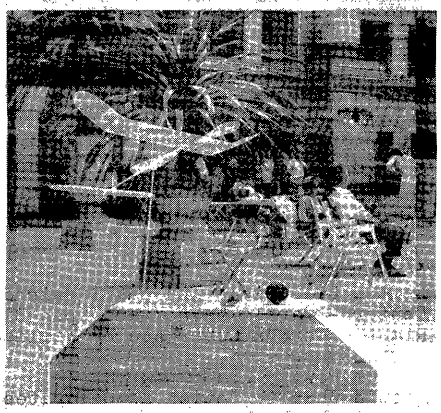
Enclosed are a couple of snapshots, which I hope will meet your needs for the indoor scale report. Unfortunately I didn't get shots of all the winners, but I think at least this is a representative indication of the many types entered. There were 52 entries, including pre-WWI types, inter-war machines, WWII fighters, racing aircraft and post-war light planes. Although the winning entry (Fernando Ramos' 1911 Cessna) turned in flights of over a minute, most of the models averaged somewhere in the 25 to 40 second range. Many of the spectators expressed strong interest in the event and promised to try to find suitable flying sites in theur home towns.

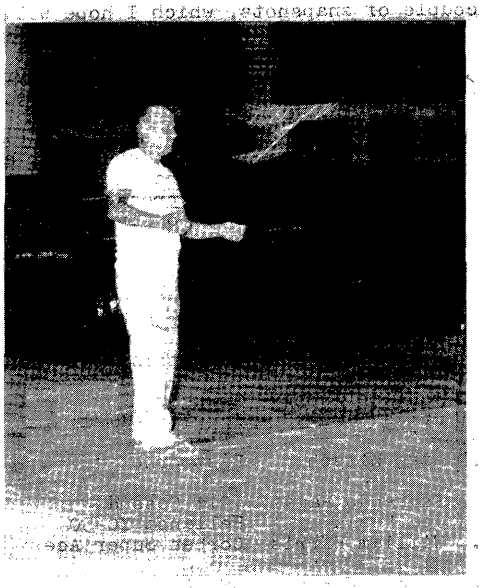
Indoor Scale results:

Junior Monoplane:	1.	Dennis Lutz	Fokker D VII
	2.	Russ Kohler	Cessna 180
	3.	Mark Osborne	Shoestring
Junior Biplane	1.	Douglas Mooney	Aero 101
	2.	James Warner	Sopwith Camel
Senior Monoplane	1.	Mike Mitsch	Eastborne
Open Monoplane	1.	Fernando Ramas	1911 Cessna
	2.	Jed Kusik	Bellanca YO-50
	3.	William Harris	Corben Super Ace
Open Biplane	1.	Harold Warner	SE 5A
	2.	Joe Bailey	Bristol Scout
	3.	Jed Jusik	Nieuport



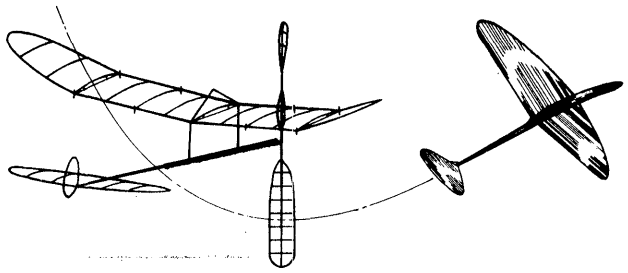






The Voice of N.I.M.A.S. SEP·1967

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

CARL RAMBO, 262 Albatross Ave., Livermore, Cal. 94550
JOHN E. REGER, Jr., 37 Cragg Road, Rochester, N. Y. 14616

Dick Black Memorials

Dick Black spent a large part of his energy helping people become acquainted with model airplanes, or if they were already building models, he helped them find out how to build them better. It seems quite fitting for the NIMAS Dick Black Memorials to be an information service carried on in Dick's name, and this is what is now being planned.

The actual form of the Memorials will be audio-visual training aids, to be available to clubs and individuals for a nominal fee. It is expected that these training aids will make full use of slides, 8 mm. movies and tape recorded lectures in whatever combination seems to be the most effective. Anyone who would like to participate in preparation and planning on this project is most welcome, and extra hands will certainly speed the project. So, if you would like to help, drop a line to Bud Tenny, Box 545, Richardson, Texas 75080 and volunteer.

Help Wanted!

In correspondence with several fliers who mix their own microfilm, I have found out that film which is both non-sticky and free from static effects is a rare bird. Most of you know that I have spent much time in developing (trying, anyway!) better microfilm. If anyone has a film formula which is not static prone or sticky (either one or both) and would share their formula, it will be most welcome information. I am making some progress, and a status report will be coming in a future issue along with the promised recap of the microfilm series of a while back. A possibly important addition to my test procedure will be a temperature controlled "hot box" to test film for resistance to elevated temperatures. Present tests have already included test panels covered with aged film to be stored so that long term stability can be proven.

Nats Trophies - An Editorial

In Item 6 of the September mailing to AMA Officers and Chartered Clubs, AMA HQ acknowledged that some people felt Juniors had been slighted at the 1967 Nats if they won 3rd place in a low entry event and received no trophy. It was further stated that greater numbers of Juniors are needed at the Nats to encourage "continued Navy interest." Their "solution" was to announce that Juniors who had entered the Nats would receive a certificate, and those who placed through fifth place would receive a "special version of the certificate."

The certificates were created, signed by AMA President Cliff Weirick, and each was then stuffed into a large size envelope with no cardboard to protect it. There was no legend on the outside ("DO NOT FOLD") to protect it either. In 6½ years of INAV, I have seen less than 10% of the art work and special papers sent to me arrive unfolded and in good condition if they were not heavily protected. Junior Nats winners may be able to flatten their certificates so they will frame nicely, but they were printed on card stock which creases and wrinkles at the crease - very unsightly.

It is true enough that the AMA Rule Book does not specify that Class AAAA meets must have trophies through third place. However, this is specified for Class AAA meets; it is questionable taste to give fewer trophies at the Nats and this practice certainly violates the intent of the rule. AMA cannot even claim to have saved money by this sad practice - trophies were awarded to 18th place in some events - Open events!

FAI INDOOR REPORT

Team Members Confirm

The top winners of the Team Selection Finals (Jim Richmond, Al Rohrbaugh and Clarence Mather) have all confirmed their intent to compete in the 1968 Indoor World Championships. It is almost certain that Bud Romak will be the Team Manager, and this completes what is sure to be a very strong team.

International Meet

The Italian Aero Club and the Aero Club of Rome are jointly sponsoring an international indoor contest on Oct. 7-8, 1967. It is to be held in the Palazzo dello Sport, proposed site for the 1968 Indoor World Championships, and will be a "proving ground" for both the site and the sponsors. If all goes well, final approval will be given for the W/Ch to be held in this site.

The Coppa Urbe 1967, as this contest is called, will be the eighth national and international indoor meet to be held in Europe this year, with Austria also planning an indoor meet in October. Italy is having a national meet Sept. 17 in Pistoia, and other meets have been held in Hungary, Romania, Czechoslovakia, Finland and Germany. It is heartening to see so much activity, but these same contests are a potent training ground for European teams who will be flying in the 1968 W/Ch. I hope to be able to present a summary of this activity in the October issue, and the great potential of these teams will be apparent.

A LOOK AT YESTERYEAR

How would you like to be able to buy a kit which has plans for seven of the best indoor models of the year? It has enough wood and other material to build any one of the models, and it only costs $1.25.

The above was a glimpse into the pages of American Boy Magazine, December, 1930. The story was headlined "Build a Twelve-Minute Plane!" and gave details of three of the models. Fliers of these top three models were: Raymond Thompson (11:47), Carl Goldberg (11:23) and Fay Stroud (11:04). A study of the plans and text showed features common to the three models: built-up fuselage, carved prop and tissue covering (microfilm would appear in regular use about 14 months later). Thompson and Stroud had rolled, non-tapered tail booms, while Goldberg used a solid boom. Thompson and Stroud used square built-up motor sticks and Goldberg's had a rolled tear-drop cross-section. Thompson used round wing spars, Goldberg's were square, and Stroud used hollow rolled spars 1/16" in diameter. One could go on - let it suffice to say that this was the era of new ideas and rapid development - no avenue to increased performance was overlooked.

The extremely close times (made at the 1930 Nats) showed how hard fought indoor meets were even then. Ray Thompson gave full credit to his opponents by saying, "If Stroud had had more slack in his motor so he could have given it a few more winds, or if Goldberg had had his best prop, I probably wouldn't have had a trip to Europe!" (Goldberg's best prop was ruined when a sleepy friend dozed off and fell on it.)

We are indebted to Ed Beshar for the above info, and he sheepishly admits he was the sleepy prop-smasher!

STATE OF THE ART

Clarence Mather's third place winner (team selection Finals) is the model for this month. He says this of the model: "Since I had limited time (Clarence completed his Master's degree in Physics this year) to build and fly, I figured it would be best to stick to something fairly standard and build on the heavy side. The model is much like the 90 cm. jobs I flew two years ago. Two were built and tested in our 24' site - then flown in the Cow Palace and West Baden. I want to try higher pitch props since the models climbed too much on the rubber they were stressed for - particularly at West Baden where the air temperature was high.

DACRON BRACING

Ever since March, 1964, when dacron samples were first made available for bracing flight surfaces, people have been receiving dacron monofilament for the asking. Many fliers have replenished their supply after the first batch was used up, and several reported disappointing results.

With this in mind, it is now time to review the resulting opinions of dacron monofilament as a bracing material. In general, most people swear by dacron once they have used it; I have no intention to use anything else. On the other hand, some people tried it and only swear at it! No one seems to strike a middle ground, so each flier has to try it for himself.

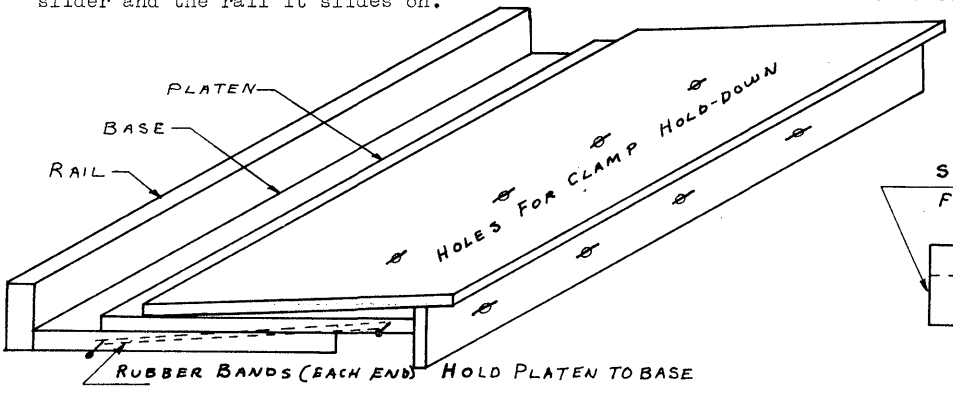
Three specific objections have arisen. First, one flier braced a wing which warped as soon as it was removed from the jig. Since that time, I have been careful to caution that dacron has a delayed strain recovery. This must be taken into account, since a strand which is pulled too hard (stretched) during separation from the bundle may well warp the wing when it does recover. If you separate the strands carefully, and well in advance of using them, strain recovery should not cause a problem. A second objection was raised by Jim Richmond, when a wing arrived at a meet with the bracing slackened too much to use. I have had this happen with both dacron and wire, and I believe I traced it to having braced the wings in high humidity and attempting to fly in low humidity. Although wire is usually kinked enough at bracing points to prevent proper re-bracing with the same wire, dacron never kinks. If you happen to brace a wing in dry air and fly in damp weather, dacron may stretch enough to prevent a warp and wire won't.

This ability of dacron to stretch under load caused problems for Manfred Koller last year. With 90 cm models in a car-top carrier on his Volkswagen, wingtips would "bounce" on rough roads. The microfilm would fold over as it slackened, and pull holes in the wing. I have been lucky in this respect, since my car-top carrier has over 12,000 miles on it, and one wing built in 1964 has 8,000+ miles on it with no damage not caused by clumsiness. It is covered with dry film, so I have no way to know if the wing deflects from road bumps or not.

There is plenty of dacron still available, so if you want to try some or want to replenish a failing supply, send a stamped, self addressed envelope with your request.

BALSA STRIPPER

The May '64 INAV featured a balsa stripper by Bill Atwood which used micrometer heads to position the straight edge with excellent accuracy. The one shown below, designed by Hewitt Phillips, is also capable of good accuracy. It sacrifices the micrometer readout for the important feature of using materials likely to be on hand in most modeler's workshops. Bob Champine built one, and suggests that a metal insert be used as bearing surface for the adjustment screws. Use care in constructing this stripper and it will give excellent results; the most important item in the construction is the fit between the slider and the rail it slides on.



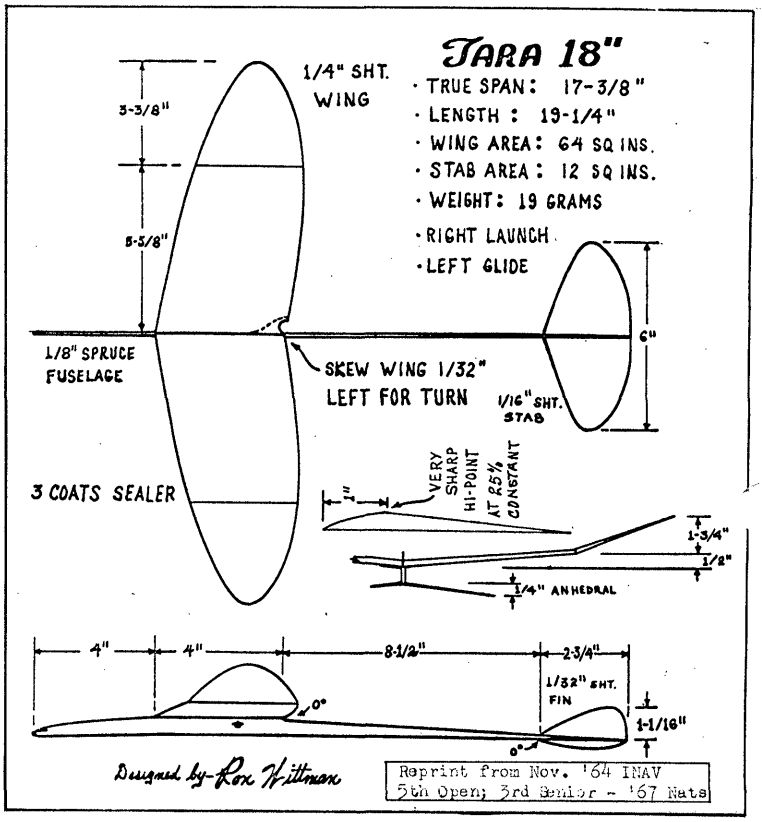
INDOOR RULES

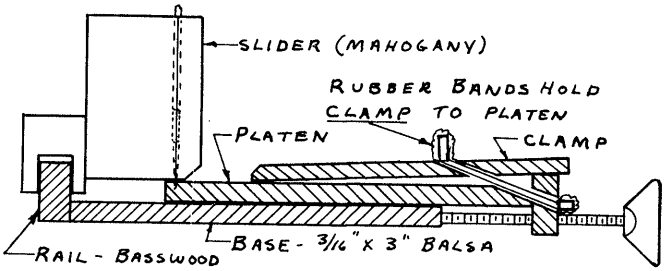
Several items of indoor business were discussed by the FFCB at the first Nats meeting. These items were outlined in the July '67 INAV; the special circumstances of a face-to-face meeting permitted special handling of one of these proposals. FF67-B-1, a proposal to clarify Sec. 8.12 of the Rule Book, was dropped in favor of formally adopting a interpretation of the 1966 FFCB. The interpretation came as a result of a protest on an autogyro flight, and reads: Wing area of an indoor autogyro must not exceed rotor area. Stabilizer area in excess of 50% of the total wing and rotor area must count as wing area.

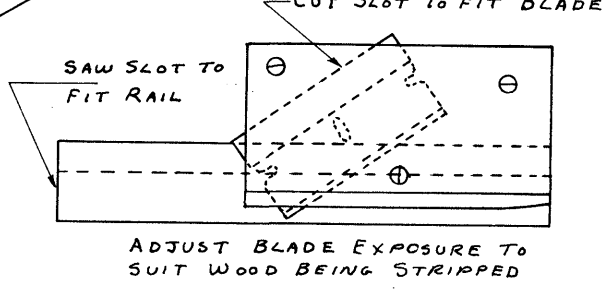
RECORDS? MAYBE!

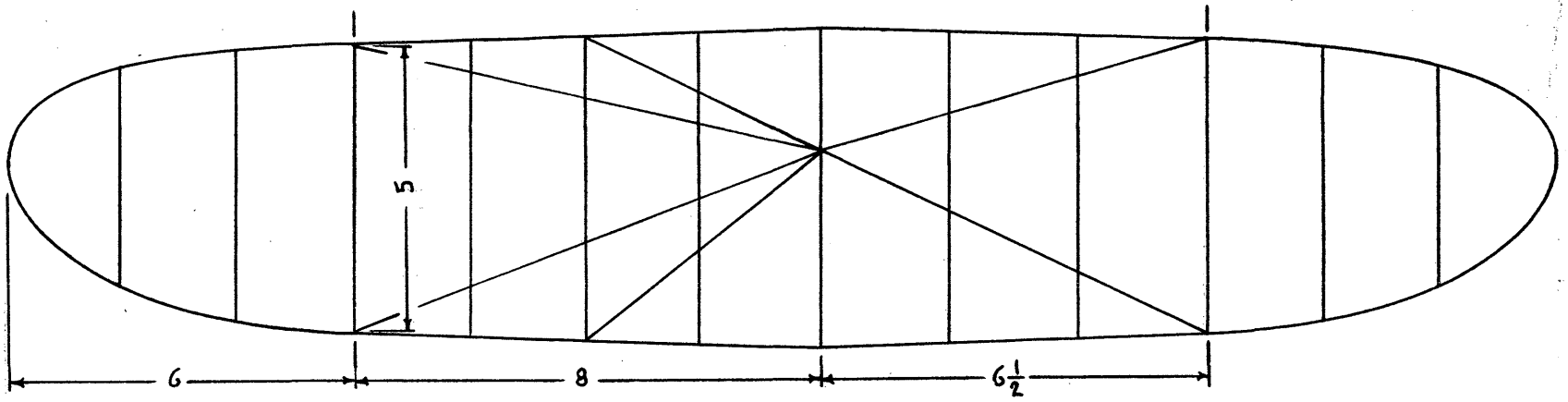
Recent issues of this column gave rise to several possible records for Jim Richmond's FAI model. AMA HQ is no longer issuing two records for a single flight, so Jim has been awarded two certificates for recent flights:

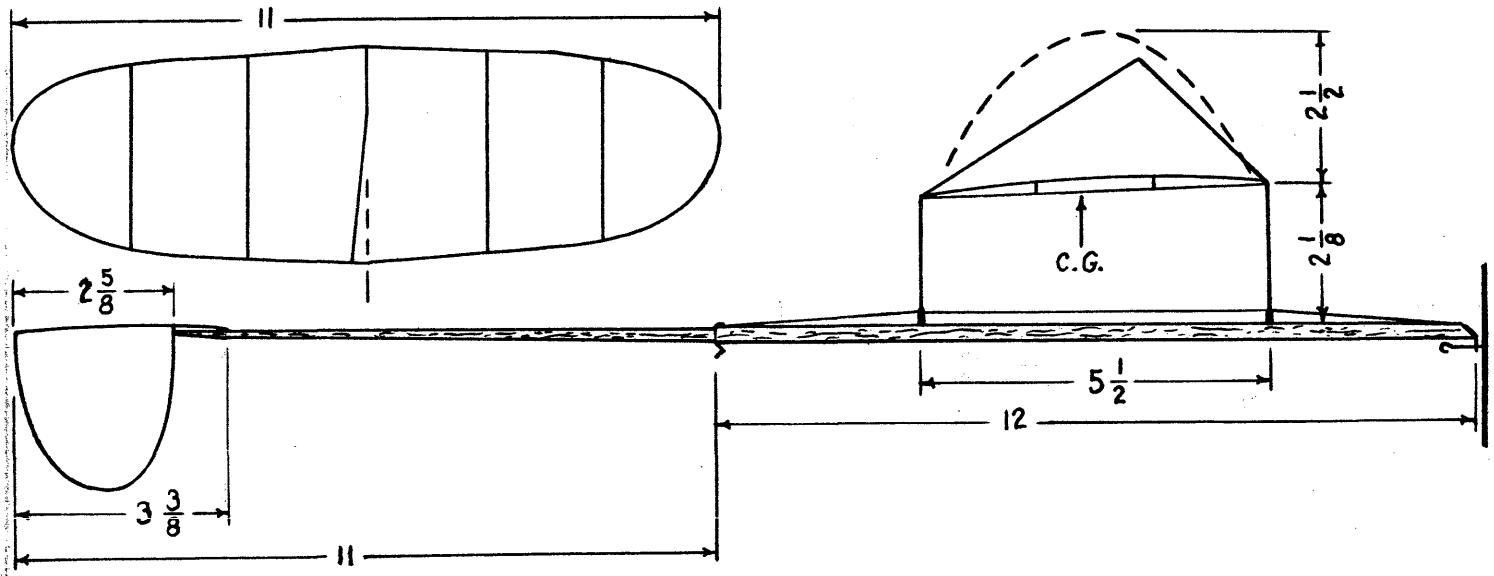
AMA Cat. II C Stick - 29:21.5
FAI Cat. III FAI - 33:47





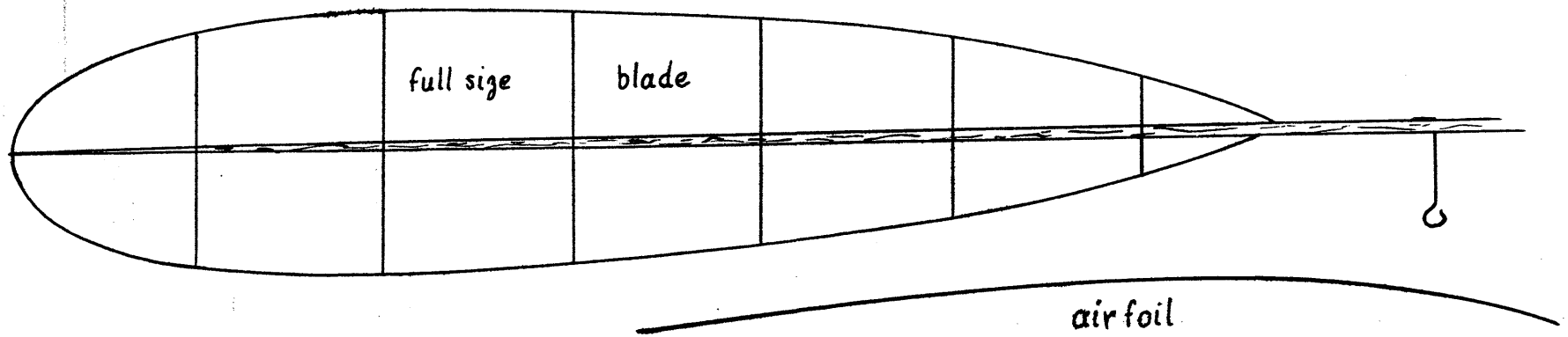


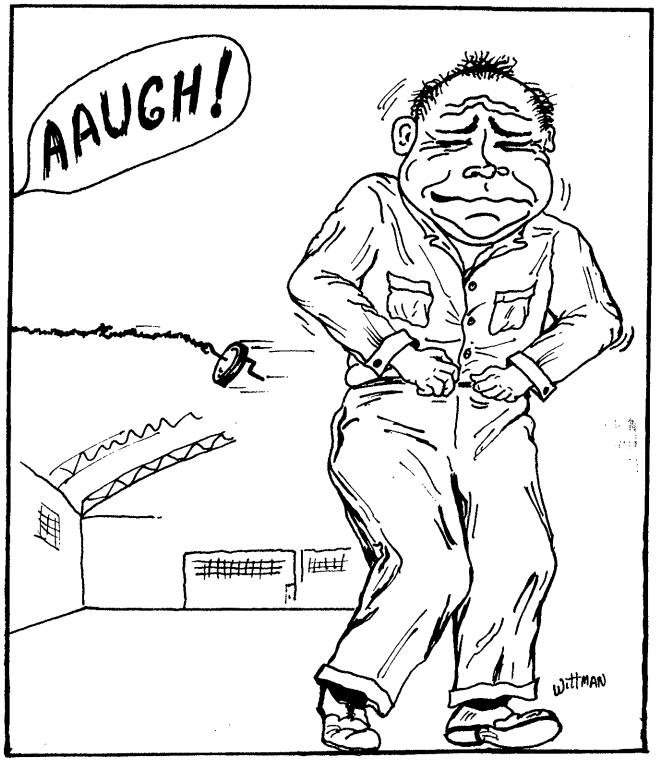




65 cm FAI 1/3 SCALE
wing area 120in²
stab area 32in²
weight .026 oz
power .042" - .048"
prop 17"/30"

C Mather





THE TRAINING OF A CHAMPION

(cont. from June)

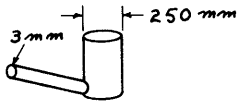
Berlin 3/19/66

Dear Hans!

I will use this Sunday evening to answer you on all the questions you had. The best solution of mikrofilm consists of dope called Clou made by Clouth. To this add 5-10% Amylacetat and approximately 3% Eukalyptus-oil. The addition of the two latter substances depends upon the quality of the Clou which varies even within one production output.

In respect of the Amylacetat it is simple: if there are big wrinkles in the film when poured on the water, you must use more Amylacetat in the solution. Eukalyptus-oil should be used as little as possible because this ingredient causes pulling of the film. But if you use too less, the film is so brittle that you cannot lift it from the water. You must try a little till you find the best solution. Hacklinger uses instead of Eukalyptus-oil, Benzyl-Butyl-Phthalat as softener. But I did not succeed, to find a usable mixture with this softener.

For pouring the solution on the water, I made a tiny can with the following dimensions:

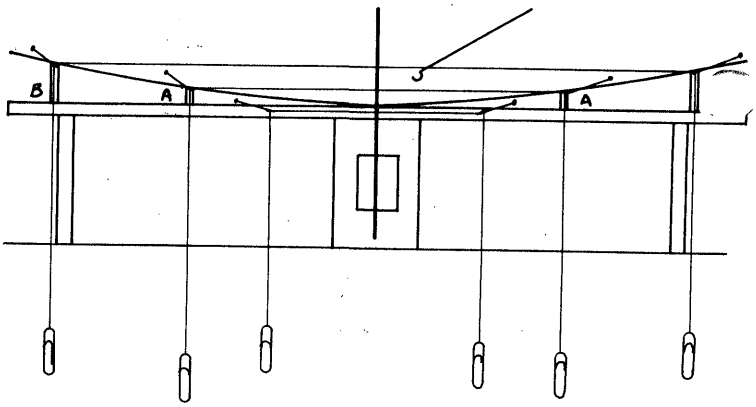


As a water-container I am using a big table with a frame of wood on it and covered with plastic sheet. The water should be 3 cm deep. The water and room temperature should be equal and low to cold. Before pouring you should draw a sheet of newspaper over the water to remove dust.

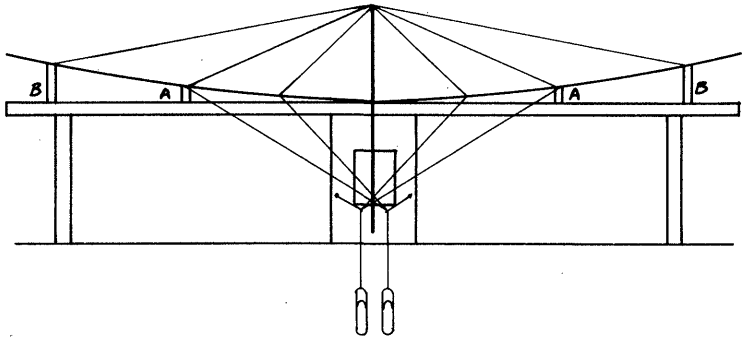
From the mikrofilm frames I cover other frames which are big enough to cover the wing, the stab and the rudder. The success of pouring varies from day to day, so it is the best to have lots of frames if all is running well. This using of special frames for covering the wings, has the big advantage, that one can push them together at the middle so the film can follow the hollowed profile. The covering itself is like described by Joe Bilgri in his MAN articles. I think you know it.

The wings are covered, lying flat on the work table, with films 1-2 days old. Before bracing, the covered flat wings should rest 2 days more. For covering stabs, the film should be at least 8 days old and before bracing the stab it should rest again 8 to 14 days. For the rudders I am using very old film. For the propeller you can use new film, but the covered props should be fixed on the jig for several days.

It is not very easy to describe the bracing of a wing but I will try to describe it step by step. First you place the wing cautious on the jig, and fix it with small quantities of dope in the middle. Then lift the ears and place under them the jigs named A and B. Then the pylons and the cabanes are glued on. Now you take sufficient long bracing wires and glue on both ends paperclips. The drawing will give you an imagine what I mean:



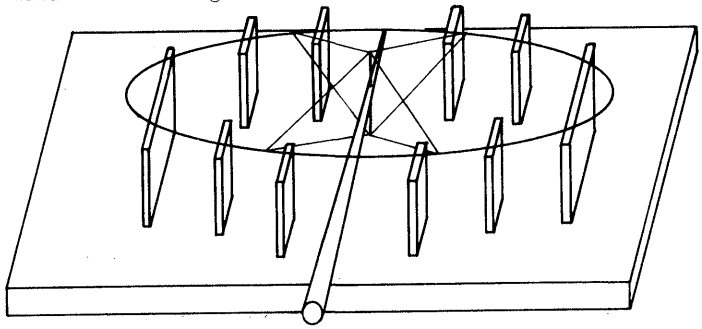
Then you lift the bracing with a hook on the top of the cabane. Then you glue the wires to the leading and trailing edges. After this remove the pins and pin them beside the pylon like this:



If you have finished the front side, make the same at the other side. After this you can remove the jigs A and B, and cut loose the trailing edge and leading edge in the middle. Don't be anxious if the wing has wrinkles, this is normal. After some days they vanish.

It is recommended to cut the pylons somewhat thicker than the diameter of the paper rolls they are put in. Reducing it to the exact diameter is done by pressing it between the fingers. If they are too thin, you can enlarge the diameter by making it wet.

Since the stabilizer is also braced, I constructed a jig as follows. It must be constructed in such a way that the stabilizer has a little dihedral. If you do not observe this and brace the stab flat, you will have a sharp break after the end of the bracing wire. In respect of the airstream caused by the propeller, the stabilizer must have a washout of the right wing. This means that the trailing edge of the right part of the stabilizer has approximately 3 mm more incidence on this part of the stab where the bracing wire is fixed to the stab.



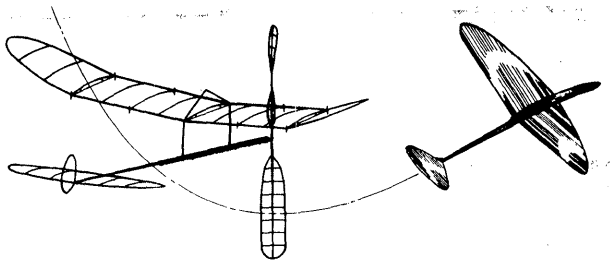
I hope that you can follow this Picasso. Also the bracing of the stab I am making with the paperclips on the ends of the bracing wire.

This is all I can report you. I hope it is enough for the beginning. By this occasion, one can increase the performance of the model by increasing the span of the stab and putting back the CG. But this you should not try before the performance of the original model is sufficient. Another thing: formerly I made the mistake and sanded the spars of the wing elliptical. Since this is the exact contrary of an I-spar, it is utmost disadvantageous and gives besides high weight and less stiffness. So use only square spars for the wing and stab.

Best regards,
Karlheinz

The Voice of N.I.M.A.S. OCT·1967

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

PAT LAUGHTON, 902 S. Victory, Waukegan, Ill. 60085
MARTIN RICHARDSON, 7130 Claybeck Dr., Dayton, O. 45424

FAI Category Records

Recent correspondence has shown some confusion over what to call the various records we can set with our 65 cm models. First, for records normally referred to as FAI Indoor: the proper title is AMA Cat. X FAI. There are 9 records with this title - three for each age class in each AMA ceiling category. The new record class set up this year for FAI models is called FAI Cat. X FAI, with 4 possible records, one in each FAI ceiling category. There are also four World Records, one for each FAI ceiling category. Both FAI Cat. X ("X" refers to category number) FAI records and World Records have only one age class.

Model size is sometimes misunderstood in connection with these records also. AMA Cat. X FAI, FAI Cat. X FAI and FAI national and international competition all must be flown with 65 cm models. World Records may be set with any size indoor model up to 2,325 sq. in. total wing and stabilizer area.

Further distinctions: AMA Cat. X FAI records and FAI Cat. X FAI records are set on an AMA sanction, while World Records are set on a special sanction obtainable from AMA HQ. Special information on procedures associated with this sanction is available from AMA HQ in a memo entitled "FAI World Record Procedures."

Nats Report by Linstrum

Dave Linstrum's VTO column has a very good write-up on the Indoor Nats in the Nov. '67 MAN. He concludes with a reference to a possible site for the 1968 Nats to be held at Olathe NAS. Since then, several things have transpired and there is a possibility of the site being chosen from some other locations. So, Dave asked that his site comments in this column be ignored - they may be outdated!

Spread The Word!

Chris Soenksen, of Mundelein, Illinois, is holding an Indoor Symposium on Oct. 29, 1967. The program location is the Boy's Gym of the Highland Jr. High School at Libertyville, Ill. The school is on Rockland Rd. - turn west off Route 21. The program begins at 2 PM and has Charlie Sotich, Jim Richmond, Bill Graham and Chris as speakers. For further information, contact Chris at 312-566-8450.

The above announcement is one I make with considerable pleasure. Our hobby must now spread mostly by word of mouth, since our allotted space in national magazines must remain in proportion to our level of activity within the total of model airplane activity. It is only by such special efforts on the part of dedicated indoor buffs that we can gain more fliers than we lose to other activities. I salute these fellows for their effort, and suggest that all who can attend, should. It will be a good session!

AMA Election

By the time you receive this issue, all AMA members should have received their ballots. The deadline for return of the ballot is Nov. 15, 1967. Six AMA Districts are electing V.P.'s, and the AMA Sec.-Treas. office will also be filled. Inform yourself about the qualifications of the nominees and vote! Earl Witt is the only candidate who accepted the nomination for Sec.-Treas.; in my opinion Earl is very well qualified for the post. For more information about Earl besides that which accompanied the ballot, see p. 38, Sept '67 American Modeler.

Join NFFS!

The National Free Flight Society is beginning a membership drive, to be announced in the Sept. issue of the NFFS Digest (it may be published before you receive this issue). One major change in NFFS policy is that all new memberships will be on a 12-month basis like NIMAS. NFFS has grown pretty well since its inception, and has begun to provide services for members in the same fashion as NIMAS was able to expand services beyond the newsletter. Let no one who hasn't joined NFFS wail about a real or imagined demise of free flight; those who joined are now helping insure that FF does not die!

Easy B Plans

Any NIMAS member who would like full size plans to go with the Easy B article in the Oct. '67 American Modeler (it is an excellent model to begin teaching youngsters with) can receive one by sending 10¢ in stamps with their request. For clubs or individuals contemplating a large class or group instruction, a sepia tone print (can be used to make blue line prints) is available for 25¢ in stamps. Send request to Bud Tenny, Box 545, Richardson, Texas 75080.

Zaic Yearbooks

Frank Zaic is planning on re-issuing several early Yearbooks and other publications ranging from the 1934 YB to the 1953 YB. Send him a 5¢ stamp and request that he send you a brochure and order blank. You must read the brochure to appreciate the contents of these books - and you must order the books in advance. If insufficient orders for any single book are received, that one will not be re-printed and the money returned. Send your request to: Frank Zaic, Box 135, Northridge, Cal. 91324

FAI INDOOR REPORT

Team Manager Appointed

Bud Romak has been appointed as Team Manager for the 1968 FAI Indoor Team. His first duty (self-appointed) was to attend the International Indoor meet being held in Rome, Italy, on Oct. 7-8, 1967. The outcome of this meet will determine whether this site will be used for the 1968 W/Ch or if another host must be found. If this is the site, Bud's experience will be invaluable to the team.

INDOOR RULES

Final voting is almost complete on FFCB business, and the two proposals covering indoor rules have both passed. FF66-D-2 updates Sec. 4.7 to permit a contestant to either hold his model or wind the motor; it also spells out permission to use winding stooges. FF66-E-2 changes Sec. 10 to permit indoor gliders to have built-up construction. Date of effectivity for these rules is Jan. 1, 1968.

CONTEST CALENDAR

MARYLAND - Indoor sessions; Kennedy High School, Wheaton, Md.; 7-10 PM. Call Tom Vallee, 498-0790, Laurel, Md. for last-minute verification. Dates: Sept. 22, Oct. 27, Nov. 17, Dec. 8.

MISSOURI - Indoor Scale Contest; Assumption High School, Route 50 & 59th St., East St. Louis. Dec. 3, 1967. AMA Rules. Contact Kirkwood Thermaleers.

SPECIAL INTERNATIONAL ISSUE

This issue is dedicated to all my friends and fellow indoor fliers outside the U. S., with special good wishes to those European fliers who have enjoyed such an active season this year.

RECORDS? MAYBE!

World Records

Jim Richmond's winning flight at the Team Selection Finals has been accepted on a tentative basis as a World Record. Just before publication, we received word that Jiri Kalina of Czechoslovakia posted 17:29 in a Cat. I record attempt and that this has also been tentatively accepted. If these two records are approved, the World Record slate will be as follows:

Cat. I	Jiri Kalina	17:29
Cat. II	Jiri Kalina	26:40
Cat. III	Jim Richmond	33:47
Cat. IV	Karlheinz Rieke	45:40

EUROPEAN INDOOR COMPETITIONS

1967 has been a year of unprecedented indoor contest activity in Europe, with at least ten national and international contests scheduled to date. The reports below, dealing with seven of these contests, were submitted by Manfred Koller of Austria, Otto Hints of Rumania, Andras Ree of Hungary, Esko Hamalainen of Finland and Rudolf Cerny of Czechoslovakia. My thanks to these fliers, who have helped to keep me posted on this important activity.

Brno, Czechoslovakia April '67 42 m. Site 18 contestants

1.	Eduard Chlubna	19:55	20:50	40:55
2.	Jiri Kalina	19:45	18:37	38:22
3.	Dagmar Chlubna	14:44	19:07	33:51

This was a national contest, held under cool and humid conditions which weakened motorsticks and warped wings. This site is customarily drafty and turbulent, but it was quite calm for this contest.

Salt Mine in Rumania (located 250 m underground in foothills of Carpathian Mountains) Site 50 m x 100 m with 75 m. ceiling. International meet - Four two-man teams.

1.	Jiri Kalina (Czech)	27:10	26:30	53:40
2.	Zoltan Oscody (Hungary)	24:01	26:55	50:56
3.	Karoly Biro (Hungary)	25:30	21:00	46:30
4.	Mihail Teut (Rumania)	21:06	22:54	44:00
5.	Otto Hints (Rumania)	20:25	18:16	38:41
6.	Dagmar Chlubna (Czech)	15:46	16:39	32:25
7.	Nicolai Bezman (Rumania)	15:27	15:09	30:36
8.	Stefan Ionescu (Rumania)	11:51	13:53	25:44

Team Standings:	1.	Hungary	97:16
	2.	Czechoslovakia	86:05
	3.	Rumania A	82:41
	4.	Rumania B	56:20

The underground location of this site gives a constant temperature of 11-12° C. - quite chilly! Lighting is poor enough to require work lights for winding, but the site is almost drift-free; none of the official flights hit the wall.

Debrecen, Hungary May 21, '67 28 m. site

1.	Zoltan Oscody	(Debrecen)	25:11
2.	Andras Ree	(Budapest)	24:55
3.	L. Gyarmati	(Veszprem)	22:33
4.	Karoly Biro	(Szekeslehervar)	22:29
5.	K. Hajba	(Szekeslehervar)	22:07
6.	Antal Egri	(Budapest)	20:18
7.	Gy. Buzadi	(Pecs)	20:07

This contest was held at the University in Debrecen, site of the '66 W/Ch. It was the Hungarian Championship, where the teams from various towns vie for top honors. The results above are incomplete, but the team from Szekeslehervar was declared winner. (Scores based on single flights).

Budapest, Hungary June 4, '67. 14.9 m. site

1.	Zoltan Oscody	18:48
2.	Andras Ree	18:12
3.	Gyorgy Buzady	16:26
4.	Karoly Biro	16:06
5.	Geza Varszegi	15:39

This was an annual challenge cup contest held by the Ganz-Mavag Model Club of Budapest. These five top times all exceeded the previous Hungarian Cat. II record of 15:16 held by Geza Varszegi.

Helsinki, Finland Aug. 6, '67 14 m. site

1.	Leif Englund	17:47	17:27	35:14
2.	Harro Erofejeff	16:02	15:20	31:22
3.	Harri Raulio	15:30	13:25	28:55

Brno, Czechoslovakia Aug.'67 42 m. site 20 contestants

1.	Jiri Kalina	26:43	25:37	52:20
2.	Eduard Chlubna	22:41	26:04	48:45
3.	Sitar	24:38	23:22	48:00
4.	Dagmar Chlubna	22:42	25:16	47:58
5.	Rybecky	23:08	24:49	47:57
6.	Manfred Koller	19:00	22:27	41:27

This site, the same as listed above, is the exhibition hall in Brno. Ventilation holes around the perimeter of this very large building (over 100 m. in diameter) make it very dependent upon outside conditions. The times listed above were all made in the first day under conditions said to be the best ever observed in the site. The next day it rained, and flying was impossible.

Dortmund, Germany Aug. '67 24 m. site (Westfallenhalle)

65 cm FAI

1.	Manfred Koller	19:33	21:26	40:59
2.	Hans Beck	19:44	20:36	40:20
3.	Kurt Vogler	19:34	19:22	38:56
4.	Gunter Maibaum	9:40	- -	9:40

35 cm. Microfilm

1.	Tiemann	12:56	12:42	25:38

35 cm. Paper Stick

1.	Gunter Maibaum	11:01	11:17	22:18

Unlimited Paper Stick

1.	Klaus Wetsel	16:00	16:08	32:08

Westfallenhalle is one of the best sites in Germany. It has large floor area and low drift, but a rough ceiling. The low drift comes from the building-within-a-building construction which buffers the flying area from outside disturbances.

THE TRAINING OF A CHAMPION

(cont. from Sept.)

Nurnberg, 4/9/66

Dear Karlheinz!

Many thanks for your last letter and the valuable information. Last Friday we got permission to fly in the exhibition hall. So I first built two models with 35 cm span. First, to become acquainted with the technique and second to have some models for the contest.

The flying made lots of fun since there were a lot of people with models. Strattner, Rupp and Zillinger from Nurnberg, Reda and Dreyer from Munich and Koller and Horcika from Salzburg. Very often the models hang up on girders and lamps of the roof, but we could catch them all because a big fireladder was available.

Best time of the day was 9:00, which I did, second was Koller with 8½ minutes and Rupp third with a very heavy model which flew over 7 minutes.

The mixture for the film with your recipe gave no sufficient film. It was impossible to get a sufficient thin film out of the water. The film seemed too brittle. So I used the mixture which Gerry Weinkopf describes in his book. I think that I will need all my spare time in the near future for building FAI-indoor models,so don't be astonished if you don't get any mail from me in the next weeks.

Best regards,
Hans

Berlin 4/11/66

Dear Hans!

Many thanks for your last letter. I am not happy to hear that you are fiddling around with 35 cm models. You will see that a 90 cm model is a different affair and that it is of great advantage to collect experience with this class. Of course it will last some time till you can build a model which can be used in a contest. I think that the tenth model you build will meet this demand. So you can see that you may not lose any time.

I first made lots of different solutions of film, since film with the basis of "Clou" is not too easy to make, but on the long end I found that only this base will allow films with sufficient stability when poured in extremely thin sheets. If you write that the film was too brittle, you must add Eucalyptus oil. Ricinus is not good because the film becomes sticky, heavy and tends to warp the model too fast.

I would recommend to use for the relatively low site at Debrecen not the full length of my motortubes. You could not use it fully. Cut down a little the length of the motortube and lengthen the tailboom the same part. Thus the weight of the model and the rate of sink is less. This will afford a change of size and pitch of the prop

(more pitch). On the other hand it should be useful to push the center of gravity backward a little, but not on your first model. But now be diligent.

Best regards,
Karlheinz

Dear Karlheinz!

Today I had the first flying session with the fruits of my work. I succeeded in reducing them immensely. I had two models with me, one weighed 1.16 g and the other 1.09 g. Both flew well from the first; I only had to change the difference between wing and stab and to enlarge the washin on the left wing. So it seems as if your design is not the worst.

Following your advice I built a prop with more pitch and more area in front of the spar. This caused a slower and thus a longer flight time. The longest flight was 10:05 with 700 turns. The model climbed to 10 m height in 4 minutes. When retrieving the model, the compression rib of the stab loosened and ruined the stab. To avoid this for future occasions I slightly colored the glue. Now I can clearly see where and how much one has glued on the various parts of the model.

To be able to fly more, I made from the two damaged models one new one. This brought a longer and heavier tailboom which caused the CG to wander even more to the rear. The result was surprising. The model climbed much more stable than before. It equalized turbulence of the air much quicker and gained height quicker. After five minutes the end had come; it hung on one of the lamps.

Since there is now space in my box, I am preparing a series of four models. I am building the different parts also in series and so it reduces building time.

With the film all is now okay. I only had to use more Amyl Acetate than you told. I am now using 15-18%. My tank is now much bigger - it is 140 cm long and 80 cm wide. The previous small tank was, to my opinion, the cause that I could not get sufficient films.

The hoop was also a problem in the beginning. I first used hoops with flexible sides but only rarely succeeded in getting a film out of the water. In my despair I tried stiff frames (Manfred Koller told me that the Americans are using them with great success). To my astonishment the first attempt was a success. Also very thin films could be produced with ease.

Next Saturday we will fly in the exhibition hall again. Perhaps you can arrange your next journey this way, that ou visit our testflying. Manfred Koller and Werner Stratner will also come and we can fly the whole day.

Many thanks for the magazines with the Bilgri article. I looked them over, but had no time to study them minutely. I will do it after the World Championships and thus see what I did wrong.

Best regards,
Hans

STATE OF THE ART

On this page and the next you will find three-views of models which well represent the state of the art in the homelands of their owners. On this page is Manfred Koller's FAI model, which holds the Austrian Cat. I record at 12:08 and which also won the contest at Dortmund, Germany as reported elsewhere in this issue. On this plan and the others presented, all dimensions are in mm and all weights are in grams.

The two models on page 4 belong to Andras Ree of Budapest, Hungary and Otto Hints of Rumania. Otto's model now holds the Rumanian national FAI Cat. IV record, which was set in the salt mine mentioned in the contest reports. Andras has been running a very close second to Zoltan Oscody of Debrecen all season, and has a very good model. The contrast in design philosophy between Otto's model and the other two exactly parallels model development here in the U. S., with Otto's wing area of about 100 sq. in., and the other two models around 130 sq. in.

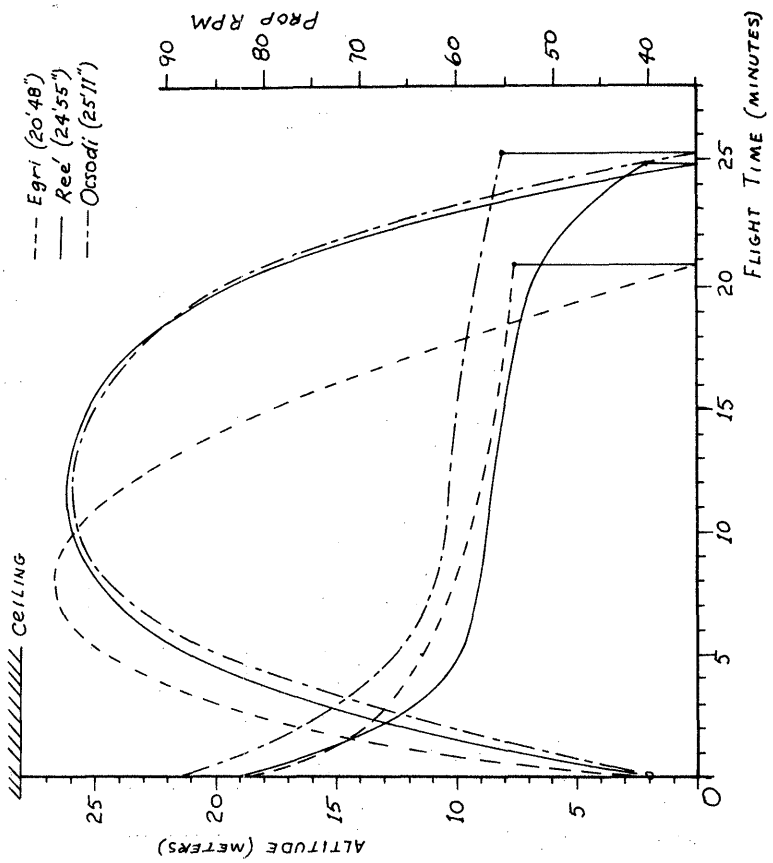
Also on this page are flight profiles taken at the May 21 contest in Debrecen. This type of flight information is quite important (as I keep saying), and the Hungarians are the only fliers who consistently record such information as far as I can determine.

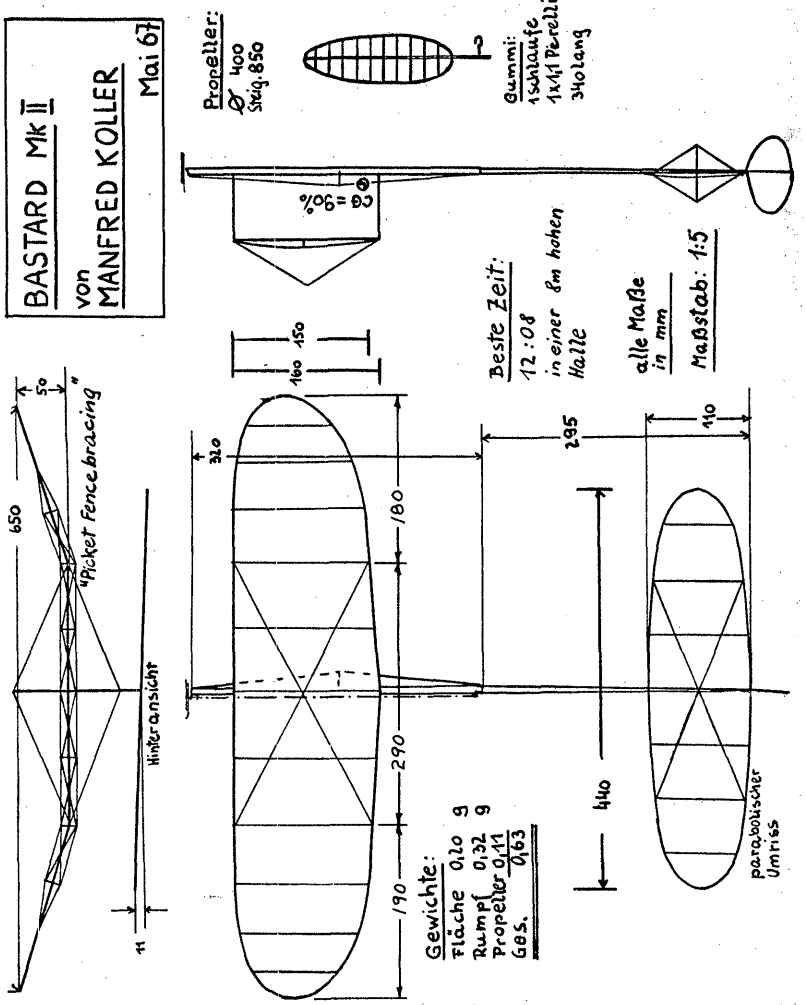
LAST MINUTE BULLETIN

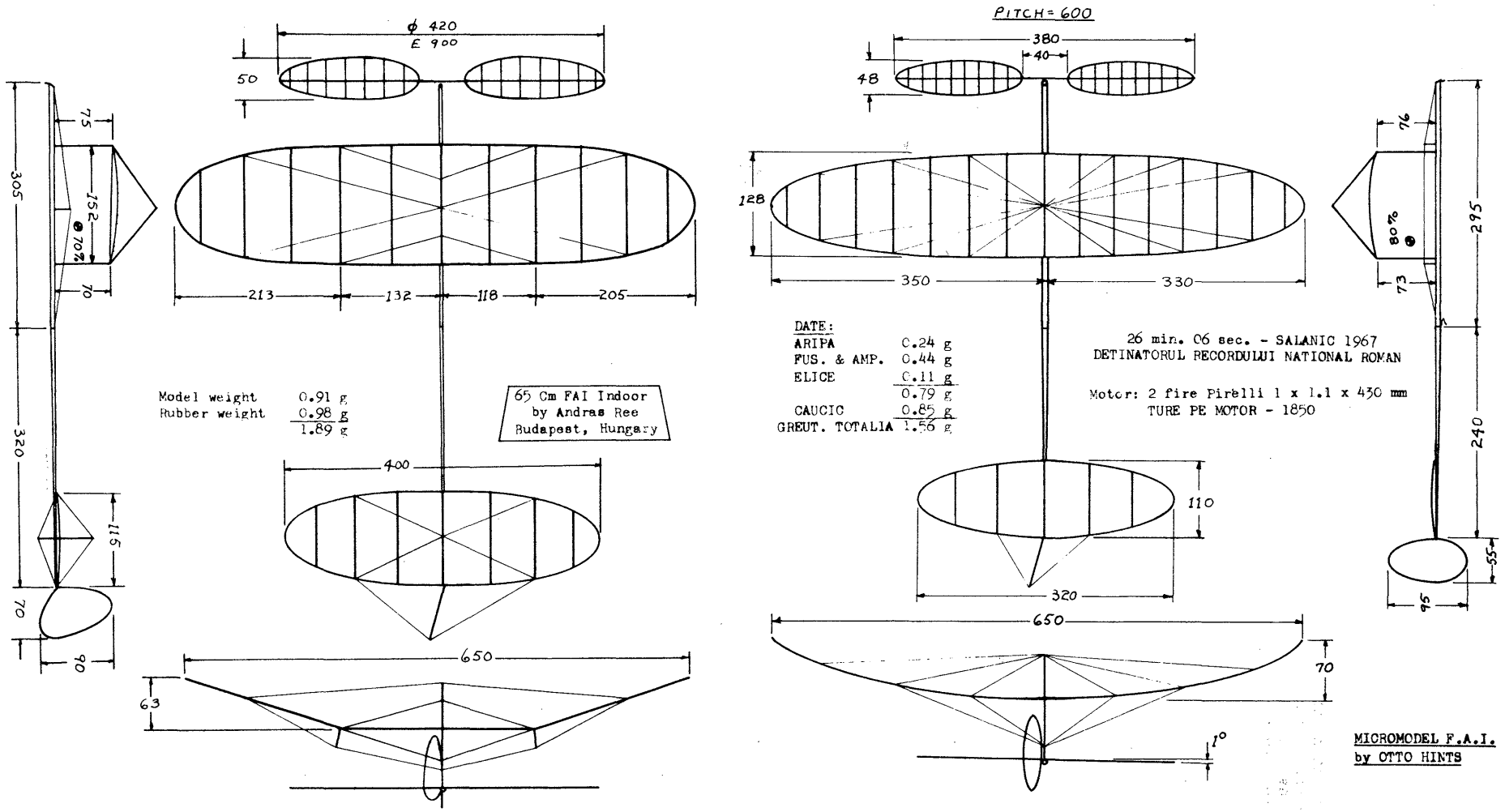
Results from Coppa Urbe 1967 (This was the indoor contest held in the Palazzo dello Sport in Rome, Italy. Site has approximately 34 m ceiling.):

1. Jiri Kalina - Czechoslovakia 2. Hans Beck - Germany
3. Manfred Koller - Austria 4. Bud Romak - U.S.A.

More complete results next month!

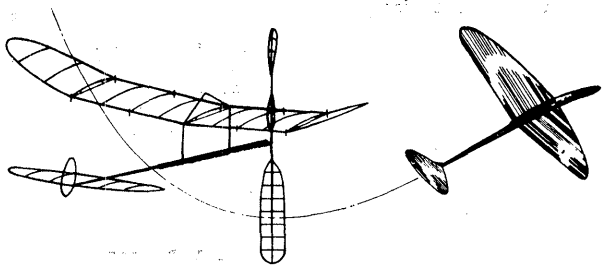





ϕ 420
E 900
50
75
305
152
70%
70
213
132
118
205
320
115
70
40
400
650
63
Model weight 0.91 g
Rubber weight 0.98 g
1.89 g
65 Cm FAI Indoor
by Andras Ree
Budapest, Hungary
PITCH = 600
380
40
48
128
350
330
DATE:
ARIPA 0.24 g
FUS. & AMP. 0.44 g
ELICE 0.11 g
0.79 g
CAUCIC 0.85 g
GREUT. TOTALIA 1.56 g
26 min. 06 sec. - SALANIC 1967
DETINATORUL RECORDULUI NATIONAL ROMAN
Motor: 2 fire Pirelli 1 x 1.1 x 430 mm
TURE PE MOTOR - 1850
110
320
650
70
1°
76
80%
73
295
240
55
95
MICROMODEL F.A.I.
by OTTO HINTS

The Voice of N.I.M.A.S. NOV·1967

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

WILLIAM R. BRECK, JR., 75 East End Ave., New York, N. Y.
K. N. GREGORY, Box 551, Grand Forks, B. C., Canada
ROBERT S. PIONE, 10340 Southwind Dr., Cincinnati, O. 45242

Tell It To The Editor!

Each time you read a model airplane magazine, you are usually impressed by something - an article, story, or whatever. It is possible that you may be unfavorably impressed - but most of the time you won't be neutral. The point is this: the editor of that magazine is doing his best to cover the model airplane field according to the balance of interest as demonstrated by his readers. If you don't write and tell him when you really enjoy his choices of material, he most likely won't be very likely to print more articles in that field for some time - other readers will have told him they liked some other article! When an indoor article appears, it is especially important to respond. Indoor fliers are so few in comparison to the other fliers that a lack of response is sure to make him wish he had used the space for something else. It is fine to write the author (if you know him), but be sure you send it via the editor so he knows you thought it was a good article.

Help NIMAS

In recent months, new NIMAS members have been getting an info sheet detailing all the NIMAS services. In case you don't remember them, here is the list: Back issues, sponsored Junior memberships, NIMAS Awards, NIMAS Certificates, free dacron, postal contests, film library, and family membership. In addition, the NIMAS Award forms have blanks for biographic information which should enable someone to write up a nice press release to your hometown newspaper when you receive a NIMAS Award. Thanks to the generosity of many members, the NIMAS files contain many full size plans and other similar information. Someone could organize this material and set up a plans loaning service. Someone could begin with various slides and pictures on hand and arrange some color slide shows of epics such as the Finals at West Baden. In short, the list of NIMAS services could be expanded if someone would volunteer to handle the extra services. Of course, there is always need to work up the three-views on hand for future issue - easy drafting work, but time consuming.

Finally, a good start is being made in planning the Dick Black Memorials, but much more help and suggestions will speed the work. These Memorials are to be slide and tape lectures giving instruction in various indoor building techniques, and we could use some "script writers" to insure that we get the material properly covered.

Change of Address

Bob Champine has moved and requests that all mail be sent to:

Bob Champine Phone 851-3469
360 Abingdon Circle
Hampton, Virginia 23369

Any NIMAS member may have his address change announced when he moves, by simply requesting this service. A NIMAS member may also receive a copy of the NIMAS mailing list by sending a stamped, self addressed envelope with his request. These two services encourage closer communication and friendship between members - as if indoor fliers needed encouragement!

NIMAS Awards

Gold Cat. I Rubber Award - 14:54.4, Tom Vallee

Financial Report

This issue begins the seventh year of publication of INAV. NIMAS has continued a slow, steady growth, with average circulation up 4% from 1966 at 222 issues per month. Average circulation to fliers in other countries has been 22 issues per month. The 1967 income totalled $613.50, including donations for some issues going to Eastern Europe. Expenses break down thus:

Printing INAV	$257.96
INAV Postage	154.51
Other postage	104.50
Office supplies	62.00
	$578.97

A bit of subtraction shows a net surplus of 34.53, about the same surplus as for 1966. A summary of all six years of NIMAS operation leaves a net deficit of about $60.

Production time per issue continues about 65 hours, and correspondence for 1967 was 25% higher than 1966, with 844 letters incoming and 1023 items mailed out.

CONTEST CALENDAR

CALIFORNIA - Long Beach. The Douglas Cloudsters are holding indoor sessions at the Long Beach City College Gym each Wednesday, 7:30 pm to 10 pm.

INDIANA - Kokomo. The Kokomo Aero Team's popular indoor meets will resume at Bunker Hill AFB on Nov. 19, and on the 3rd Sunday of each month thru April 1968. Chuck Borneman, 1401 W. Taylor, Kokomo, Ind. 46901

MARYLAND - Wheaton. D. C. Maxecutors sessions at Kennedy High School - 7 pm to 11 pm. Nov. 17, Dec. 8, Jan. 12, Jan. 26. Tom Vallee - phone 498-0790, or 444 Henryton So., Laurel, Md. 20810

MICHIGAN - Ann Arbor. Ann Arbor Airfoilers indoor session at Bowen Field House, Ypsilanti, Mich. Nov. 19. Ned Smith, 928 S. Forest, Apt. 1, Ann Arbor, Mich. 48104

MISSOURI - St. Louis. Indoor Scale Contest, Assumption High School, Route 50 & 59th. St., East St. Louis. Dec. 3, 1967. Contact Kirkwood Thermaleers.

NEW JERSEY, Union. Indoor sessions, Franklin High School, Union, N. J. 7 pm to 10 pm. Nov. 16, Dec. 14, Jan. 11, Feb. 15, March 21. Ernie Kopecky, 38 Fawn Lane, Watchung, N. J. 07060

OKLAHOMA, Tulsa. Indoor contest for HLG, Scale, Easy B-sized models. Nov. 17, 9 am. Bob Hanford, 3838 South 88th East Ave., Tulsa, Okla. 74145

OHIO - Cleveland. Cat. I Record Trials Dec. 10, St. Ed's High School, Lakewood. Great Lakes Indoor Air Meet Jan. 14, Cat. II R. T. Jan. 13.

TEXAS - Denton/Dallas/Ft. Worth. Cat. I Record Trials planned during or after Thanksgiving holidays. Bud Tenny, Box 545. Richardson, Tex. 75080

FAI INDOOR REPORT

Report From Budapest

This year the October CIAM meeting was held in Budapest, Hungary. Bob Champine attended as the U. S. delegate to the FF Subcommittee again, and reported a very interesting meeting and excellent hospitality by the Hungarian Aero Club. The only item of indoor interest is the newly adopted steering rule. Bob reports the official wording is similar to the proposed version printed in the '67 INAV, except that three steers of 15 seconds maximum are permitted, using any part of the balloon or string or with a stick between 2 m long and 8 m long. It was also officially decided that the 1968 W/Ch will be in the Palazzo dello Sport in Rome, Italy. Because of severe drift in the daytime (see report below), rounds will be flown from 1700 to 2100 and 2100 to 0100. At least one day will be provided in advance for test flying, in addition to the daytime periods. Any bets on how much sleep the fliers will get?

Report From Rome

All reports of Coppa Urbe 1967 stressed the excellent organization of the meet and the wonderful hospitality of the organizers. The actual contest results reflect the high drift in the site during the daytime (caused by many skylights), but night time test flying revealed that the drift abated at sundown, leaving an ideal site. The very high standard of flying displayed by Jiri Kalina (holder of two World Records) has another side not generally known by other fliers. He arrived in Rome with all his models needing the wings re-covered. His repairs were completed one hour after Round I started, and his Round I time was made with an untested model (29:11).

1.	Jiri Kalina	Czechoslovakia	29:11	29:35	58:36
2.	Manfred Koller	Austria	26:22	24:07	50:29
3.	Hans Beck	Germany	22:21	25:47	48:08
4.	Bud Romak	U. S. A.	21:21	19:47	41:07
5.	Loris Kenneworff	Rome	12:49	13:59	27:48
6.	Egizio Corazza	Firenze	13:33	13:15	26:48
7.	Germano Mascuillo	Rome	11:13	13:09	24:22
8.	Carlo Cotugno	Rome	13:09	10:08	23:17
9.	Giovanni Federici	Rome	8:35	13:09	21:44
10.	Ludovica Corazza	Firenze	12:10	8:30	20:40

Fifteen fliers (all from Italy except as noted above) entered the contest. One woman flier (Ludovica Corazza, wife of Egizio Corazza) was entered.

RECORDS? MAYBE!

D. C. MAXECUTORS RECORD TRIALS, Oct. 27, 1967 20' ceiling
J. F. Kennedy High School, Wheaton, Md.
FAI Cat. I FAI - 14:54, Tom Vallee

INDOOR RULES

The Contest Board is approving (it appears that this measure will pass; voting is in progress) a change in Sec. 2.2 of the Rule Book. The intended effect is to permit a record to be set with only one flier in attendance. The attempt is to be conducted by a CD, and timing must be taken as the average of times recorded by two officials other than the CD. So, since this seems sure to pass, you soon should be able to make serious record attempts with no worry about whether enough fliers will show up to qualify the session as a record trials. In fact, if you do have a one-man session, you should be able to keep flying as long as you can persuade the CD and timers to hang around!

INDOOR PROPS - PRACTICE

The basic definition of prop pitch (pitch of any part of the blade) is: 3.14 x diameter of prop at station in question x geometric tangent of the blade angle. The most common propeller construction method is the one popularized by Joe Bilgri - the prop is built on a carved block as shown in Fig. 1. Fig. 2 shows dimensions of such a block as related to the design formula for the block:

$$1.\quad \text{PITCH (of block)} = \frac{3.14 \times D \times T}{W}$$

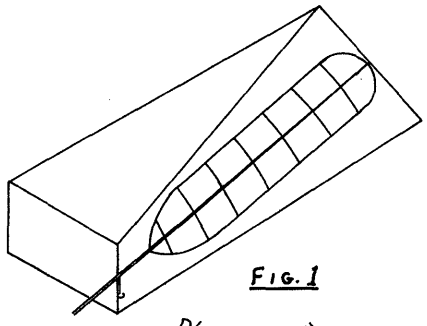


Fig. 1

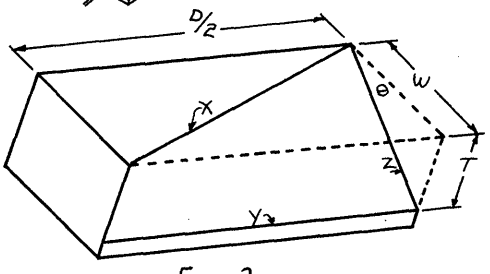


Fig. 2

Note that the tangent of angle θ in Fig. 2 is T/W, which relates the block design back to the basic formula mentioned above. That is, arc tan T/W is the blade angle of a prop blade element at radius D/2, if the prop was built on the block in Fig. 2.

To design a prop block, it is more convenient to rearrange formula 1 to one of these:

$$2.\quad T = \frac{P \times W}{3.14 \times D} \qquad 3.\quad W = \frac{3.14 \times D \times T}{P}$$

Formula 2 is used if the block you have is wide enough to use the full thickness of the block; if the thickness is a limiting factor, use formula 3. Once the block has been designed, mark lines on the block (lines x, y and z on Fig. 2) to guide your carving. Carving an accurate block takes care and skill, but the sketches below show shortcuts used by some NIMAS members (reprinted from earlier INAV's).

Bill Graham suggests that metal straightedges be laid along lines x and y (see Fig. 3), then saw cuts can be made down to the metal. A few quick cuts with a knife will take off most of the excess wood, then a round sanding block will finish the job.

Ed Hicks accomplishes the same thing while using a bandsaw and a plywood stop as shown in Fig. 4. For each cut, tilt the block forward into the saw until you reach the diagonal line (x). Adjust the plywood stop so that the saw just reaches line y; the result is the same as with the method in Fig. 3. Dick Ganslen suggests that plywood be put beneath the block also; if the stop is mis-adjusted or rides forward, you can hear it hit the plywood.

One final suggestion: be sure that you are through carving before you begin to sand the block. If you ever try to carve down a high spot after sanding on it, small bits of grit from the sandpaper will ruin your blade.

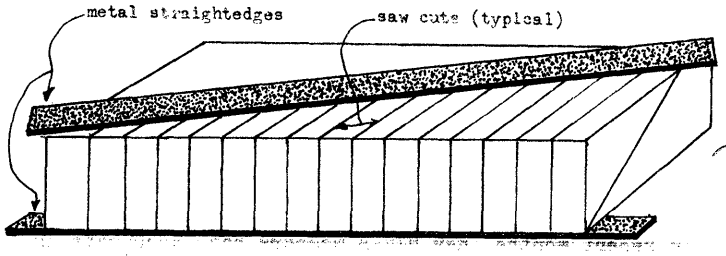


Fig. 3

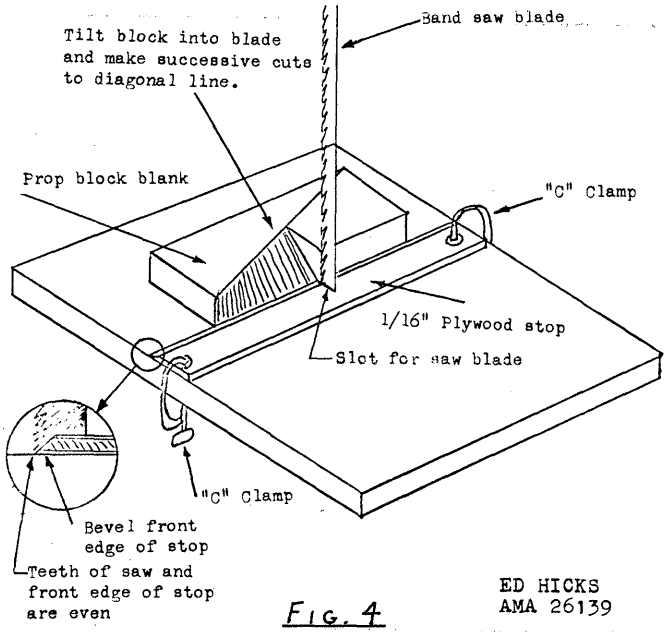


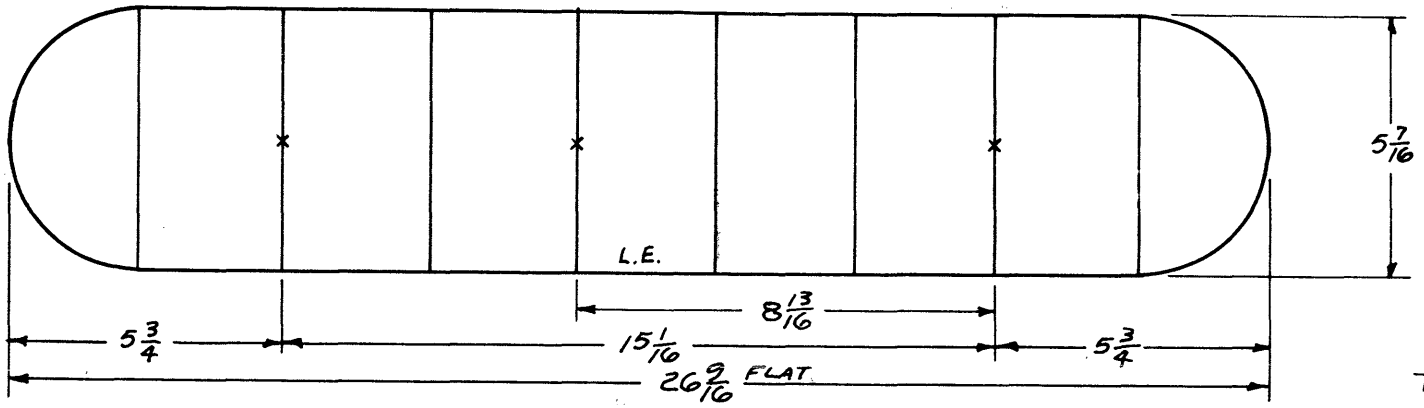
Fig. 4

ED HICKS
AMA 26139

STATE OF THE ART

The model of the month, Al Rohrbaugh's West Baden winner, completes the presentation of models flown by the 1968 Indoor Team. Several features of this model are very similar to Jim Richmond's model (July '67 INAV), and Al credits Jim's performance in causing him to use a similar wing. Other interesting features of the model are: small diameter motor stick with 2-wire bracing, very light wing loading and the largest prop of any of the qualifiers to the Finals.

$25\frac{7}{16}$ PROJ. SPAN
132.7$^{\square}$" PROJ. AREA

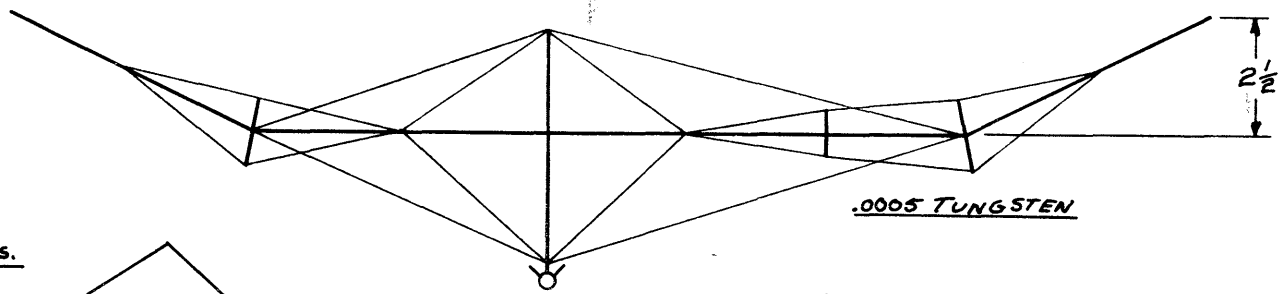


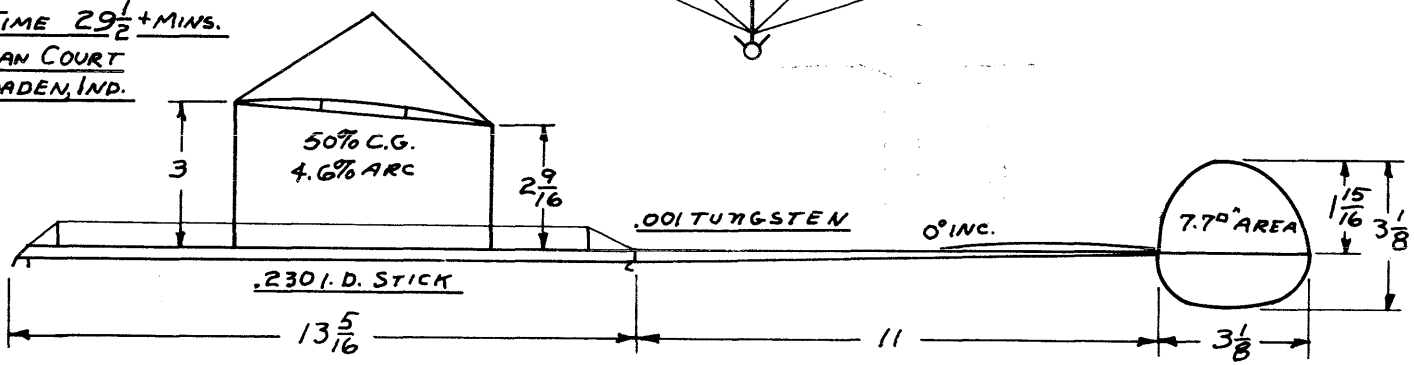
X INDICATES COMPRESSION RIBS

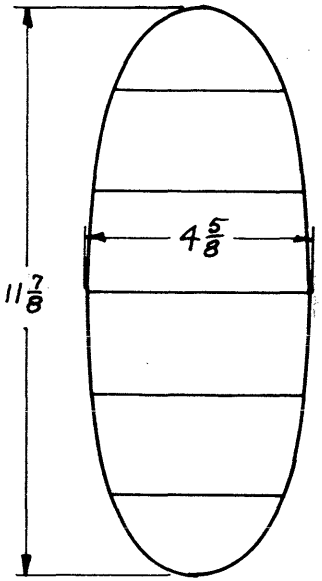
WGTS.
STICK ASSY-.012
WING - .0075
PROP. - .0045
.024

18" LOOP OF .052
PIRELLI .041 OZ.

BEST TIME $29\frac{1}{2}$+ MINS.
POMPEIAN COURT
WEST BADEN, IND.

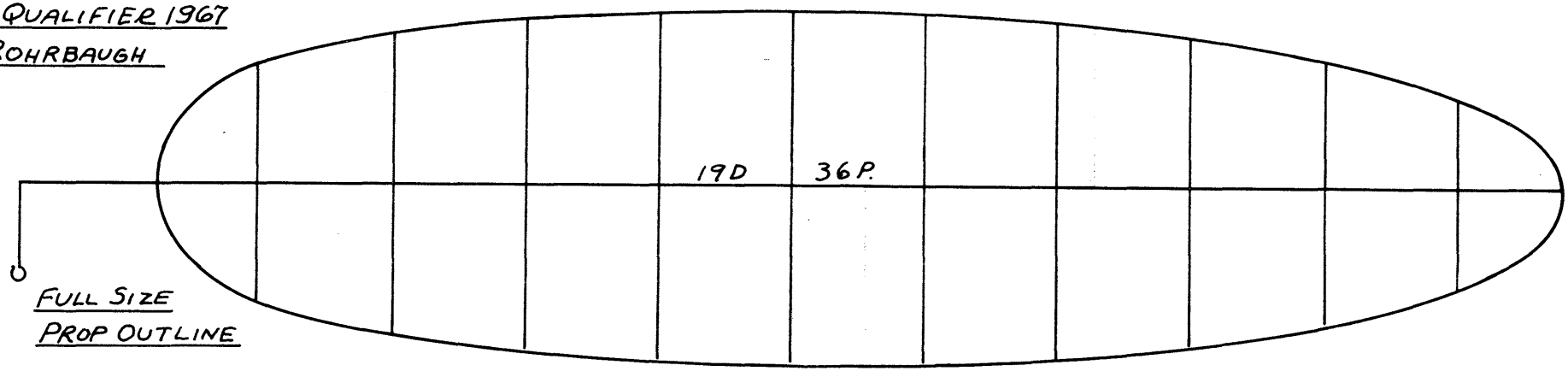






STAB. AREA 46$^{\square}$"

FAI QUALIFIER 1967
A. ROHRBAUGH



FULL SIZE
PROP OUTLINE

INDOOR PROPS - THEORY

This is the first in a series of articles dealing with indoor propeller theory and application. Some theory to be presented is sound from a theory standpoint, but hasn't been proven or sometimes even tried adequately in practice. Therefore, it is desirable that differing opinions and supporting comments be submitted. Speak up!

The prop is the most important component of a model, but indoor props are often misunderstood or mis-applied. A good prop, matched with proper power to even a heavy model, will give excellent results in low and medium ceilings. An excellent example of this is Hewitt Phillip's record B/FAI (May '67 INAV) - the wing loading of this model is twice as high as the models of Jim Richmond and Al Rohrbaugh. Even so, the record of 16:59 was set in a 20' site. In higher ceilings, a lighter model helps, but the prop is still the most important.

Prop design must begin with choice of proper pitch (blade angle) to suit the model. Begin by measuring the level flight cruise velocity of the model: Trim the model for best level flight, put in enough turns for the model to climb about 10', and begin timing how long it takes the model to complete each flight circle. Measure the diameter of the flight circle. As the model levels out and starts to descend, the velocity will settle to a fixed value; this is cruise velocity.

Decide what cruise RPM you would like to have, and construct a triangle like Fig. 1 below. The base represents the distance traveled by a blade segment in a given period of time, while the side represents the distance the model travels in the same time. For example: 50 RPM and model velocity 2'/sec. If we consider a blade segment at 5" radius, the base of the triangle is 5/6 rev./sec. x 10 (blade diameter at 5" radius) x pi (3.14) = 26.2". The side of the triangle is 24", and α (model advance angle) = arc tan 24/26.2. From the definition of pitch:

Pitch = 3.14 x Dia. x tan Blade Angle

we find the model advance angle corresponds to a pitch of 28.8". Refer to Fig. 2: This shows the triangle of Fig. 1 with a 7° angle of attack (7° is customarily "defined" as a "good" angle of attack for a prop blade) superimposed on it. The advance angle (α) = arc tan 24/26.2 = 42.6°. Including the angle of attack, the required blade angle is 49.6°, which corresponds to a pitch of 36.8". Thus, your prop design pitch, for any model which flies 2'/ second, is 36.8" if you desire 50 RPM in the cruise.

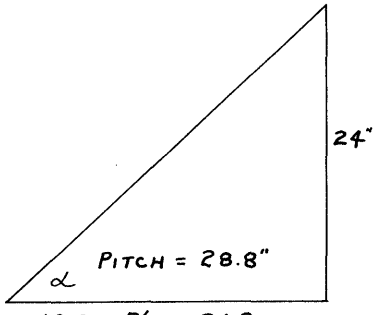


FIG. 1

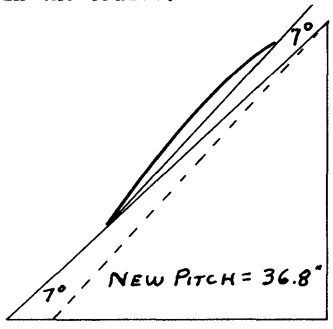


FIG. 2

Let us review what happens if flight conditions change to remove the angle of attack. A good illustration is on page 3, Oct. '67 INAV, in the flight profile of Andras Ree's model. The RPM began to drop severely at about 20 minutes; project upward to the altitude curve and you will notice that his descent slope gets steeper at the same time. Roughly, the sequence of events is this: 1. Torque drops below the value required to maintain a critical RPM. 2. A reduction of torque permits RPM to drop until the blade angle of attack goes to zero, thus reducing the thrust almost to zero. At this point, the prop is windmilling. 3. The model's nose drops and rate of descent increases. The model is trading altitude for energy to "push" the prop; the condition gets worse until the motor unwinds enough to permit the prop to jam.

You can demonstrate the effect of loss of torque quite easily. Fly your model in a site which will permit a 10 minute flight without touching the ceiling, while using a loop of rubber with about 3" of slack. Carefully record the turns put in, turns left and flight time; from this compute average RPM. Repeat the flight with a loop which has no slack, and record the same information. If the model does not dead-stick before landing, the RPM with the short loop will be about 10% lower during the cruise, and the average RPM will be lower also. The real problem in getting the last little bit out of a cruise is obvious - it takes careful flight trim and an analytical approach to determine (not guess!) when the prop is matched to the model. After the critical RPM for each part of the flight has been determined, simple RPM checks will help you make sure you are still in trim.

As a guide to proper choice of pitch for your model, the following table lists pitch vs. RPM for several model speeds: (Pitch computed for 5" radius; 7° angle of attack,

Velocity - 1.5 feet/sec.

RPM	50	60	80	100
Pitch	28"	24"	18"	15"

Velocity - 1.8 feet/sec.

RPM	50	60	80	100
Pitch	33"	28"	21"	18"

Velocity - 2.2 feet/sec.

RPM	50	60	80	100
Pitch	40	34	24	21

The discussion above covers choice of prop pitch, but other prop parameters are governed by model performance also. Blade area in a final design is decided by prop RPM. That is, build a prop according to your best guess for area and using the design pitch. Fly it and measure RPM at the model velocity used in the design procedure. If the RPM is high, increase the blade area.

Once the blade area is set, prop diameter is likely to be pretty well set also. Next comes blade shape. From a purely aerodynamic standpoint, blade shape has only a small effect on performance. Blades shaped to flare don't enter into the consideration, since formal theory assumes a rigid blade. Analytical discussion of flaring props will be difficult or impossible until the blade configuration under load can be measured.

Many people still consider pitch/diameter ratios while designing props; but P/D is relatively meaningless. Early (1930 era) indoor articles were quite preoccupied with P/D ratios; I believe this was due to the use of carved props. Carved props have a practical limit on diameter, and the models of those days were heavy. High wing loadings resul in high cruise velocity; thus high pitch was necessary to have low cruise RPM. Thus P/D was also high and necessary.

Modern props have no similar diameter limitations, and Hacklinger suggests that choice of diameter is based on flight performance, with limitations caused by the effect of propwash on wing efficiency. If a flight profile of your model shows better performance with a long prop, use it!

THE LAB

Making Flight Profiles

A complete flight profile is the most powerful tool available to the model airplane designer as he seeks to improve his model or prove out a modification. And the complete flight profile is the only method of prop performance analysis which enables a study of prop performance during each phase of the flight.

The complete flight profile consists of three parameters measured as a function of flight time: altitude, RPM and model velocity. Until a graph of model velocity is added to the other two parameters, prop performance can only be considered in terms of an average over the total flight. Props are required to handle high power at the first of the flight, and then give efficient performance in the cruise. These requirements are somewhat contradictory and the final prop design must be a compromise in order to get the best overall efficiency.

RPM is the easiest to measure: record how long prop takes to make ten revolutions; make these checks at regular intervals during the flight. Afterward, divide the time for 10 revs into 600 to get RPM. Altitude is more difficult; perhaps the easiest way is to let a balloon with a calibrated string rise just alongside the model. A helper can stand back and help judge that the balloon and model are at the same altitude. Every two circles, read altitude off the balloon string and record altitude and flight time. Model velocity is measured by determining the flight circle diameter (two people can align themselves with the opposite sides of the flight circle while holding a tape measure) and recording the elapsed time per circle. It is helpful to have some kind of special chart to record flight data, since a great many measurements must be made in fairly short time.

THE TRAINING OF A CHAMPION

This segment of Hans Beck's story of his preparation for the World Championship (translated by Manfred Koller) completes this series. The first installment appeared in May '67, with parts in June, September and October. If you have glossed over it, re-read it all before starting this part.

In the whole story you will find hints on low ceiling test flying, rubber selection, performance checking, low ceiling modifications for models, covering and bracing the elliptical wing popularized by the Germans, and other small hints. Through it all shines hints of the sunny disposition, sharp wit and calm determination of Hans Beck as he began early in March to prepare for the World Championship the following July.

Beginning with experience in the German 35 cm class, and adding wood selected by Rieke, Hans followed Rieke's instructions and examples to build models good enough to win. Anyone who has followed the development of International Class indoor flying knows that it was not an easy win either - Hans posted the highest six-flight total ever flown in that site, and three of his six flights exceeded the previous site record by a fair margin. Good Work!

Berlin 5/25/66

Dear Hans!

Many thanks for your interesting letter. I am sorry to tell you that I cannot visit your testflying. I am under big-time pressure in respect of business.

In all cases I would advise you to build the motor-tubes stiff enough. Nothing is more disappointing but a model with fully wound motor, exploding in little pieces. You must regard that in a contest you have to pack 1800 to 2000 turns on the motor. This push and the usual trembling of the hands at a contest must be withstood by the model.

If you build a prop with more area in front of the spar, it perhaps is not good also to enlarge the pitch. During the climb the blades of the prop are opening themselves, thus enlarging the pitch even more. In this way the pitch may become too big and so decrease the efficiency. But the whole is worth a try. Perhaps a propeller of this kind with a little less pitch would also be useful. Such a propeller would have more efficiency in the last part of the flight when the force of the rubber gets smaller and smaller.

Have you already made tests of the revolutions per minute of the prop? Hacklinger and I did this very often by counting the revolutions of the prop during climb, cruising and descent. For one test we counted 10 revolutions and measured the time. In my respect the data were: 0.8 rpm with fully wound motor, rapidly going back to 0.6 rpm and 0.5 during the descent if not less. For your tests I recommend to use a very short loop of rubber, lengthened by a wire to the rear hook, like I described it earlier. You must collect experience how the model performs under full power. It can happen that the model performs quite nice with 700 turns but is impossible to fly with 2000 turns. You can decide the motor length only during the testflying in Debrecen. You know that the motor should land with some turns left on the motor. If the motor is too short, the model lands without the prop turning (lots of drag). If it is too long, the model climbs too slow and lands with too much turns left on the motor. To find the right length affords lots of test flying, especially because another prop with less or more pitch and/or diameter can give the same result.

What do you say about the photos of the site in Debrecen? I must warn you in one respect: the ceiling of the site is formed in such a manner that when the model touches the ceiling in <u>any</u> point, it does not come free from the wall and is centered in one corner where it hangs up. So it is vital that you stay away from the ceiling.

It is very important that you have sufficient rubber loops of different dimensions. I think that I would have come near to 50 minutes at Cardington when I would have one loop a bit thinner or 2 cm longer. I think it will be necessary for you to cut the necessary sizes at Debrecen.

Best regards,
Karlheinz

Berlin 5/26/66

Dear Hans!

We can fly the Saturday and Sunday in the Deutschlandhalle at Berlin. I would say that you should come on Friday, and we can fly on Saturday in the morning and then repair if necessary and fly again on Sunday.

Best regards,
Karlheinz

(The next letter was from Hans to Manfred Koller, reporting the results of the Deutschlandhalle session).

Nurnberg 6/14/67

Dear Manfred!

Many thanks for your last letter. My report to you is overdue, so here it is: It would have been beautiful to fly 30 minutes, but it was only 22. We could only use 3/4 of the site and from the middle of the ceiling a lot of reflectors hang down to 10 meters. The doors were open and thus lots of drift. Rieke was satisfied with the building qualities of my models.

For testing one does this: First with 400 turns correct the radius of the curve, correct the incidence and the sloping position of the model in the curve. (Ed. note-correct the bank by changing washin.) Then on the next flight we used 1200 turns and thus the model climbed nearly to the ceiling. All the fine changes which are necessary are done by adjusting the pulling direction of the prop-bearing. It is easy to fly the models in respect to the above mentioned facts, but it costs lots of time to find the best prop-rubber combination for the site. The rpm of the prop is very important for good times: 11 to 12 sec. during climb, 13 sec. during cruise and 14-15 sec. during descent. (Ed. note - times given for 10 revolutions of the prop). These data we only got with Rieke's own props. My props were all too stiff though they had the same weight as Rieke's props. The spars were too stiff so the props would not open enough when climbing. I also had hydrogen and balloons with me, not useless, because the drift forced us to balloon the model away from obstacles. This is not very easy but extremely difficult when the model is up 20 m or more. The ceiling is 22 m high and Rieke's best time is 28 minutes.

Best regards,
Hans

Nurnberg 6/26/67

Dear Karlheinz!

Many thanks for your big help at Berlin. I think that the whole visit was of infinite importance to my indoor flying knowledge.

Now I have three quite good and well flown models and a spare fuselage. I hope this is sufficient. Last Thursday I flew in a gymnastic hall, 6 m high. Best time 10:04. A new type of propeller at last brought the necessary data of rpm in the various stages of the flight. I will now duplicate this type. I am happy to have the box full of models. At the long sight the whole mess strains the nerves a lot. I will <u>very</u> like it to cut on a considerable massive piece of balsa for a power model.

Best regards,
Hans

Berlin 6/27/67

Dear Hans!

Though I did not receive any sign of life from you, I suppose you arrived safely in Nurnberg. Otherwise it would be a pity because of your beautiful models, since they flew quite nicely. I can imagine that you are in full action building still lighter and better models.

From now on I am nearly constantly on business journeys, but always in connection with Berlin. So please send a telegram about the results in Hungary.

I can not give you much further instructions. I only want to say again, that it is necessary to outclimb the site as soon as possible. Don't fiddle around near the ground. You dare not lose any time to find the suitable prop-rubber-combination, because this is difficult enough. To avoid a too steep climb let the motor run out some 50 turnswhen holding on the ground. Make this also during testing, so that you get the right relations. Look that the prop runs round and has the right rpm. If you have found the right rubber, do not change it! Use it for every start, but adding some 50 or 100 turns for each flight. But examine the loop before each flight to see if there are tiny cuts to be seen in the rubber.

Best regards,
Karlheinz

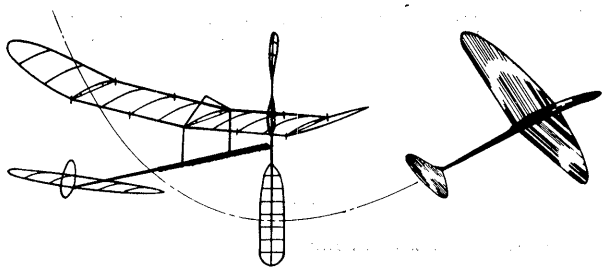
Telegram: To Mr. Karlheinz Rieke, Berlin

Debrecen 7/18/66

Holding your thumbs was successful, team of Germany won, Hans Beck World Champion.

The Voice of N.I.M.A.S. DEC·1967

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

ROBERT J. PLATT, Jr., Route 3, Box 66, Old Landing Road, Yorktown, Va.
GENE SIMPSON, 4327 McDermed Dr., Houston, Tex. 77035
JOHN J. WALZAK, 117 Berrill Ave., Waterville, N. Y. 13480

Honorary Members

GERMANO MASCUILLO, Via Bartolomeo Capasso 20, Rome 00179, Italy

NIMAS Awards

Diamond Cat. I Rubber - 15:05, Hal Crane

NIMAS Ace!

Hal Crane's Diamond Award (above) admits him to what seems to be the most exclusive club of indoor fliers - NIMAS Aces. This standing is achieved by winning each of the three NIMAS Awards (Silver, Gold and Diamond) in one of the ceiling categories. Although several other fliers could qualify on the basis of official flights already made, Bud Romak and Hal Blubaugh are the only fliers to have won this honor until now.

NIMAS has special awards suitable for framing made up for NIMAS Award winners, but we have no special award or pin of suitable distinction for NIMAS Aces. Has anyone a suggestion for such an award?

Coming Attractions

Although most of the available technical space in INAV will be on props for an issue or two, there is a microfilm series waiting in the background. This will begin with a review and updating of the series which began in Oct. '65 and ran thru May '66 (this was requested by readers). New material will include testing methods for microfilm and test results of various microfilm samples. Formulas will be given, and an up-to-date report of additives is under preparation.

Meanwhile, many people have been given questionaires (during routine correspondence with NIMAS) about microfilm usage and characteristics. This survey should give a very interesting picture of microfilm usage if everyone returns his questionaire. If you would like to participate in the survey, answer these questions and send the answers to: Box 545, Richardson, Texas 75080.

1. What brand of microfilm do you use?
2. If you mix your own film, what material (dope, nitrocellulose, etc.) do you start with and what plasticizers and additives do you use?
3. Describe your ageing process.
4. Describe your covering methods.
5. Do you check your film for static/sticky effects or notice these effects as you work with it?
6. Do your models warp after a period of time, or does your film hold its size except under unusual heat or humidity?
7. Do you make microfilm in advance or as you need it?
8. Are you satisfied with the microfilm you are using?
9. What microfilm characteristics are important for you, and which are missing from the film you use?

What color film do you use on various parts of the model?

Slides Wanted!

Planning is still under way for the Dick Black Memorial slide/tape series, and a great many topics are being considered. If anyone has color slides which might work into presentations on the following subjects, it would be appreciated if the slides or duplicates could be donated to the cause. This would speed up production, if fewer slides had to be generated now.

1. Close-up sequence of winding a model, either with a helper or on a stooge.
2. Covering with paper and microfilm, and patching film.
3. Steering a model (this might need to be a short film sequence rather than slides).
4. Basic construction techniques (wood stripping, rib cutting, building jigs, assembly, prop block carving, wing bracing, tissue socket rolling, rolling motor stick and boom, etc.)
5. Wire bending.
6. Rubber stripping.

It is still not too late to suggest other topics to be covered; our hobby isn't hard, but it is different enough to require training aids in some form to help other people to understand we aren't miracle workers or that indoor is an expert-only event.

The Picture Page

The pictures on page five were taken by Ed Capogreco at West Baden, and are presented through the cooperation of NFFS - this same spread appeared in the Nov. '67 FF Digest. Upper left - Bilgri hooks up for an official. The ominous mushroom (later named toadstool because toadstools are poisonous) appears clearly in the upper left picture. Center left - Jim Clem waits to wind Stan Chilton's Goldilox (see p. 3). Center right - model (may be Bilgri's) climbs out. Lower left - Dick Ganslen and box in foreground, Chilton in background. Lower right - Al Rohrbaugh and second place model (plans in Nov. '67 INAV).

Merry Christmas!

We would like to wish all of you the very best in the holiday season which approaches. Time and finances will not permit us to respond to all those cards we are getting, but we deeply appreciate the good wishes you send.

CONTEST CALENDAR

INDIANA - Kokomo. All sessions set for Bunker Hill AFB were cancelled due to rescheduling at the base. Send your name and address to Chuck Borneman, 1401 West Taylor, Kokomo, Ind. 46901 if you wish to be notified of possible sessions at other sites.

MARYLAND - Wheaton. D. C. Maxecutors sessions at Kennedy High School - 7 pm to 11 pm. Jan. 12, Jan. 26. Tom Vallee - phone 498-0790; 444 Henryton So., Laurel, Md.

NEW JERSEY - Union. Indoor sessions, Franklin High School, Union, N. J. 7 pm to pm. Jan. 11, Feb. 15, March 21. Ernie Kopecky, 38 Fawn Lane, Watchung, N. J. 07060

OKLAHOMA - Tulsa. Indoor contest for HLG, Scale, Easy B sized models (paper covered) and Indoor Stick. Dec. 17, Noon to 6 pm with practice session 9 am to noon. Bob Hanford, 3838 South 88th E. Ave., Tulsa, 74145

OHIO - Cleveland. Great Lakes Indoor Air Meet Jan. 14, Cat. II R.T. and practice session Jan. 13. Chuck Tracy, Aviation Editor, Cleveland Press, 901 Lakeside Ave., Cleveland, O. 44114.

TEXAS - Denton/Dallas/Ft. Worth. Cat. I Record Trials Dec. 23, 10 am to 5 pm. Bud Tenny, Box 545, Richardson, Tex. 75080 214-235-4035.

VIRGINIA - Hampton. Indoor contest Jan. 7, 1968. Don Orr, 320-D 73rd St., Newport News, Va. 23607

POSTAL CONTESTS!

This is the time of the year that clubs can start to plan their indoor season. A most rewarding and entertaining part of your indoor activity can be postal meets. If you would like to try this and need clubs to challenge, drop a line to NIMAS and an effort will be made to help match you up with clubs of similar capability. Include a

few comments about the type of models flown by your group (fliers not in a club are also welcome) and a description of your site.

Postal Results

Tom Vallee vs. Bud Tenny; 20' vs. 21' - no fudge factor

Indoor Stick (any size model)
Tom Vallee - 12:05 Bud Tenny - 8:57

Future Postal Events

The NIMAS Easy B Postal Meet is customarily held in February and March of each year. Some members suggested that additional events be held; so the following rules are offered for comment:

NIMAS HLG Postal - Any model size, AMA flight rules (Sec. 10.3 thru 10.9 in Rule Book), two ceiling classes - 18' to 25', Cat. IA; 25' thru 35' - Cat. IB. Fudge factor - ratio of ceiling heights.

NIMAS Rubber Postal - Any model size, AMA rules (Sec. 8) except FAI-type ceiling measure for fudge factor. Standard NIMAS fudge factor - Square root of ratio of ceiling heights.

Please comment on these rules as soon as possible. The reasoning behind two HLG classes is to avoid ratio of ceiling heights greater than 1.5:1, and to avoid use of the fudge factor graph (it is not as well tested as it could be). The use of FAI ceiling measure for rubber events allows more favorable competition for those who don't have sites with a flat ceiling.

INDOOR PROPS - PRACTICE

Part II - Prop Framework

Since the prop is the most important part of the model, careful and consistent construction techniques pay off in better flights. Some builders spend almost as much time building the prop as for the rest of the model, and the time never seems to be wasted.

The majority of your prop building time should go into the spar. The spar controls the prop behavior almost entirely, since it carries all bending and flaring loads. Therefore, the spar must bend equally well on either side. Fig. 1 below shows a basic jig which can be used to check spar deflection. It is sometimes convenient to substitute 6" scale on the right so you can record both the test load and the deflection for future reference. The slot at "A" should be a smooth snug fit for the spar (or adjustable to fit different spars) so the spar does not "rock" or move in the slot. Round spars should be checked for deflection four ways - rotate the spar 90° between checks. Also the deflection must be exactly the same on either end of the spar. The process of balancing the deflection is lengthy, and calls for selective sanding and checking the diameter until everything matches.

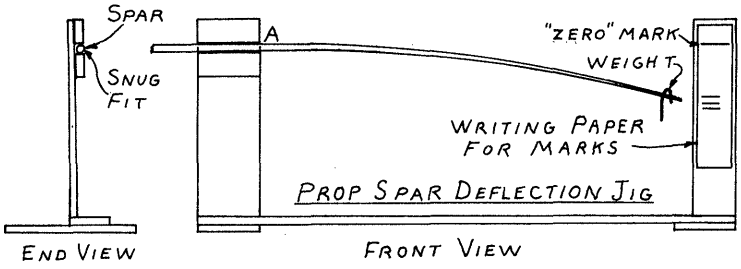


FIG. 1

Construction of the basic spar is two-piece as shown in Fig. 2 and Fig. 3 below. First choose a piece of wood just more than half the length of one prop blade; then cut and sand the wood to a smooth taper as shown in Fig. 2. Now cut two spars with a uniform taper as shown in Fig. 3. Fig. 4 shows how the two segments are spliced to form the spar. This procedure insures maximum uniformity of wood on either side of the hub, which greatly eases the matching of deflection as outlined above. Most people make a spar with round cross section, carefully rounding the basic spar shown above. The other spar choice is to use a square or rectangular spar such as those used by Charlie Sotich or Jim Richmond (see July '67 INAV for details of Richmond's spar). This type of spar is cut exactly the same way as other spars, except greater accuracy is needed to minimize the problem of equalization. A rectangular or square spar is checked for deflection only on the side and from the front; a square spar should have equal deflection in both directions.

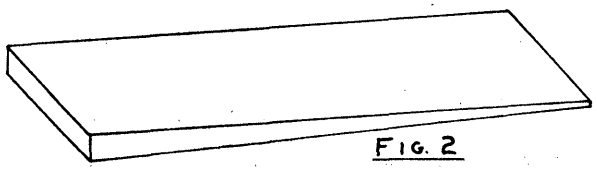


FIG. 2

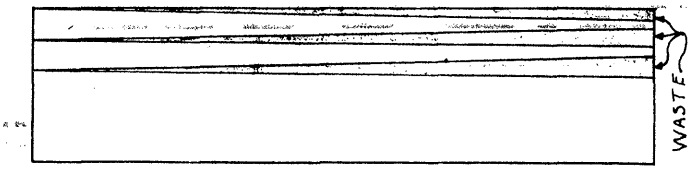


FIG. 3

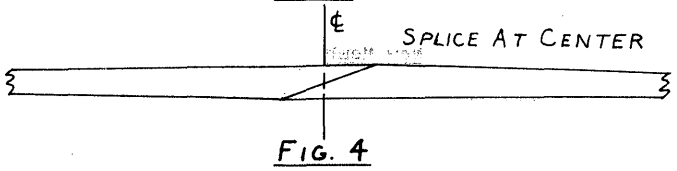


FIG. 4

The blade outline should be made from wood which is uniform along the entire length of the strip. It is best to choose "B" grain wood about 6 lb/cu. ft. density so the outline will be springy. Make the outlines in pairs, using strips which were adjacent to each other in the wood they came from. If the strip is square in cross section, be sure the strips are turned the same way while forming the outline. If the corner of the sheet is bevelled as shown in Fig. 5, each strip you cut will have a bevel to show how the strip came off the sheet.

The outlines customarily are formed in pairs around a form as shown in Fig. 6. Soak the strips in warm water, anchor one end of both strips with a pin and a pad of balsa to avoid crushing the strips, and pull the pair of strips around the form. Be sure to maintain tension on the strips - if you relax the tension as the strip bends around a curve, it will kink. Secure the strips to the form in several places and allow to dry.

Prop ribs should be matched closely in size, and then cut to length in pairs. A small plastic box is handy to store the second rib of each pair while you build the first blade.

When the prop is assembled on the block, the outline should be wet again and allowed to dry to set the helix before the outline is glued to the ribs.

Although matched outlines and ribs help maintain good uniformity between the prop blades, the block should have small balsa scraps just outside the outline to help hold the outline in the proper place (see Fig. 7).

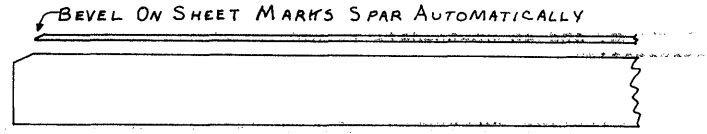


FIG. 5

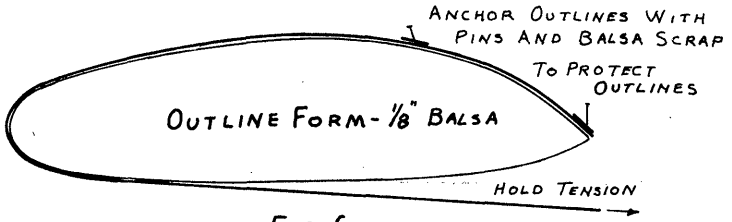


FIG. 6

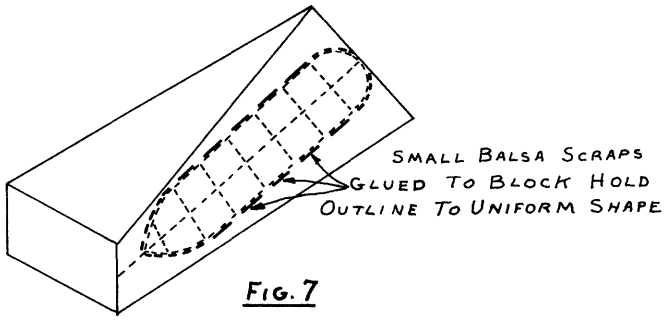
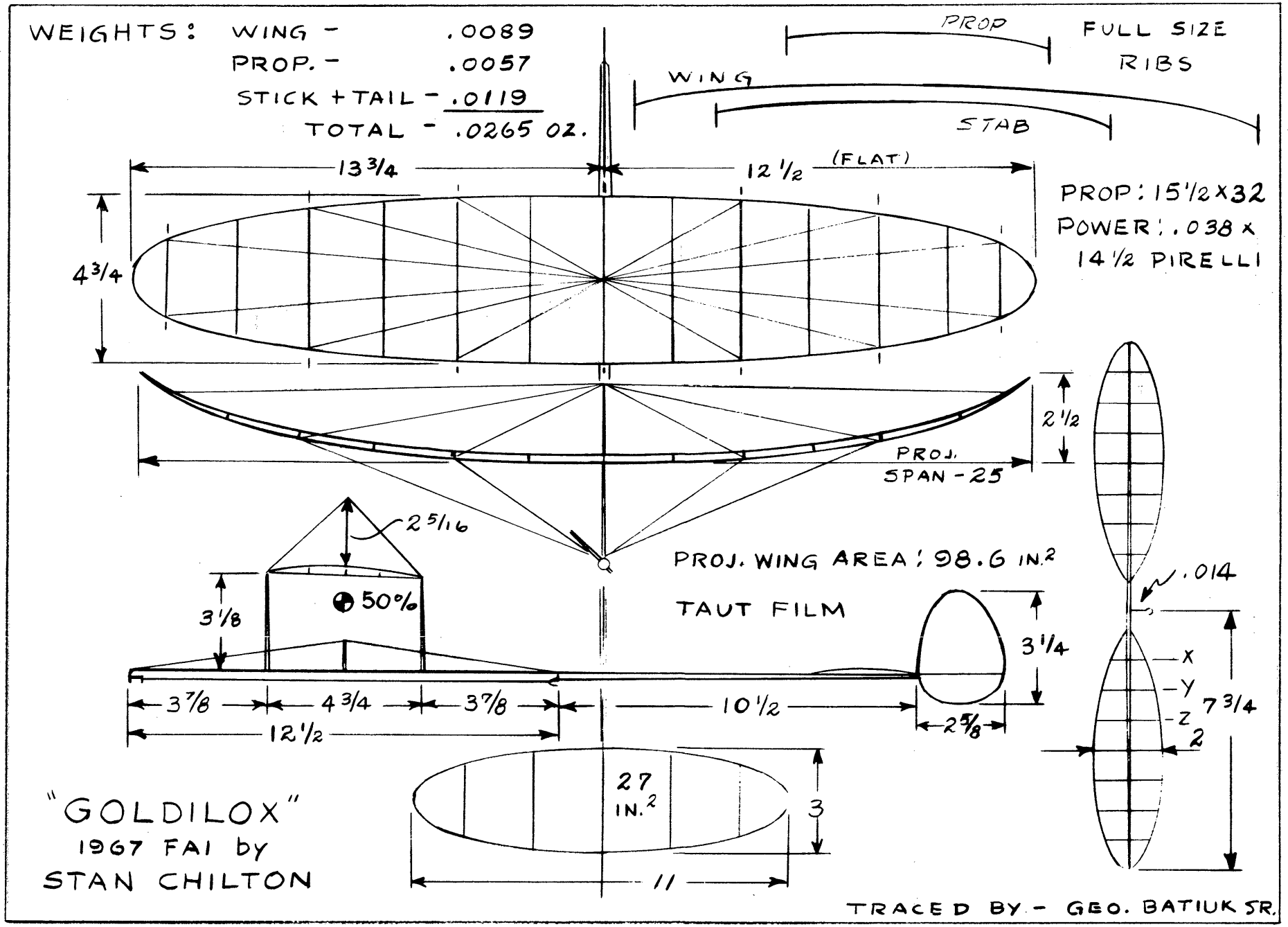


FIG. 7


WEIGHTS: WING - .0089
PROP. - .0057
STICK + TAIL - .0119
TOTAL - .0265 OZ.
PROP
WING
STAB
FULL SIZE RIBS
13 3/4
12 1/2 (FLAT)
4 3/4
PROP: 15 1/2 X 32
POWER: .038 X 14 1/2 PIRELLI
2 1/2
PROJ. SPAN - 25
2 5/16
3 1/8
50%
PROJ. WING AREA: 98.6 IN.2
TAUT FILM
3 1/4
.014
X
Y
Z
7 3/4
2
3 7/8
4 3/4
3 7/8
12 1/2
10 1/2
2 5/8
27 IN.2
3
11
"GOLDILOX"
1967 FAI by
STAN CHILTON
TRACED BY - GEO. BATIUK SR.

INDOOR PROPS - THEORY

Recap - Part 1

Comments from readers about a portion of Part 1 show that a clarification of the definition of pitch would be beneficial. That is, the statements made were correct, but didn't tell the whole truth! The following definitions may state the case better:

1. Effective pitch = The distance the model moves forward during one revolution of the propeller. (Fig. 1, Part 1)

2. Design pitch = The distance the propeller would move in one revolution if it were operating in a solid substance with no slippage. This equates with the basic definition of pitch shown in Part 1: Pitch = 3.14 x Dia. x tan Blade Angle, but the derivation was omitted. In Fig. 1 below a blade element at radius r moving with no slippage would generate a helix as shown. Fig. 1b shows the relationship of elements of the prop and helix; the hypotenuse of the triangle represents the helix, the base of the triangle represents the circular path at radius r and the third side represents the distance moved by the prop (pitch, by the definition). Angle α is the blade angle, and by using trigonometric relationships the pitch can be determined from the blade angle. This same relationship is diagrammed in INDOOR PROPS - PRACTICE (page 2, Nov. '67 INAV) as part of the prop block discussion.

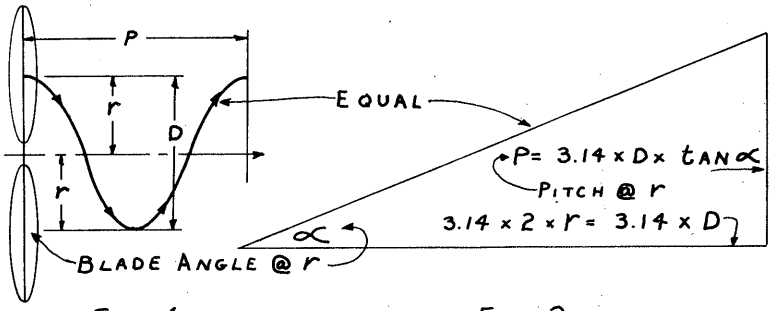


FIG. 1 FIG. 2

It should be noted that effective pitch can also be defined in terms of velocity and propeller speed:

$$\text{Effective Pitch} = \frac{\text{Velocity (inches/sec.)}}{\text{Prop rev./sec.}}$$

Note that the time parameter (/sec.) divides out, leaving pitch defined in inches/revolution, which is correct.

Another clarification of Part 1: The table of RPM and pitch vs. velocity was figured at a specified radius for a good reason. When you use the method shown in Figs. 1 and 2, adding 7° angle of attack to blade angles at different radii will give different pitches. For example: A prop with 30" pitch has a blade angle of 67.3° at 2" radius and 25.6° at 10" radius. Adding 7° to each gives 45" pitch at 2" radius and 39" pitch at 10" radius.

Next month a study will be made of non-standard pitch arrangements of the type used by San Chilton's model (p.3).

STATE OF THE ART

The Team Selection Program produced many new records, and Stan Chilton's 17:15 (FAI Cat. II FAI) was set during the South Central Semi-Finals. Besides the plan on page 3, there is a picture of the same design on page 5. This model has several features which depart from standard practice; from personal observation I can say the model showed much greater potential than the clock allowed.

One's first impression is that the film (Stan calls it "wrinkle free") is standard taut film. This film (more info in microfilm series to come) is German-type formulation which "oozes" into a wrinkle-free state and it is not heat-shrunk as is common U. S. practice. The next departure is the thin airfoil with accentuated entry and exit curve - good in theory but not quantitatively proven. The final deviation is a non-standard pitch distribution of the type mentioned in the prop article in this issue. Stations "x", "y" and "z" shown on the prop drawing have been reduced in angle by arbitrary amounts; again this is not quantitatively proved. The apparent effects of this type of modification are: 1. Climb prolonged because the torque required for level flight is less (less power lost in high blade angles?). 2. Prolonged cruise for the same reason. 3. More turns possible because smaller cross section rubber is needed to turn the prop. The penalty (nothing is free!) is higher RPM average. Only a detailed comparison will prove if this is a good approach!

HINTS AND KINKS

Flying Accessories

Several past issues of INAV have shown devices called winding gadgets. The principle of operation is to have a device anchored firmly with a C-clamp; a wire hook on the device holds one end of the motor during winding. When you are ready to hook the motor to the model, the hook is permitted to turn. This releases a few turns so you have a loop to hook easily to the model. The simplest gadget shown was one designed by Fred Weitzel; Fig. 1 below shows a modification of Fred's device. In operation, this is how it goes: Slide the trigger back to lock the shaft. Place the model on a stand within easy reach. Hook the knot end of the motor to the shaft and wind the motor in the normal manner. Grasp the motor close to the winder hook with your right hand and let out a few turns to form a loop. Lift the model across with your left hand, holding it by the prop shaft. Hook up the motor. Grip the other end of the motor next to the knot and trip the trigger with your little finger, allowing a few turns to run out. Transfer the motor to the model and launch it.

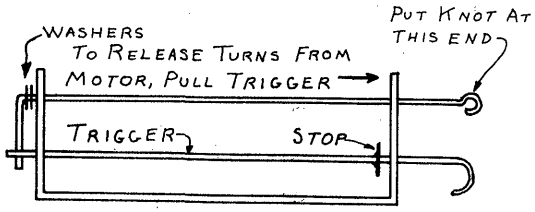


FIG. 1

Fig. 2 shows Jim Richmond's torque stooge. The shaft from Fig. 1 is replaced with a torquemeter which will turn when the catch is released. The operation is the same as above, except that Jim can check the torque of the motor as he winds up.

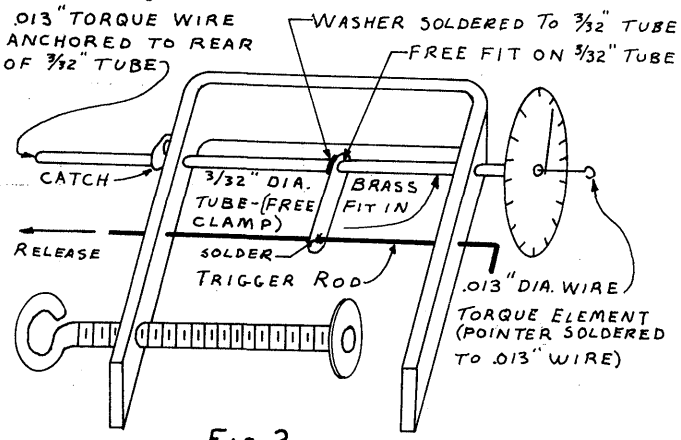


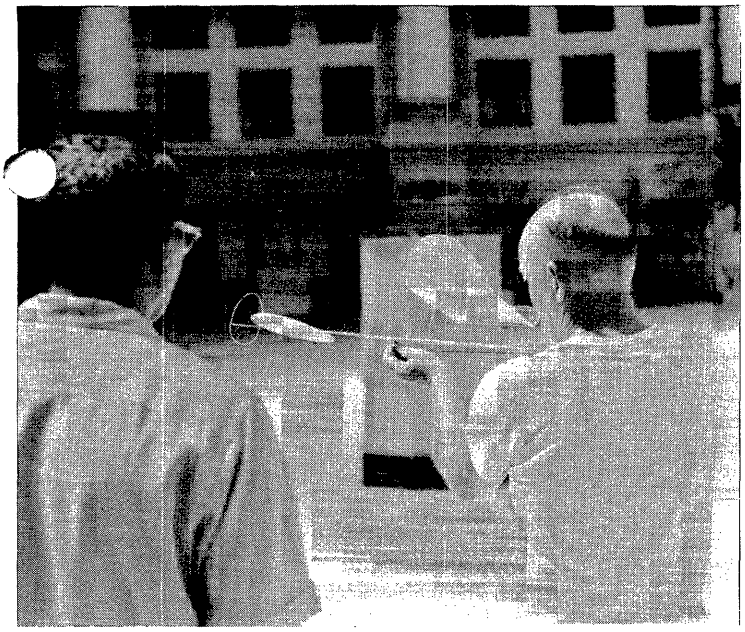
FIG. 2

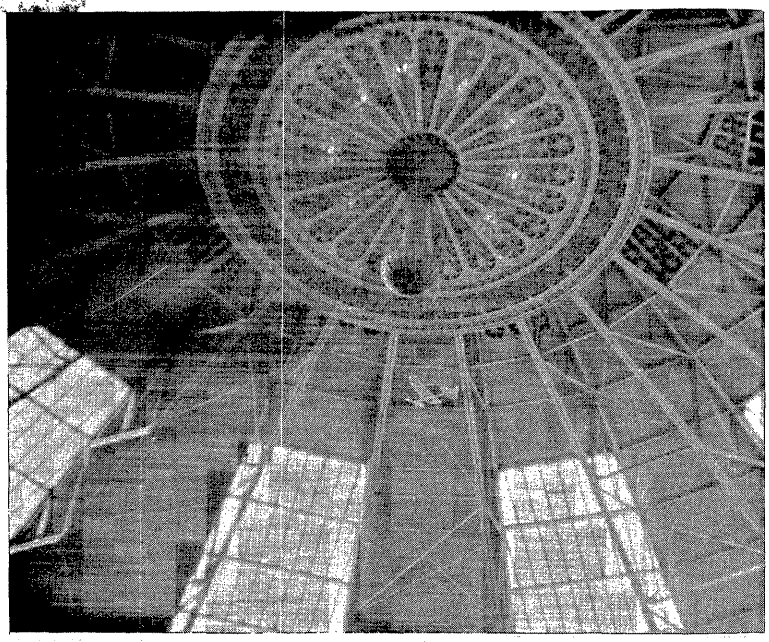
THE LAB

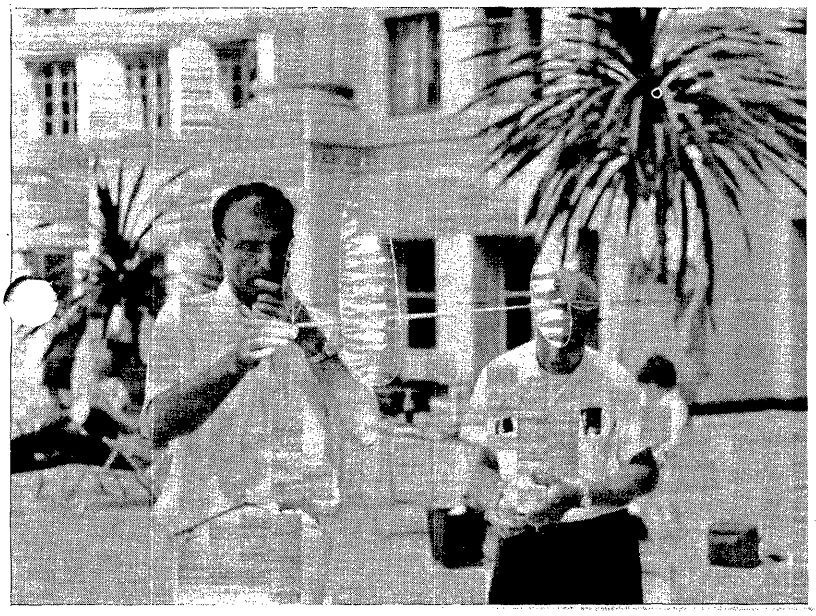
Recording Flight Parameters

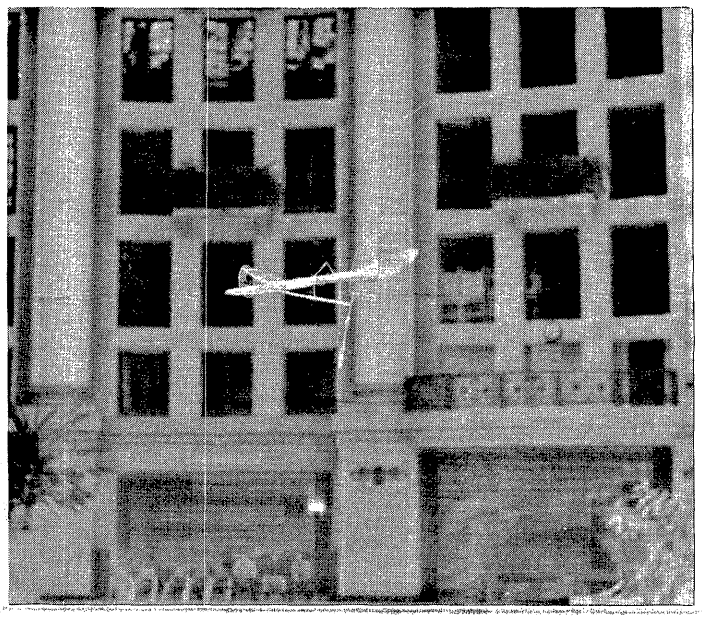
While practicing what I preach about taking flight profiles, I discovered that it takes enough time to write down the resulting figures that other measurements are missed. The following shortcut helps: Use a tape recorder and call out the numbers to be written down and processed later. A typical session would go thus: Wind the model and call out the number of turns. Launch the model and start one watch. Each time the model passes the point of launch, read the first watch and call out the time. As you finish that reading, begin timing ten revolutions of the prop and call out that time. If your site has a tile floor, you can have a friend count the tiles between opposite sides of the flight circle. Altitude information should be taken at the time the model passes the launch point and called out after the time. When you play back the tape, you will have elapsed time for each circle to get average velocity (remember to check circle diameter) for each circle, and RPM and altitude once each circle. That's all you need for the profile - if trying to keep it all straight gives you a headache, get more help; the tape recorder is still a valuable tool!

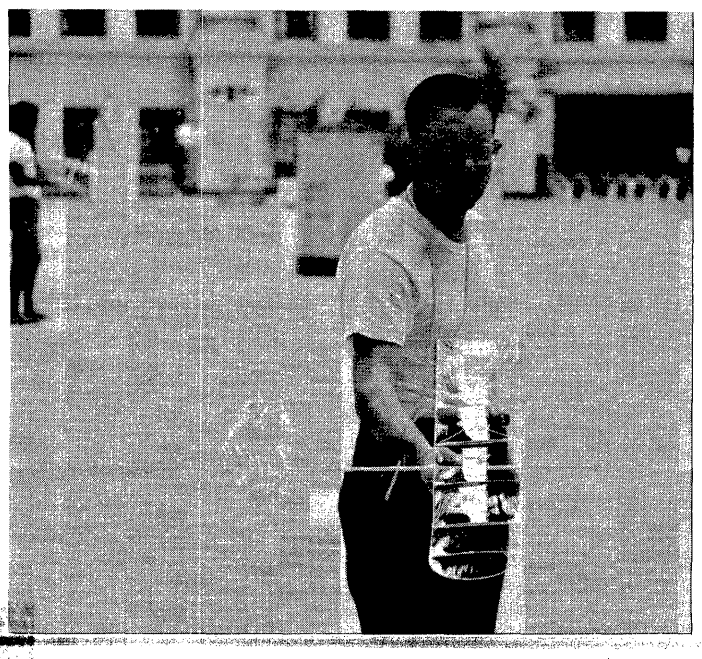
If you make any flight profiles, please send a copy to Bud Tenny, Box 545, Richardson, Tex. 75080. With more of this type of info, a serious study of prop efficiency can be made.







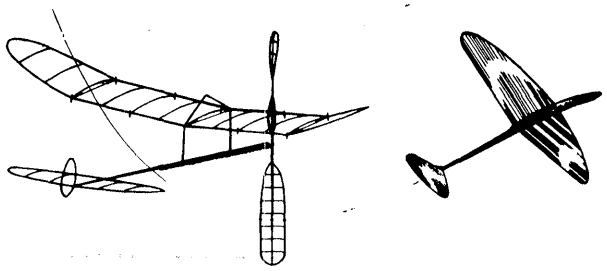




West Baden FAI Team Selection Photos by Ed Capogreco, St. Louis

The Voice of N.I.M.A.S. JAN·1968

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

DANIEL G. BELIEFF, 204 Cedar Lane, Rockville, Md. 20851
ROBERT J. DUNHAM, 4730 S. Yorktown Ave., Tulsa, Okla.
ROBERT J. DUNHAM II (Family Member) 74105
LARS GIERTZ, 11703 N. Willow Cir., Houston, Tex. 77071
ALEX GODA, 329 East 83rd St., New York, N. Y.
JIM KUTKUHN, 517 Georgetown Rd., Wallingford, Pa. 19086
ROGER SCHROEDER, 4111 W. 98 St., Overland, Park, Kansas
JOHN A. THORNHILL, 3334 Buchanan St. Apt. 103, Mt. Ranier, Md. 20822

Back Issues?

The recent postal rate increase raises the cost of mailing the current crop of back issues to 75¢. NIMAS members who wish a set of back issues (approx. 25 issues) can send the 75¢ (stamps preferred) and receive most of the issues from 1966 and 1967, plus 8 from 1965.

NIMAS Awards

Silver Cat. I HLG Award - 0:26.5, Jim Clem

Gold Cat. I HLG Award - 0:30.8, Dick Ganslen

Gold Cat. II HLG Award - 0:58.4, Dick Ganslen

A study of contest results listed in INAV yielded a list of over 15 NIMAS members who had qualified for one or more NIMAS Awards, but had not applied for them. And then there are those who have applied and not received their Award - sorry about that! There simply has not been time to make up the most recent ones - I hope to get to it in a few weeks.

NIMAS Aces

Last month's announcement of Hal Crane's Ace Award contained two mistakes: Hal Blubaugh won three Awards, but one was for glider. Also, Hewitt Phillips became a Cat. I Rubber Ace in April, 1967.

SPREAD THE WORD!

The Allegheny Model Aeronautics Council (Pittsburgh, Pa. area) held a Delta Dart contest recently. This was a brand new concept - contestants were children who visited a local shopping center which had a mall for flying. The entry fee was 25¢ (this gave them a one-day membership in AMA - a special deal where kids are covered for that day by AMA insurance for any event except those powered by engines larger than .049) and they were given a delta Dart kit. Members of the Council conducted building classes to help the kids get airborne, and gave flying demonstrations before the contest. Needless to say, this got a bit of publicity for the Council (they already are very active publicity-wise, since TV and radio stations let them make special demonstrations), and acquainted many more kids with modeling. A good idea!

CONTEST CALENDAR

MARYLAND - Wheaton. D. C. Maxecutors sessions at Kennedy High School - 7 pm to 11 pm, Jan. 26, 1968. Tom Vallee, 444 Henryton So., Laurel, Md. 20810 Phone 498-0790.
NEW JERSEY - Union. Indoor sessions, Franklin High School, Union, N. J. 7 pm to 10 pm. Feb. 15, March 21. Ernie Kopecky, 38 Fawn Lane, Watchung, N. J. 07060
PENNSYLVANIA - Philadelphia. Profile indoor scale session, Jan. 22, 1968. Bill Lindsay, 590 Byrn Mawr Ave., Byrn Mawr, Pa. 19010
TEXAS - Denton/Dallas/Ft. Worth. Cat. I Record Trials on Jan. 20, 10 am to 5 pm. Bud Tenny, Box 545, Richardson, Tex. 75080 Phone 235-4035.

FAI INDOOR REPORT

New Steering Rule

The October CIAM meeting revised the balloon steering rule to read as follows:

To prevent a model from colliding with the structure of the building or with other models, a balloon, its line or a stick, two to eight meters long, may be used for three fifteen second periods during any one flight. The fifteen second period shall commence when the steering device first contacts the model, and the contestant may continue steering for the full fifteen second period regardless of the number of intermittent contacts between the steering mechanism and the model. The steering tactic is intended to change the model's direction of flight only.

It is the responsibility of the time-keepers to observe if the use of the balloon, or its line, or a stick by another competitor is likely to foul the model which they are timing, and to warn the user of the balloon or stick accordingly. If, however, a model is fouled by another competitor, the fouled competitor has the choice of another flight.

The source for the above was the December '67 Officer/Club mailing, and the revised FAI Rule Book will be available some time this year from AMA HQ.

INDOOR RULES

On page 46 of the Feb. '68 AMERICAN AIRCRAFT MODELER magazine there is an article which should be read by all indoor fliers. Entitled "New Indoor Rules?", it details the only two proposals now pending before the FFCB which affect indoor rules. You should read this article and then contact the FFCB member from your AMA District. The address will be found on p. 50 of the same magazine. One error was found in the presentation: The sentence just above the bold face heading "Proposal FF-67-A-1" should read, "Proposal FF-67-A-2 would orient the rules toward FAI practice without adopting FAI scoring and model steering." Whether you approve or disapprove of this proposal, be sure to express those views to your FFCB representative as soon as possible. If you fail to express your views, please fail to express your disapproval of the outcome!

RECORDS? MAYBE!

CAT. I RECORD TRIALS, St. Ed's High School, Dec. 10, 1967
Lakewood, Ohio 35' ceiling.
*Jr. AMA Cat. I FAI - 5:28, Linda Randolph
**Jr. C Stick - 7:58.6, Linda Randolph
CAT. I RECORD TRIALS, Texas Women's Univ. Dec. 23, 1967
Denton, Texas 31' ceiling (AMA); 26' ceiling (FAI)
*Jr. AMA Cat. I FAI - 8:01, Kristi Tenny
**Jr. C Stick - 8:57, Kristi Tenny
Jr. D Stick - 9:45.4, Kristi Tenny
INDOOR CONTEST, Willis School, Jan. 7, 1968
Hampton, Va. Cat. I 20' ceiling.
Open C Stick - 15:30.2, Hal Crane

* & ** Linda's two records were set on Dec. 10, Kristi's followed on Dec. 23. Presumably both will be allowed, with the later records standing.

NEWS FROM AROUND THE WORLD

HUNGARY

On Sept. 9 the Hungarian Aero Club held a Cat. II R.T. in a 14.9 m site in Budapest. The previous FAI record (Hungarian National record) was held by Zoltan Oscody at 18:48. Andras Ree made 19:07, but Geza Varszegi's best flight was 20:00 for the new record. A planned Cat. I session was called off because of strong drift in a small site.

STATE OF THE ART

"Micro-Bird" by Fred Weitzel

Carl Goldberg's 4:05 record was the challenge. It had stood for 26 years, and seemed unattainable.

However, we had a new, light model, which had given a four minute flight at the previous session, so things looked promising. At that time the model had a very wide flapping arc, which gave a slow rate-of-flap that looked impressive. However, subsequent tests indicated that a narrow flapping angle might be more effective overall.

So the narrow flapping angle was used on June 11, and results were even better than expected, with 4:30.5 resulting on the first full wind-up. Fortunately this was an official flight, because on the next launch a spar snapped and the model shook itself to pieces in typical ornithopter fashion. (You just don't have minor accidents with these birds! - - and you don't get second chances either.)

Basically the design is the same as "Birdnik" (Nov. '65 INAV). The main difference is lighter construction, with mike wing and tail and more extensive bracing.

Actually it is a simple type to fly. Since there is no torque, turn can be in either direction. The model is not sensitive to power and can climb at a steep angle without stalling. So, the proper adjustment can be found quickly; after that it is simply a matter of "wind to the hilt and launch."

Of course, there are complications, mostly of a constructional nature. These are pretty well detailed on the plan. Dacron wing braces from the wing tips to the motor stick (fore and aft) were used but are not shown on the plan.

INDOOR PROPS - PRACTICE

Part III - Covering

One of the more difficult tasks in building good props is covering the finished framework. It is quite easy to distort a well-built prop while covering it, so the blades should be covered one at a time and then placed back on the building jig to dry thoroughly. Some builders then use heat to tighten the film on each blade before removing it, further insuring an undistorted blade. As usual when heat-tightening film, you should use considerable care to avoid over-tightening.

Probably the most common way to cover props is shown in Fig. 1 below. The entire blade except the spar is moistened with water or saliva (saliva sticks better and dries slower) and the blade trailing edge is stuck to slack film on a hoop. The film next to the trailing edge is then trimmed loose to permit the rest of the outline and ribs to touch the film. This takes a light touch to avoid stressing the blade and a steady hand to avoid pulling the blade loose while trimming the film. To repeat: immediately place the wet blade back on the block to dry thoroughly before covering the other half of the prop.

Fig. 2 shows a prop covering frame. When building it, spread the ends at "A" while attaching the silkspan strip. This permits the silkspan to slacken when the frame relaxes. To cover the frame, squeeze the "handles" ("B") to tighten the silkspan; use rubber cement adhesive and aged microfilm. When the frame is cut loose, the frame will relax and slacken the film to make covering easier.

Fig. 3 details a prop covering fixture designed by Harry Lerman. The drawing and text is self-explanatory, and the device is quite good as long as the fixture is covered with very loose film.

Fig. 4 shows a modification to Harry's fixture which greatly eases the problem of slackening the film. Instead of covering the fixture on the bottom, install two strips of heavy silkspan across the top of the fixture, and cover it on top using rubber cement as adhesive. Thus, when the helix is twisted in (step 3, Fig. 3), twist the right hand dowel counterclockwise to slacken the film (Fig. 5)

A special vote of thanks to Harry Keshishian for making the photographic positive used in Fig. 3 and Fig. 4.

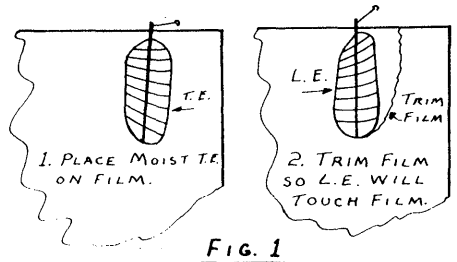


FIG. 1

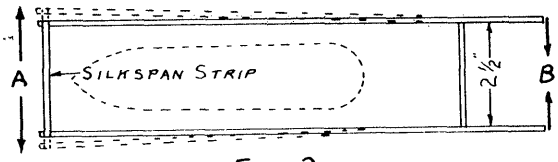
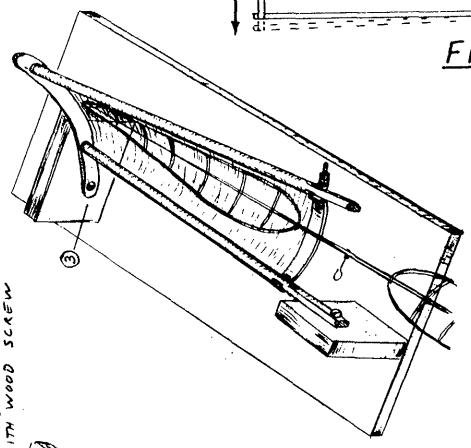


FIG. 2



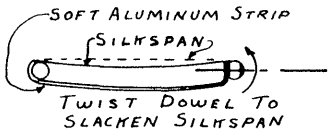


FIG. 5

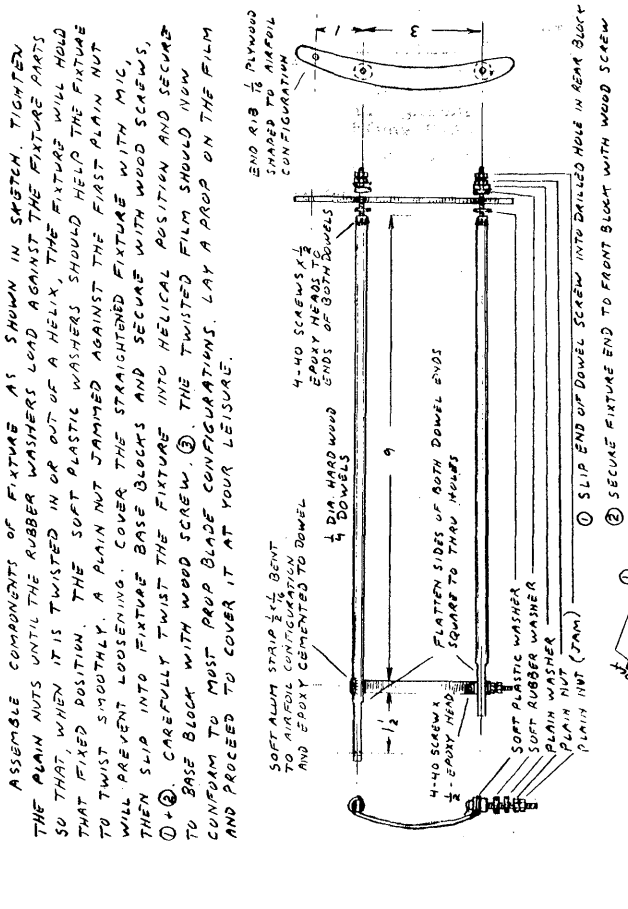


FIG. 3

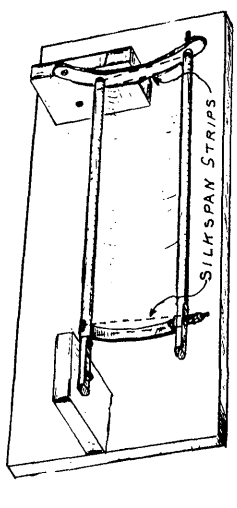
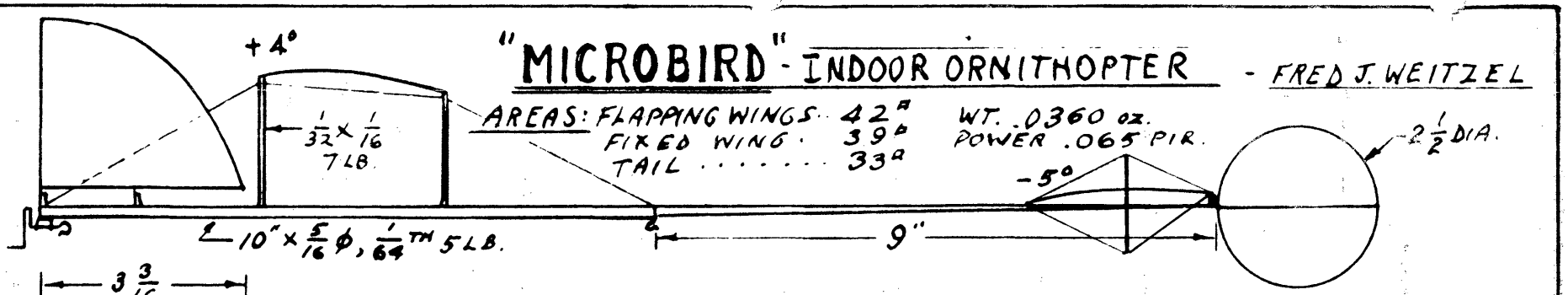


FIG. 4

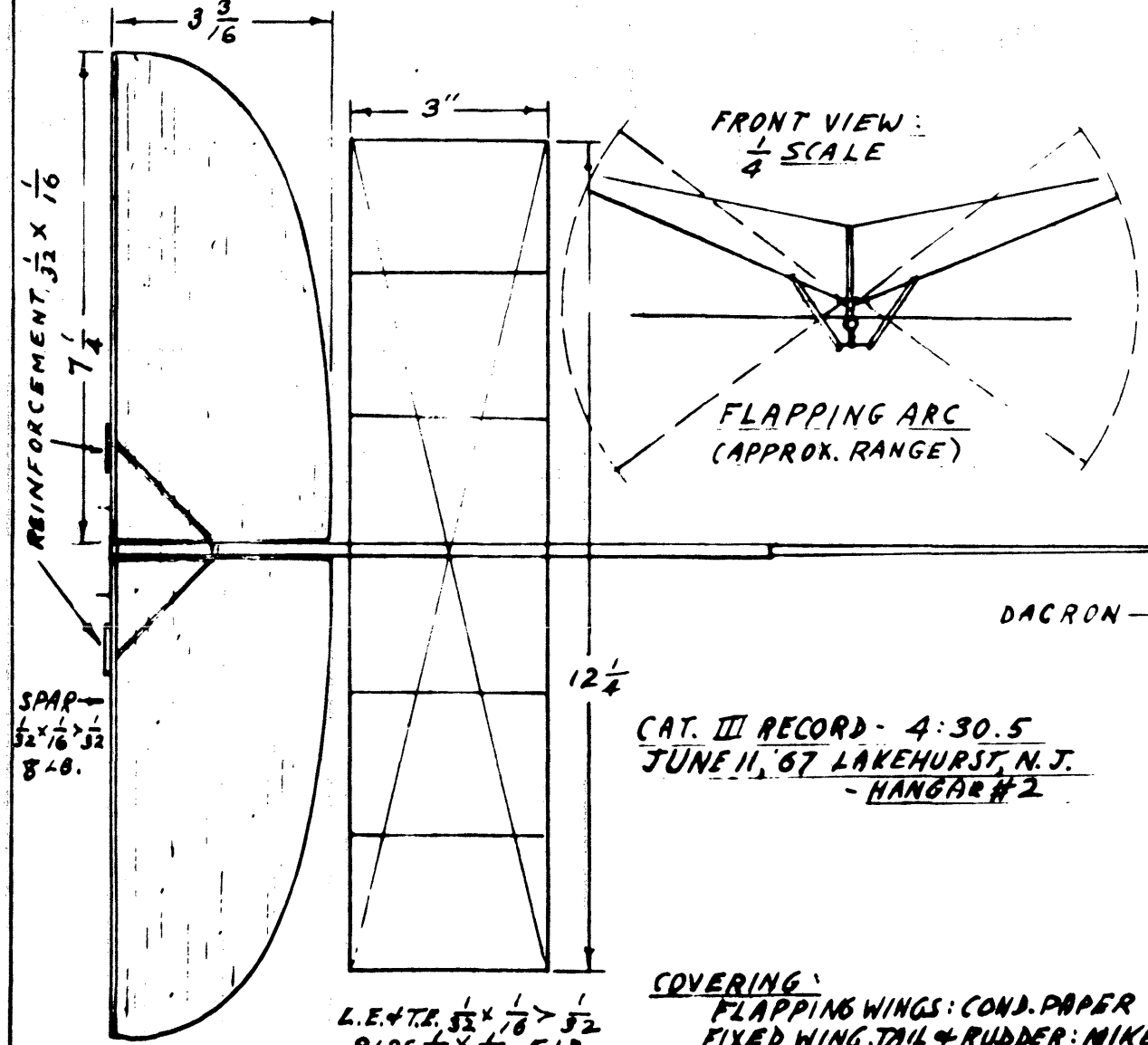
"MICROBIRD" - INDOOR ORNITHOPTER

- FRED J. WEITZEL



AREAS: FLAPPING WINGS 42 in²
FIXED WING 39 in²
TAIL ..... 33 in²

WT. .0360 oz.
POWER .065 PIR.

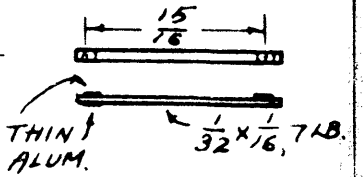


CAT. III RECORD - 4:30.5
JUNE 11, '67 LAKEHURST, N.J.
- HANGAR #2

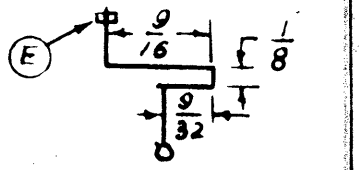
COVERING:
FLAPPING WINGS: CONT. PAPER
FIXED WING, TAIL & RUDDER: MIKE

DETAILS: FULL SIZE

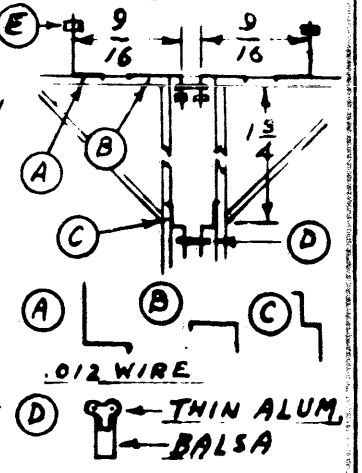
LINKAGE ARM:



CRANK - .015 WIRE



FLAPPING WING MOUNTING:



(E) BALSA CHIP - CEMENT ON AFTER ASSEMBLY.

- FJW '67

INDOOR PROPS - THEORY

Part II - Theoretical Considerations

Part 1 and the clarification above dealt with the "ideal" prop; that is, with a prop having constant pitch from hub to tip. The props we fly actually have the blade area beginning some distance out from the hub for practical and structural reasons. The discussions to follow deal with deliberate deviations from normal practice in a search for higher efficiency.

The following prop design discussion comes from Larry Renger (graduate of MIT in aero engineering). In Fig. 3, he shows a blade element located at radius r from the hub. The legends on the force vectors are: D = Drag, T = Thrust (thrust output of prop), L = Lift (of the blade element), V = velocity of the blade element and τ = Torque.

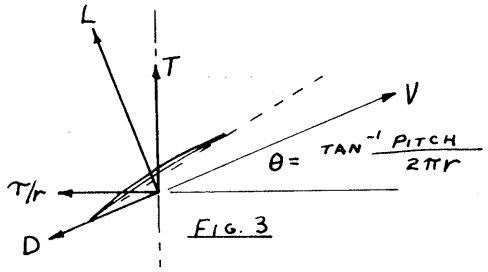


FIG. 3

(1) T (Thrust) = Lift(cos θ - D/L Sin θ)

(2) τ (Torque) = r x Lift(D/L cos θ + sin θ

(3) $\frac{T}{\tau} = \frac{\cos\theta - D/L \sin\theta}{r(D/L \cos\theta + \sin\theta)}$

(4) $\frac{T}{\tau} = \frac{1 - D/L \tan\theta}{r(D/L + \tan\theta)}$

In the mathematical discussion above, equations 1 & 2 (derived from Fig. 3) are combined to yield eq. 3. It can be shown that (3) can be simplified to yield (4). D/L is estimated to be about .2 for normal indoor props. Using .2 as a value for D/L, a plot of T/τ can be computed using Eq. 4. Fig. 4 shows T/τ for a 34" pitch prop (solid line) and a 30" pitch prop (dashed line).

The ratio T/τ expresses directly the efficiency of the blade element, so Fig. 4 shows that prop efficiency gets better with lower pitch. It also shows that elements near the hub contribute little to thrust; in Fig. 3, if θ increases to a very large angle, Thrust as expressed in eq. 1 actually becomes negative - effectively it is pure drag for the model. This means that the prop will be more efficient if the hub section is left off.

Meanwhile, prop efficiency can be increased by lowering the value of D/L. Larry estimates that D/L might go as low as .1; Fig. 5 shows the variation of T/τ for a 34" pitch prop as D/L chages from .2 (solid line) to .1 (dashed line). Larry feels that a D/L of .1 might be achieved by covering both sides of the prop. Once again, I have heard of double covered props being tried, but flight profiles were not taken. Since reduction of D/L results in higher efficiency of the propeller (as shown in Fig. 5), the prop will do the same work at lower torque input. So, a smaller rubber cross section will do the same job and you gain two ways - more turns possible and lower wing loading of the model. That's the theory - try it out!

Larry's design procedure calls for a horizontal intercept with the T/τ plot to determine prop diameter and blade length as shown with line "A" in Fig. 4. Line "A" would yield a prop with diameter 17" and a stubby blade segment only 3½" long. Quite possibly this would give a prop with insufficient blade area. Line "B" would give a 19" dia. prop with a 5" blade segment - considerably more area. Of course you can use a tilted intercept such as line "C"; the whole point of this exercise has been to minimize the high-loss blade area near the hub.

Fig. 6 illustrates the theoretical effect of reducing blade angle near the hub. (This concept, plus the idea of eliminating blade area near the hub, was discussed in the July '63 INAV. No really exacting test of either concept has been made, but Stan Chilton, Hardy Brodersen and others flew props with the modified pitch distribution in the FAI team selection program just recently finished.) The three curves in Fig. 6 represent successively lower pitches - 34" (solid line); 30" (short dashes); 26" (long dashes). The curve for 34" pitch breaks downward beginning at 4" radius, while the other curves break closer. The dashed horizontal line represents a T/τ characteristic that would be nice to have; the x's represent the vertical coordinates necessary at 3" and 2" radius. It might be logical to assume that if the prop were 34" pitch from the tip to the 4" station, 32" pitch at 3" and 28" at 2" radius; then the composite characteristic might follow the desired curve. It certainly is worth a try - so practice recording flight profiles and try it!

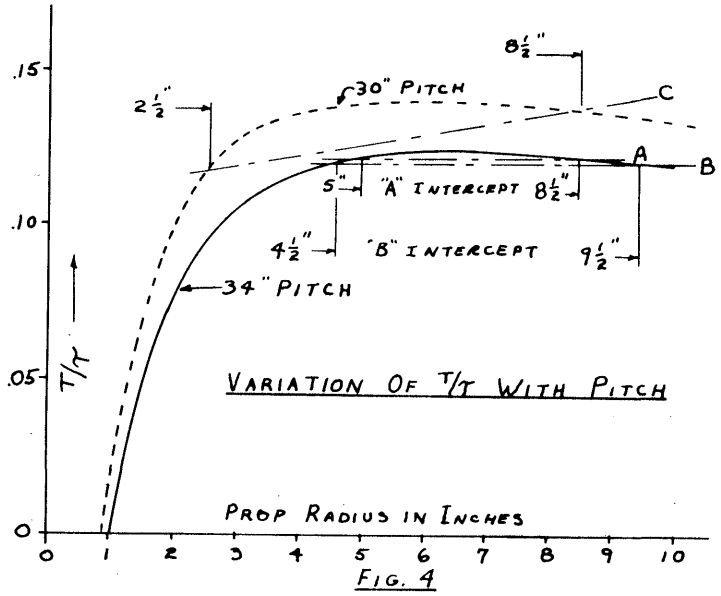


FIG. 4

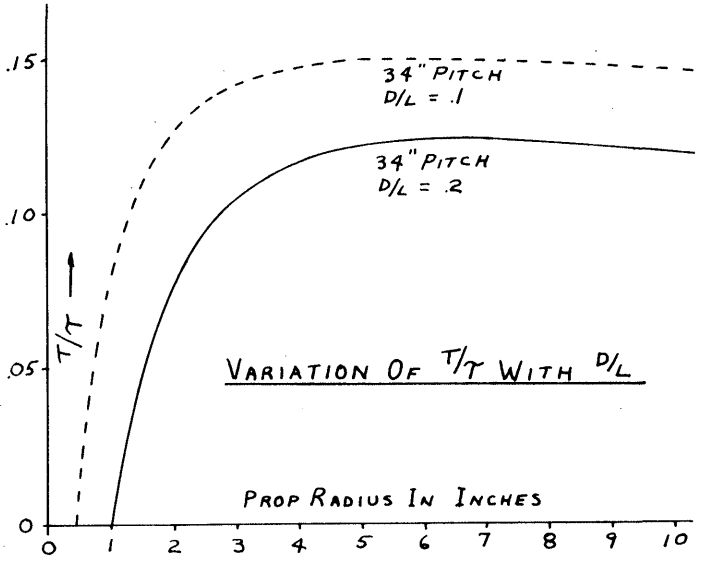


FIG. 5

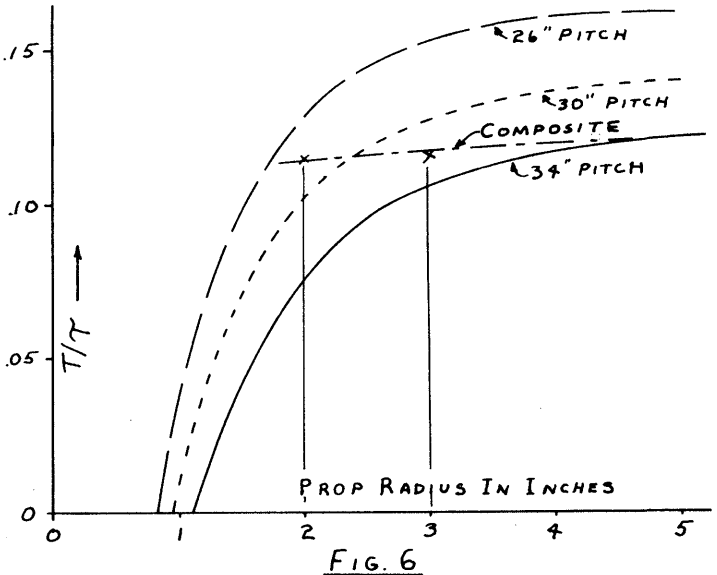
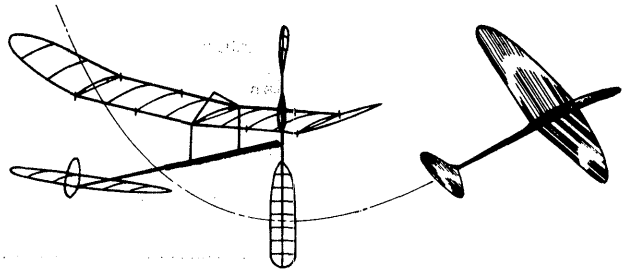


FIG. 6

The Voice of N.I.M.A.S. FEB·1968

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

JAMES H. BENNETT, 324 Helfenstein Ave., Webster Groves, Mo. 63119
MICHAEL D. COULSON, 1752 Hobson Rd., Ft. Wayne, Ind. 46805
GUY EAVES, JR., 3232 Leslie Lane, NE, Atlanta, Ga. 30329
FRANK LITTLETON, 1832 Bimini, Seabrook. Tex. 77586
TOM MURRAY, 365 Bay St., Room 800, Toronto 1, Ont. Canada
A. E. SORTWELL, 1036 Maple, Elk Grove Village, Ill. 60007
JIM TEMPLETON, 1 Gemini Rd., Willowdale, Ontario, Canada

Thank You, Good Friends!

Last week, Jim Clem and Dick Ganslen dreamed up some sort of flimsy excuse (I should have been suspicious, since no excuse is needed for modelers to visit here) to drop in for a visit. After a certain amount of nervous suspense, they produced a pretty little speech and three packages. These mysterious packages contained a dial indicator caliper, an engraved Guinard stopwatch and a Hamilton Beach blender. The inscription on the watch told the tale: "In Appreciation - Ralph Tenny - Indoor Model Builders The World Over." The blender was a reward for Jody's outstanding patience and help (it is quite wearing to be the wife of a newsletter editor) over the past years

Thank you, each one of you. Dick and Jim were afraid at one of you might have dropped a hint - it was a total surprise and a very humbling moment - and will be remembered as long as I live. Special thanks are due to Jim and Dick and their wives for their planning and organizing this moment, and thanks again to all of you.

Nats Help Needed

Increased commitments to the Vietnam conflict are causing the U. S. Navy to request additional help from AMA to run the Nats. The National Free Flight Society and NIMAS have been asked to host Free Flight and Indoor events. Pending approval by HQ, we have directors for Indoor Rubber and Indoor HLG. Help is needed in all FF events (indoor and outdoor) as processors, recorders, and many other necessary tasks unknown to the average entrant. Any NIMAS member who plans to attend the Nats should consider helping on one or more days. All those who can help send NIMAS your name and indicate events where you feel qualified to help. The entire program will be coordinated through NFFS, for best management of manpower. It is not necessary to hold a CD license to help, even as event directors. Incidentally, it is likely that the Nats will be during the week of Aug. 5-10. The number of days allotted will be decided sometime this month. Info on the Indoor site should also be available for the March issue.

NIMAS Awards

Silver Cat. I Rubber Award - 11:59, Bob Champine

Junior NIMAS Awards

Silver Cat. I Rubber Award - 8:57, Kristi Tenny

Gold Cat. I Rubber Award - 9:45.4, Kristi Tenny

NIMAS Aces

After two goofed-up attempts to name the present NIMAS Aces, perhaps this will be correct and complete: Hal Crane Hewitt Phillips, Bob Randolph and Bud Romak.

INDOOR RULES

Indoor fliers are reminded that final vote will soon be taken on FF-67-A-1 and FF-67-A-2, proposals which will effect reasonably large changes in the structure of the indoor rules if they pass. Refer to p. 46 of the Feb. '68 AMERICAN AIRCRAFT MODELER for details of these proposals. An error in text appears on p. 50: The sentence just above the bold face heading "Proposal FF-67-A-1" should read, "Proposal FF-67-A-1 would orient the rules toward FAI practice without adopting FAI scoring and model steering." This proposal, if passed, will have a direct effect on your indoor activity. Contact your FFCB representative and express your approval or disapproval of these proposals as soon as possible. If you fail to make your views known, you have no complaint since you offered no guidance to the FFCB member.

NIMAS POSTAL MEET

Favorable comments on the rules for the Annual NIMAS Postal meet (formerly limited to Easy B) have resulted in the following setup:

Easy B event - Rules for model p. 78, '68 Rule Book.

HLG event - AMA Rules except two ceiling classes: Cat. IA - 18' to 25'; Cat. IB - 25' to 35'.

Rubber Event - AMA Rules except for ceiling measure. All model sizes combined.

General Rules: Enter (postmark) before March 31, '68. Entry fee 15¢ per event, stamps preferred. Separate events may be flown at different sessions, all flights for any single event must be made same session. Special events for Juniors, all other ages combined. NIMAS Certificates through 3rd place each event, special award for Juniors and high placing Seniors.

Ceiling measure: HLG - AMA (Sec. 8.21, p. 14, '68 Rule Book). Easy B and Rubber - FAI measure (p. 56, '68 Rule Book. Include ceiling measure with each entry.

Scoring: All results corrected to highest ceiling via NIMAS Fudge Factor: ratio of ceiling height for HLG, Square root of ratio of ceiling height for Rubber and Easy B events.

Send entry and result sheet signed by AMA member or AMA CD to: Bob Putman, 507 Darlene, Arlington, Tex. 76012

POSTAL CHALLENGERS

Bill Gibbs, 5005 Halifax, Cypress, Cal. 90630, would like to challenge other Juniors in Cat. I HLG, Indoor Stick and Cabin. Has choice of 25' (AMA) and 28' (AMA) sites.

CONTEST CALENDAR

COLORADO, Denver. Magnificent Mountain Men Indoor Contest. Feb. 11, 1968 , Aurora Central High Gym, Aurora, Colorado. Stick, Paper Stick, HLG, Scale, Easy B and Delta Dart (Jrs. only). Ed Collins, 4318 E. Utah Pl. Denver, Colo. 80222

GEORGIA, Atlanta area. Easy B contest. Walt Rozelle, 1403 Midlawn Drive, Decatur, Ga. 30032 (Feb. 11, 1968)

NEW JERSEY, Union. Indoor sessions, Franklin High School, Union, N, J. 7 pm to 10 pm. Feb. 15, March 21. Ernie Kopecky, 38 Fawn Lane, Watchung, N. J. 07060

PENNSYLVANIA, Pittsburgh. 4th Annual Allegheny Indoor Air Meet, March 31, 1968. Delta Dart, HLG, Prefab, Easy B, Indoor Stick/Paper Stick, Scale, Originality & Performance. 5 age groups. Ron Ganser, 2500 Mission St., Pittsburgh, Pa. 15203

TENNESSEE, Tullahoma. Coffee Airfoilers Class AA Indoor Meet, Cat. I. Feb. 18, 1968. HLG, Paper Stick, Scale, Indoor Stick. Separate classes for Juniors. J. H. Perdue, 603 Crestwood Dr., Tullahoma, Tenn. 37388

TEXAS, Dallas/Denton/Ft. Worth. Cliff Model Club Annual Indoor Contest. Cat. I (31') HLG, Scale, Paper Stick, Indoor Stick (all ages combined); Jetco ROG (Jr, only) Bill Chenault, 5906 N. Jim Miller, Dallas, Tex.

OKLAHOMA - Tulsa. Tulsa Glue Dobbers Monthly Indoor Contest. Feb. 25, 1968. Air Guard Hangar at Tulsa Int'l Airport (56' AMA, 42' FAI). HLG, Easy B, Indoor Stick and Scale. Practice begins 9 am, official flying at noon.
First Annual Tulsa Glue Dobbers Indoor Meet. Mar. 10, 1968. Site pending - Air Guard Hangar hoped for. Contact Bob Hanford, 3838 South 88th E. Ave., Tulsa, Oklahoma 74145. 918-627-6932

INTERNATIONAL CONTESTS

ROMANIA - International Indoor Contest, Salt Mine site. Organizer: Ion Bobocel, Aleea Titus no. 6, Raion N. Balcescu, Bucuresti, RS Romauia. April 4-5, 1968
CZECHOSLOVAKIA, Brno. International Indoor Contest. July 6-7, 1968. Info came from Rudolf Cerny, Sumavska 22, Praha 2-Vinohrady, Czechoslovakia.

INDOOR ELSEWHERE

Czechoslovakia has chosen their 1968 Indoor Team with a series of three competitions. The final score was the total of the results (two flight total) from the best two out of three. The results:

1.	Jiri Kalina	52:50	44:45	97:35
2.	Eduard Chlubny	48:45	40:45	89:30
3.	Juraj Sitar	48:00	39:11	87:11
4.	Karol Rybecky	47:57	36:18	84:15
5.	Dagmar Chlubna	47:58	33:51	81:49
6.	Rudolf Cerny	47:25	30:48	78:13

Kalina, Chlubny and Sitar will be the team, and Rybecky is alternate. The final session (all meets held in the big hall in Brno) was held Nov. 11 with temperature at 9° C. and high humidity. Turbulence and drafts plagued most of the rounds, ruining many models. The results:

1.	Rudolf Cerny	23:30	23:55	47:25
2.	Jiri Kalina	19:20	25:25	44:45
3.	Juraj Sitar	18:54	20:17	39:11
4.	T. Weigert	16:40	19:58	36:38
5.	Karol Rybecky	18:08	17:50	36:18
6.	Stefan Kekely	15:48	19:08	34:57
7.	Dagmar Chlubna	19:45	13:09	32:54

A total of 17 contestants entered the competitions. The very poor weather has caused plans to begin the next team selection series in July. The Czech state of the art is advancing rapidly, with light models (about 125 sq. in. wing area) down to .021 oz.

STATE OF THE ART

The model of the month is the one which placed Eduard Chlubny on the Czech Indoor Team for the 1968 Indoor World Championship. Not many details are available except those on the plans, but average conditions in the hall in Brno dictates that the models must have good gust stability. See above for some contest results of this design.

THE LAB

The Blubaugh Fence

The Feb. '66 INAV contained a flight test report on a modification for IHLG - Hal Blubaugh's trailing edge fence which was mentioned by Bill Gieskieng in the '64-65 Zaic Yearbook (p. 164). A follow-up report in the April '66 INAV gave some added info, and showed the fence having an 8% edge over the same glider without the fence.

Since those reports, other fliers have tried the fence (see sketch below for example) with varying results. Ned Smith has had both good and bad flights, for an inconclusive result. Hank Nixon, flying in a 24' site, was getting between 0:24.5 and 0:26 with one of his gliders; with a fence added his flights ranged between .3 and .8 seconds higher.

Bob Clemens gave a fairly detailed report of his test, which used Larry Renger's "Boxy" (Sept. '65 INAV), built the size shown (2/3 full size). His best time in the 23' site he regularly uses was 0:25.2. He then added a fence which tapered from .05" at the wing root to zero at the tips. Average of the next 10 flights was 0:25.5, with the best flight 0:26.2. His comment on the test: "These times were achieved with very little if any increase in launch altitude, but with much smoother transition and definitely better sinking speed."

After flying the fence for some time, it is apparent that gliders just fly differently with the fence, and it seems that the fence has a definite advantage. I believe that many experimenters have used a deeper fence than is optimum - my present guess is that between .05" and .07" is about right for most gliders. The only other hint I can offer is that the tail boom should be stiff - because no glider with a limber boom has ever flown well for me, if a fence was used also.

TYPICAL FENCE INSTALLATION

NEWS FROM AROUND THE WORLD

OHIO - Cleveland. A severe snow storm made travel rough for entrants. Conditions were the usual - turbulent and drafty. Winners: Paper Stick; Jr. - 7:32, Ronny Ganser, Sr. - 8:55, Mike Thompson, Open - 11:44, Bill Hulbert. Indoor Stick; Jr. - 11:33, Linda Randolph, Sr. - 7:18, Bill Schubert, Open - 12:15, Ron Ganser. HLG; Jr. - 1:25, Ronny Ganser, Sr. - 1:57.9, Bill Schubert, Open - 1:54, Don Eble.

TEXAS - Houston. Indoor activity is under way in Houston with sessions in a gym at Rice University. The group is active and enthusiastic, and should soon be turning very good times.

TEXAS - Dallas/Denton/Ft. Worth. With two record trials (contest on the side) to break in the excellent site at Texas Woman's Univ. in Denton, the fliers are getting the range in HLG. Mike Fedor has led the pack in HLG, with 0:29.5 as best official to date. Brian Ganslen is leading in Junior, with 0:22.8 for his best. Rubber events have been marred by drift due to temperature changes, and an early flight of 8:04.7 by Kristi Tenny won the January event - the air "went south" immediately after. Tom Peadon won second with his first indoor model, beating out Dick Mathis' 5:48.7. Will Dick let Tom build at his house again? Tune in next month!

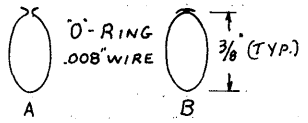
RECORDS? MAYBE!

GREAT LAKES INDOOR AIR MEET - Jan, 13-14, 1968 Cat. II
Cleveland, Ohio. Public Hall, 80' ceiling.
Open A ROG - 14:27.3, Bob Randolph
Open Ornithopter - 3:15.0, Ken Johnson
CAT. I RECORD TRIALS, Texas Woman's Univ. Jan, 20, 1968
Denton, Texas. 31' ceiling (AMA) 26' ceiling (FAI)
Sr. AMA Cat. I FAI - 6:53, Mike Fedor

HINTS AND KINKS

Wire O-Rings

The Mar. '67 INAV hinted that a rubber O-ring slipped onto the motor before tying the knot would simplify hooking and unhooking the motor, besides permitting hook-up without losing turns. Fred Weitzel suggests that small wire can be formed into similar fixtures. The sketch below shows how: form an oval with small hooks, then hook the hooks and squeeze them shut. Relative weights: rubber O-ring - .002 oz., wire (010" wire) - .00045 oz., (.008" wire) - .00035 oz. Very small plastic sleeving 1/4" long slipped on the ring adds .0002 oz; I doubt it helps much, but it makes me feel better!



Teflon Socket Jig

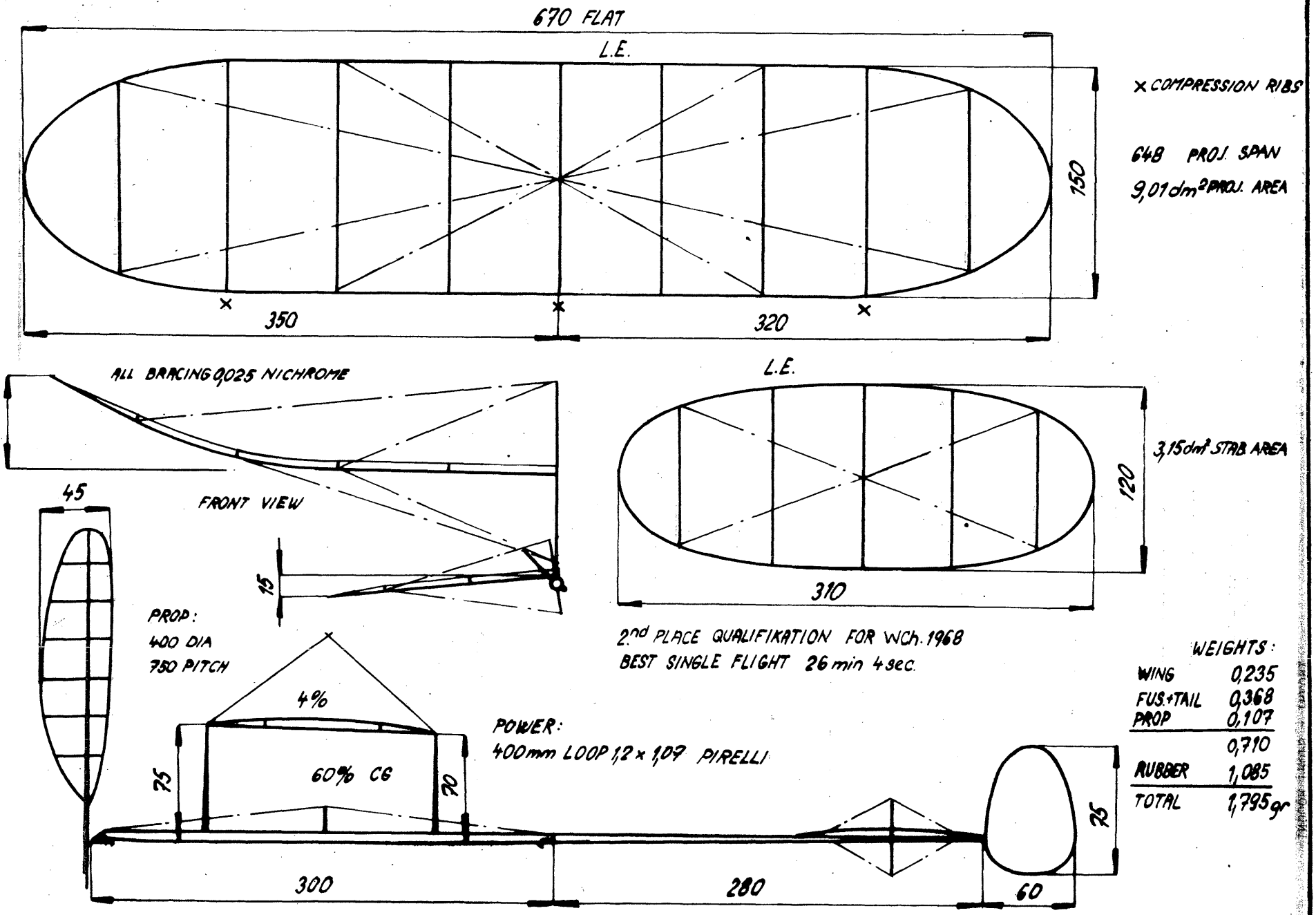
Dick Ganslen suggests that tissue sockets can be made by rolling them on small diameter teflon tubing. Insert music wire or other wire inside the tubing to stiffen it, then roll the socket as usual except let it dry in place. The glue won't stick to the teflon, so the finished socket will slide off later.

Save Microfilm Solution!

Tom Vallee suggests that you save a lot of microfilm solution if you use a small tank when pouring small hoops. This is an excellent approach; if you don't have a small tank and can pour large uniform sheets, several small hoops can be put on one large pour.

LAST MINUTE BULLETIN

AMA HQ has announced that the Nats will run Aug. 3 thru Aug. 8, with Navy airshow Aug. 3 & 4 and flying to begin Aug. 5. Extra flying hours each day are planned.


670 FLAT
L.E.
× COMPRESSION RIBS
648 PROJ. SPAN
9,01 dm² PROJ. AREA
150
350
320
ALL BRACING 0,025 NICHROME
60
45
FRONT VIEW
15
L.E.
3,15 dm² STAB. AREA
120
310
PROP:
400 DIA
750 PITCH
2nd PLACE QUALIFIKATION FOR WCh. 1968
BEST SINGLE FLIGHT 26 min 4 sec.
4%
75
60% CG
70
POWER:
400mm LOOP 1,2 × 1,07 PIRELLI
25
300
280
60
WEIGHTS:
WING 0,235
FUS.+TAIL 0,368
PROP 0,107
0,710
RUBBER 1,085
TOTAL 1,795 gr
1967 FAI INDOOR STICK BY EDUARD CHLUBNÝ BRNO CZECHOSLOVAKIA

INDOOR PROPS - THEORY

Rebuttal To Part II

Several people wrote in with comments on Part II. I am now sure that the series is being read attentively and with appreciation - thank you for all the comments.

Roger Schroeder, Bob Platt and Larry Renger all wrote in to explain that parts of Part II were in error. Each arrived at the same conclusion by a different route - if anyone is interested in the derivation, write for a copy.

The first and major error is that T/τ does not express propeller efficiency directly. The correct expression is:

$$\text{Prop Efficiency} = \frac{T}{\tau} r \tan \theta$$

The general shape of the efficiency curve is similar to that for T/τ, with the same x-axis intercept. The slope of the rising part of the curve is steeper, and the curve rises to a maximum at $\theta = 45^\circ$.

Efficiency is not much different for pitches from 20" to 35", differing by about 2⅛% at 6" radius. Bob Platt's comments indicated that efficiency falls by 10% going from 45° down to 12½° and up to about 73° for D/L = .1. For D/L = .2 the limits are 20° and 60°, approximately.

Paragraph 5 (part II) is correct. Par. 6 is incorrect, in light of Platt's comments above. In the light of other comments all theory presented to date does not support the concept outlined in par. 7 and Fig. 6. Continued good results with props of this type are the only reason for including this approach. In effect: "Hang the theory - it works!"

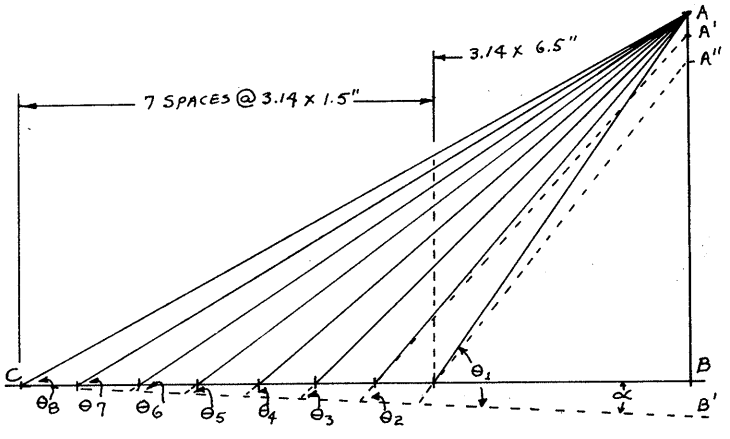
Other criticisms include objections by Walter Erbach. He points out that graphs in Figs. 4, 5 and 6 used fixed prop pitch (pitch of the prop block), which is correct. Either T/τ or Efficiency curves must use effective pitch. The built-in angle of attack changes the pitch required in the block to a higher value. Walter also claims that D/L = .2 is too low to be realized in practice, and has made measurements supporting this stand. Regardless of what value of D/L is obtainable, it is important to reduce this parameter to as low a level as possible to increase prop efficiency.

In summary, the study of T/τ was not wasted, because it underscores the undesirable effect of high blade angle near the hub. Some of the supporting material for this rebuttal will be presented at the end of the series.

An afterthought: Is someone willing to make a theoretical study of prop efficiency as applied to indoor models? That is, everything presented has been, or has followed the lines of standard propeller theory. T/τ has been shown to vary drastically with change in pitch; info is available on the torque/turns variation of pirelli as you change cross section size of the rubber. What is more efficient: A short loop of big rubber turning a high pitch prop slowly or a long loop of thin rubber (same weight of rubber) turning a low pitch prop at some higher RPM? Or, somewhere in between, as we now operate? Just as a truck or car is geared to match the torque curve of the engine and the type of service, is it possible that some combina- of design RPM (and effective pitch) will result in a more efficient energy transfer than we now obtain?

Part III - Graphical Design

The method below has been suggested by Ned Smith and Charlie Sotich, and is the basis for the method used by Hardy Brodersen. The graph is drawn to scale: line AB = Effective Pitch (Recap - Part 1, Dec. '67 INAV) = distance travelled by model during one revolution of prop. Line BC = 3.14 x prop diameter, and the other segments of BC represent 3.14 x diameter of each rib station. The line segments between A and line BC form the effective pitch angle for each blade station. A prop built to this design would have zero angle of attack, so line B'C is drawn with angle α = desired angle of attack for the blade. Extend the segments from A to B'C to form angles θ_1, θ_2, θ_3 - - θ_{10}. It should be noted that this will not result in a prop building jig with helical pitch distribution except in special cases.



The example discussed above was for a helical pitch jig. The dotted lines to A' and A" show the type of pitch layout experimented with by Stan Chilton. Hardy Brodersen also reduces the angle of attack at the tip (washout) by the same method.

Next month - another graphical method and some arguments for prop gearing.

INDOOR PROPS - PRACTICE

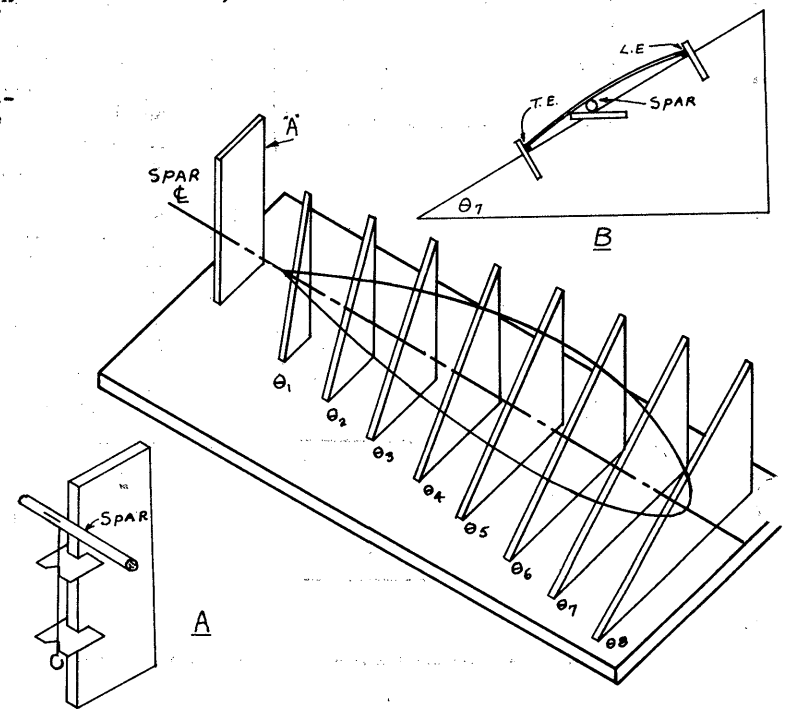
Part IV - Prop Jigs

Part I (Nov. '67 INAV) dealt with conventional prop blocks, design and construction. Carved prop blocks have several disadvantages. They are difficult to carve with ordinary tools, the block for a big prop is expensive, and you need so many if you build many different sizes of models. If you wish to experiment with non-helical pitch distribution (the THEORY series has implied that a prop which has a constant angle of attack will have a non-helical pitch distribution), it is difficult or impossible to carve a block to suit.

The prop jig below was submitted by Hardy Brodersen; he did not claim origin and I don't know who built this type of jig first. Nonetheless, this type of jig can be used to build props of any type of pitch distribution, and it can be quickly modified to produce a prop with different pitch at only one or two stations.

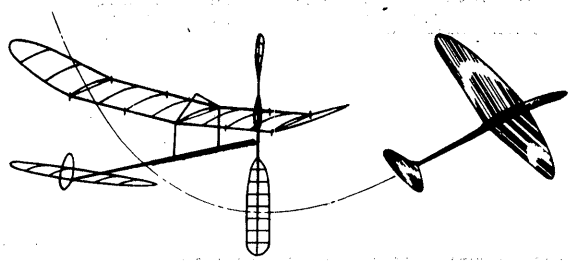
The design of this jig is done graphically - see the graph in THEORY (above). Each triangle in the jig below corresponds to a triangle in the sketch above, with like stations numbered alike.

Cut the station triangles carefully to insure accuracy. Measure their locations carefully on the baseplate. Glue θ_1 and θ_8 in place and pin a piece of 1/16" music wire or tubing to those two stations in the position shown by the centerline on the sketch. If you then glue the other stations in place just touching the wire, the whole jig will have proper alignment. Block "A" is located at the center of prop spar, to give a vertical reference for the prop hook. Two sheet metal pieces can be inserted in "A" to give a better reference (see sketch A). Each rib station needs to have three pegs installed on it (see sketch B). The center peg supports the prop spar during construction, and the other two define the blade outline.



The Voice of N.I.M.A.S. MAR·1968

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

HERBERT G. BAUGHMAN, 2345 13th St.SW, Akron, O. 44314
JAMES HANST, RD #2, Box 421, Valencia, Pa. 16059
CLYDE HARE, 2879 Anderson Dr., Allison Park, Pa. 15101
PAUL KASTORY, 132 Bronx Ave., Pittsburgh, Pa. 15229
JOHN H. KRICKEL, 1612 Springbrook Ct., Decatur, Ga. 30033
JAMES H. PERDUE, 603 Crestwood Dr., Tullahoma, Tenn. 37388
JIM STEVENSON, 4936 South 86th E. Ave., Tulsa, Okla 74145
CHESTER WRZOS, 184 Oak St., E. Orange, New Jersey 07018

Family Memberships

JOHNNY KRICKEL, 1612 Springbrook Ct., Decatur, Ga. 30033
CHARLES KRICKEL, 1612 Springbrook Ct., Decatur, Ga. 30033

Change of Address

Please note this change of address for Lew Gitlow and MicroDyne: P. O. Box 2338, Leucadia, Cal. 92024.

The Indoor Nats!

The Planning Meeting for the 1968 Nats was held at Olathe NAS, Olathe, Kansas during the week of Feb. 25, 1968. The following details about the Indoor Nats come from Pete Sotich.

The site will be the Kansas City Municipal Auditorium, which has floor area (inside the bleachers) of 125' x 200' with maximum ceiling of 96'. There are some obstructions which may or may not be movable, and their exact effect is hard to access from info presently available. Those who flew at Will Rogers Coliseum in 1964 can probably expect similar conditions; while the ceiling should be slightly better than the '66 Nats at the International Amphitheatre in Chicago.

Because of an attenuated schedule for the '68 Nats, Indoor will be flown on Sunday, Aug. 4, 1968, and will be staffed entirely by AMA personnel (timers and all). While every effort will be made to assure sufficient personnel, it is possible that a system of time-a-flight-fly-a-flight may be necessary. This can be minimized if rubber fliers will time HLG fliers (the usual time sharing schedule will be in effect) and visa-versa. Bud Tenny will CD the HLG session and Tem Johnson will CD the rubber session. Both of them will certainly appreciate all volunteer help that can be made available; please volunteer by sending your name to: Bud Tenny, Box 545, Richardson, Texas 75080.

It is anticipated that Indoor Scale will be held in similar fashion to last year, and will be CD'd by Jim Root, 3412 Norton, Independence, Missouri.

Dick Black Memorials

Jim Hanst recently made some color slides staged by Ron Ganser as the first contribution (finished artwork) to the Dick Black Memorial series. These particular slides are on the subjects of cutting spars and ribs, and pouring microfilm; they cover these two subjects well. After the slides are organized and the tape lecture made, these will be the first of the Memorial series.

To review what is planned, slide/tape lectures (combined with other audio-visual techniques where advisable) will be made available to clubs and individuals for instructional purposes. The following is a partial list of planned topics: Model winding, covering (paper and microfilm), model steering, model construction techniques, wire bending, rubber stripping and wood selection. Anyone who wishes to help with this project may contribute finished slides or suggestions for other topics.

Junior NIMAS Awards

The July '67 INAV announced the availability of NIMAS Awards for Juniors, with the following qualifying times:

Indoor Stick (Any class indoor model, single flight)

AWARD	Cat. I	Cat. II	Cat. III
Silver	7:30	15:00	21:00
Gold	9:30	18:45	26:30
Diamond	11:15	22:30	31:30

Indoor HLG (Best single flight of nine)

AWARD	Cat. I	Cat. II	Cat. III
Silver	0:18	0:34	0:41
Gold	0:22.5	0:41	0:49
Diamond	0:27	0:49	0:56

These awards, like the regular NIMAS Awards, are for NIMAS members only. Further details on the Award program can be obtained upon request.

NIMAS Awards

Silver Cat. I Rubber Award - 10:25, Bob Platt

Silver Cat. I HLG Award - 0:29.4, Ed Veselsky

Silver Cat. I HLG Award - 0:29.8, John Orrell

Gold Cat. I HLG Award - 0:32.2, John Orrell

NIMAS POSTAL MEET

A reminder to those who wish to enter the NIMAS Postal Meet: Your entry must be postmarked on or before Mar. 31, 1968. Check Feb. '68 INAV for nit-picking details; Easy B, HLG (2 classes), Indoor Rubber. Ceiling height corrected by NIMAS Fudge Factors.

Special note: Easy B to be paper covered only! Some of you have inquired; sorry I omitted that detail!

CONTEST CALENDAR

ALABAMA, Huntsville. Class AA Indoor Meet at Madison Co. Coliseum on March 31, 1968. Indoor Stick, Paper Stick, Cabin, Scale, Easy B. Cat. I Site. CD E. Minter, 2317 Calumet Ave. S.E., Decatur, Ala. 35601

MICHIGAN, Detroit. Annual Indoor State Meet; May 5 or May 12, 1968 at Michigan State Fair Coliseum. Firm date in April '68 INAV. Novice events: HLG, ROG and Cabin; two age classes for Novice. AMA events: HLG, Indoor Stick, Paper Stick, Indoor Scale. For entry blank or more info contact: Walter Hartung, 14759 Kilbourn Ave., Detroit, Mich. 48213

MISSOURI, St. Louis. March 15, 1968; Indoor Symposium by Kirkwood Thermaleers. Program by Lew Merlotti, Bob Hotze, Richard Hardcastle and Ed Capogreco. Held at Crestwood Bowl at 7:30 pm.

March 24, 1968 - Class AA Indoor Meet at East St. Louis Armory, 2931 State St.; 11 am to 5 pm. HLG, Easy B, Indoor Stick. Richard Hardcastle, 7319 Wise Ave., St. Louis, Mo. 63117

NEW JERSEY, Irvington. Indoor flying sessions; Madison Ave. Elementary School Gym every Tuesday 7 pm to 10 pm. Chester Wrzos, 184 Oak St., E. Orange, N. J. 07018, ph. 673-7951.

NEW JERSEY, Union. Indoor sessions, Franklin High School, Union, N. J. 7pm to 10 pm. March 21, 1968. Ernie Kopecky, 38 Fawn Lane, Watchung, N. J. 07060

PENNSYLVANIA, Pittsburgh. 4th Annual Allegheny Indoor Air Meet, March 31, 1968. Delta Dart, HLG, Prefab, Easy B, Indoor Stick/Paper Stick, Scale, Originality and Performance. 5 age groups. Ron Ganser, 2500 Mission St., Pittsburgh, Pa. 15203

TEXAS, Dallas/Ft. Worth/Denton. Class A Indoor contest, Mar. 24, 1968. Indoor Stick, Paper Stick, HLG, Scale, Sub.-Jr. Rubber (Delta Dart), Sub.-Jr. HLG. First place trophies plus NIMAS Certificates. Bud Tenny, Box 545, Richardson, Tex. 75080, ph. 235-4035.

VIRGINIA - Hampton. Brainbusters Annual Spring Indoor Meet at Willis School on April 14, 1968. Indoor Stick, HLG, Easy B. Cat. I site - 20' ceiling. Don Orr, 320-D 73rd St., Newport News, Va. 23607.

RECORDS? MAYBE!

BRAINBUSTERS CAT. I RECORD TRIALS - March 10, 1968
Willis School, 20' ceiling.
Open FAI Cat. I FAI - 17:29, Hewitt Phillips
Open C Stick - 19:30.2, Hewitt Phillips

INTERNATIONAL CONTESTS

ROMANIA - International Indoor Contest, Salt mine site. Organizer: Ion Bobocel, Aleea Titus no. 6, Raion N. Balcescu, Bucuresti, RS Romania. April 4-5, 1968

HUNGARY - Indoor Team Selection - Round 1, May 1, 1968 Hungarian Championship & Round 2, May 26, 1968; both these meets to be in Debrecen. Team selection, Round 3, June 9, 1968, in Budapest.

CZECHOSLOVAKIA - Brno. International Indoor Contest, July 6-7, 1968. Rudolf Cerny, Sumavska 22, Praha 2-Vinohrady, Czechoslovakia.

NEWS FROM AROUND THE WORLD

COLORADO - Denver. The Delta Dart portion of the Feb. 11 Magnificent Mountain Men contest was a smashing success. One hundred youngsters entered the meet and "zillions of airplanes crowded the sky with a blanket of humanity cheering them on." (Reported by Bill Gieskieng) This is one example of how successfully youngsters can be introduced to the concept of indoor flying; an easy next step is HLG and then Easy B.

TEXAS - Dallas/Ft. Worth/Denton. The Cliff Model Club Annual Indoor Contest was 38 entrants strong - one of the largest entries ever for this meet. The real battle - HLG - had been building up at previous flying sessions. Dick Mathis and Mike Fedor tied with 1:03.4 - a whopping 5.5 second increase over previous sessions. John Orrell was 3rd with 1:02. Brian Ganslen won Jr. HLG with 0:26, followed by Jimmy Clem (0:24.2) and Dennis Johnson (0:14.2). Other winners:

Paper Stick		Indoor Stick	
Dick Ganslen	8:32.0	Bud Tenny	11:27.0
Bob Wilder	7:44.8	Mike Fedor	10:19.0
Mark Valerius	6:02.0	Kristi Tenny	10:14.4
Indoor Scale		**Junior Jetco**	
Bob Wilder	111.4	Steve Valerius	1:20.0
Gene Simpson	94.0	Jimmy Clem	0:53.4
Mike Fedor	88.6	Louise Sturgill	0:46.0

STATE OF THE ART

Two of the top Easy B designs in the U. S. share the spotlight this month. The Kokomo Bomber by Jim Richmond and Al Rohrbaugh's Easy B are quite similar in design except for the rudder, and both models have rivalled times of Paper Stick models, even with all balsa props. Details are given on both built up and all balsa props, since the contests in the Midwest allow built up props on Easy B.

Jim explains certain design details of the Kokomo Bomber: "The stab is made without a center rib, but the paper is supported by means of a small balsa piece cemented to the boom. The wing rib layout adds strength to the wing by acting as a crooked spar. The fence on the stab trailing edge seems to reduce stall tendencies at the start. The extra wing offset was added for the same reason."

Al comments: "Although the light weight is an important factor for good duration, the prop is, as usual, somewhat critical. Due to the light wing, both tips will wash out under full power unless prop flare is enough to hold air speed low enough to prevent washout. The trick is to get maximum climb angle while keeping air speed just under stall. The wing is adjusted perfectly flat and the front wing post should flex sufficiently to permit the left wing leading edge to lift enough to give effective washin. When done properly, this method gives variable torque control while maintaining minimum washin. The rudder has approximately equal area above and below the boom to prevent rudder offset from twisting the boom. It might seem questionable to go to all this trouble, but it is a case of what the extra time is worth."

INDOOR PROPS - PRACTICE

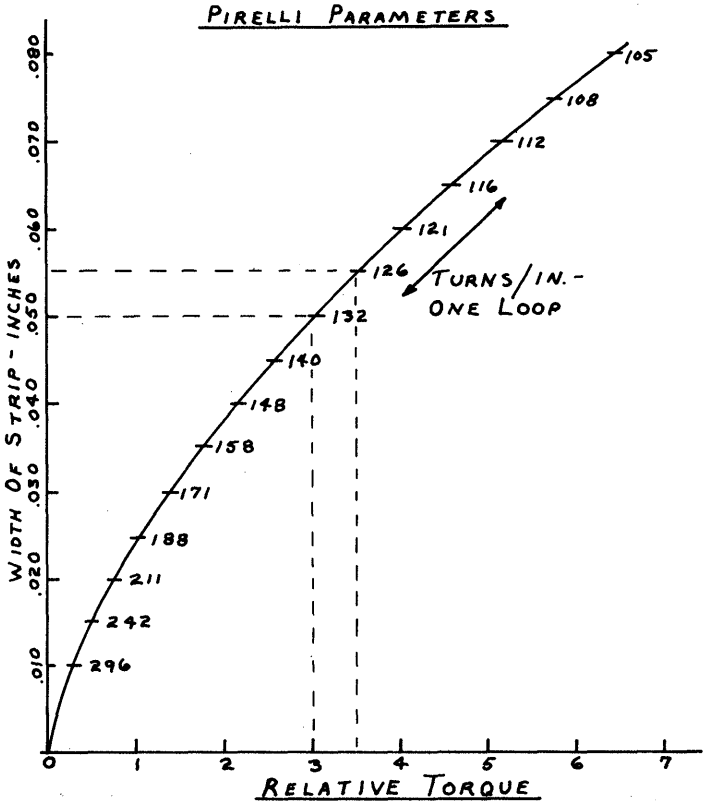
The continuation of Part IV which was scheduled for this issue will appear next month due to space limitations.

PIRELLI PARAMETERS

The chart below was furnished by Jim Richmond and the info presented in it was a joint effort by Jim and Charlie Sotich.

Pirelli is known as a highly variable substance, so none of the numbers below can be considered as absolute. However, the presentation gives maximum safe turns and relative torque as a function of strip width for the standard strip thickness.

An example on how to use the chart: if you substitute .055 rubber for .050 (same length loops), the weight will change by .055/.050 - an increase of 10%. Relative torque will increase by 3.5/3 or 17%, and the maximum turns will decrease by 126/132 or 4.5%. Since these are two standard rubber sizes, it is obvious that fine control of power has to be a matter of winding technique!

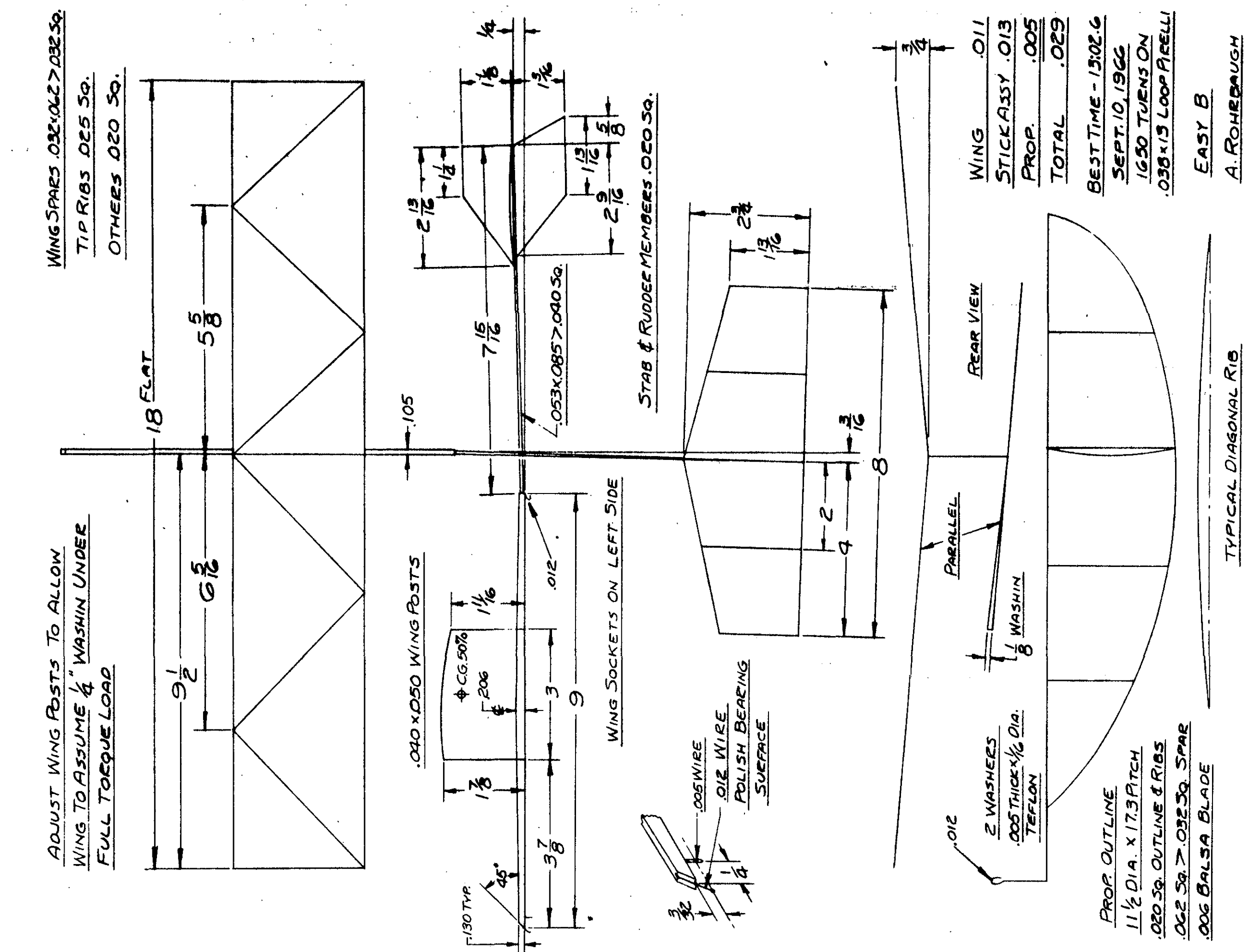


QUESTIONS AND ANSWERS

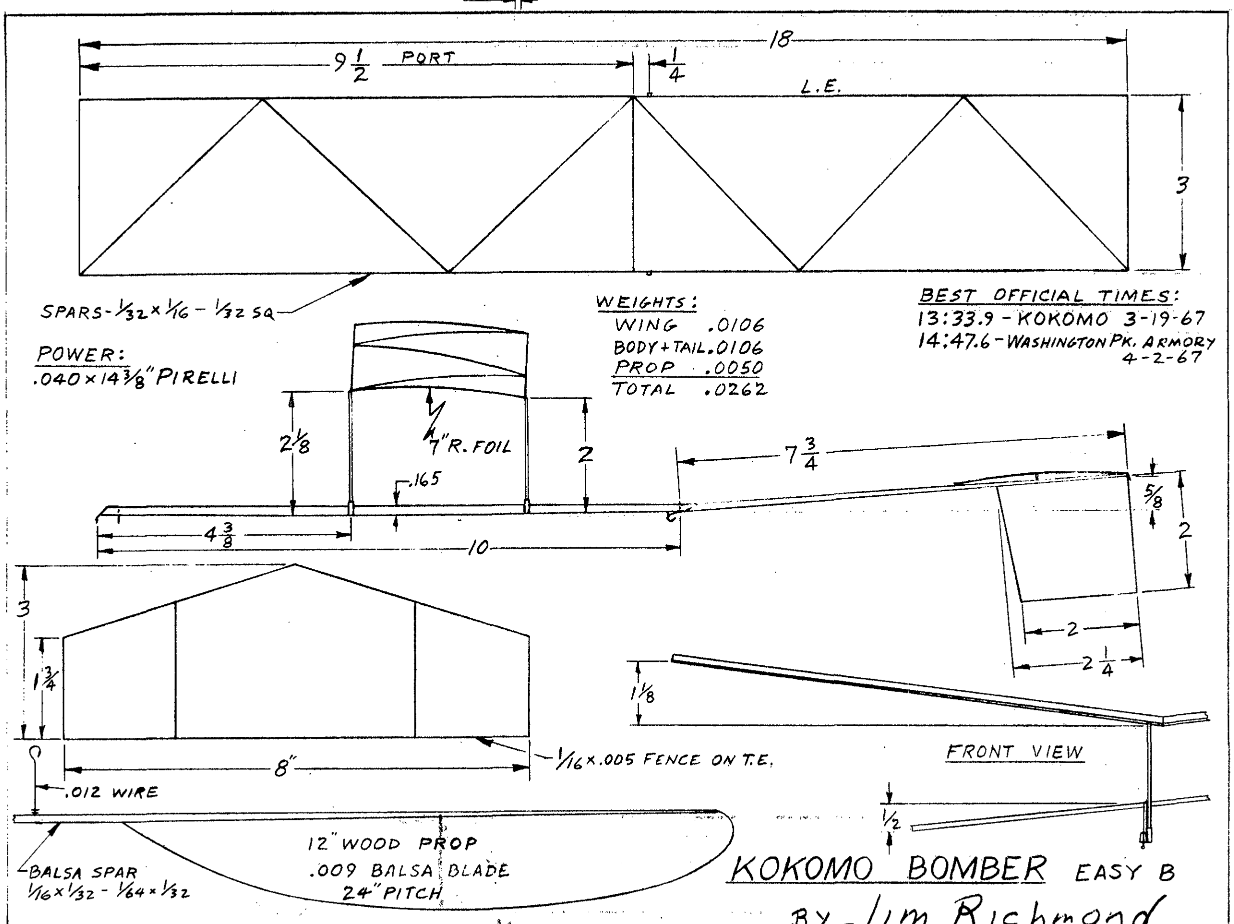
41. What is the best way to cover a prop with condenser paper?

The same problem of paper shrinkage exists for props as it does for other parts of a paper stick model, so the same precautions in that area apply. However, the real problem of prop covering is that the surface of the prop is a compound curve. It is near enough to a simple curve to use a single piece of paper; my method is this: Cut a piece of condenser paper about 1/4" larger all around than the blade outline. Fasten it to the spar at the hub end of the blade (microfilm solution makes an excellent glue for condenser paper), and pull it smoothly out to the tip. Glue it to the tip and wait for both places to dry before proceeding. Now use a fine brush and brush glue on the paper where the outline will touch it; start at the center of the blade outline on both the leading edge and trailing edge and work toward both the tip and hub. Glue a short bit at a time, working it as smooth as possible as you go. It is important to make the paper the same shape as the blade; this aids the paper in curving around the blade. After the glue has dried, trim carefully with a very sharp razor blade.

Various methods of pre-shrinking paper have been mentioned, any one of them will usually help prevent warps of condenser paper covered surfaces. Try this also: work inside a large deep box turned on the side. Place a heating pad inside the box, turned to low heat, and place the prop and paper inside for a couple of hours. This will dry out the paper and the air in the box; you can then proceed as outlined above.



WING SPARS .032×.062>.032 SQ.
TIP RIBS .025 SQ.
OTHERS .020 SQ.
18 FLAT
5 5/8
6 5/16
9 1/2
ADJUST WING POSTS TO ALLOW
WING TO ASSUME 1/4" WASHIN UNDER
FULL TORQUE LOAD
.105
.053×.085>.040 SQ.
7 15/16
2 13/16
2 9/16
.012
.040×.050 WING POSTS
C.G. 50%
9
3
3 7/8
45°
.130 TYP.
WING SOCKETS ON LEFT SIDE
STAB & RUDDER MEMBERS .020 SQ.
8
4
2
3/16
.005 WIRE
.012 WIRE
POLISH BEARING
SURFACE
REAR VIEW
PARALLEL
1/8 WASHIN
2 WASHERS
.005 THICK × 1/16 DIA.
TEFLON
.012
WING .011
STICK ASSY .013
PROP. .005
TOTAL .029
BEST TIME - 13:02.6
SEPT. 10, 1966
1650 TURNS ON
.038×13 LOOP PIRELLI
EASY B
A. ROHRBAUGH
PROP. OUTLINE
11 1/2 DIA. × 17.3 PITCH
.020 SQ. OUTLINE & RIBS
.062 SQ.>.032 SQ. SPAR
.006 BALSA BLADE
TYPICAL DIAGONAL RIB



18
9 1/2 PORT
1/4
L.E.
3
SPARS - 1/32 × 1/16 - 1/32 SQ
POWER:
.040 × 14 3/8" PIRELLI
WEIGHTS:
WING .0106
BODY + TAIL .0106
PROP .0050
TOTAL .0262
BEST OFFICIAL TIMES:
13:33.9 - KOKOMO 3-19-67
14:47.6 - WASHINGTON PK. ARMORY 4-2-67
2 1/8
7" R. FOIL
2
.165
4 3/8
10
7 3/4
5/8
2
2
2 1/4
3
1 3/4
8"
1/16 × .005 FENCE ON T.E.
.012 WIRE
1 1/8
FRONT VIEW
1/2
BALSA SPAR
1/16 × 1/32 - 1/64 × 1/32
12" WOOD PROP
.009 BALSA BLADE
24" PITCH
KOKOMO BOMBER EASY B
BY Jim Richmond

Part IV - Velocity Focusing

The following discussion is the brain-child of Bill Gieskieng, who first aired the subject in the MAGNIFICENT MOUNTAIN MEN Newsletter (a very entertaining sheet edited by Bill with the by-line "Official source of enthusiastic free flight propoganda"). Bill's topic then was FAI Power prop improvement; I inquired about applications to Indoor and got the following material.

Velocity focusing is the process of adjusting all prop blade station angles to approximately the same angle of attack at a given RPM and model velocity. Thus, Bill's design method begins with model velocity (there is not any shortcut to prop design - you gotta know velocity and you may as well make a flight profile while you're at it) the same as all other methods.

The most accurate method to handle velocity focusing combines trigonometric computation with graphical construction to design a prop construction jig such as was presented in PRACTICE - Part IV (Feb. '68 INAV). Fig. 1 illustrates the first step; the example presented will be for 60 RPM and velocity = 24"/sec. Line AC is 3.14 x prop diameter (16") and line CD is the distance travelled by the model in one prop revolution. This construction can be to scale, but keep the drawing large enough to retain reasonable accuracy.

Line AD represents the blade angle at the tip of a prop of 24" pitch, while AE is the angle at 5" diameter. A prop of 24" pitch would have zero angle of attack at 24"/sec. velocity and would give essentially zero thrust. To create useful thrust the blade needs an angle of attack. This series has used 7° as a convenient number, but no definitive work has proved 7° is any better than 5°, or any other angle.

Trigonometric computation of the angles in Fig. 1 gave 25.5° and 56.9°. Add 7° to each station (Fig. 2) to yield lines AD' and AE'. (This can be done graphically, but it is more accurate to compute E'B and D'C by trig.) The new pitch at station C is 32" and at B it is 31.8". For this case of velocity and RPM, velocity focusing yields helical pitch. It is well to note that for each different RPM only one velocity will satisfy the condition of uniform angle of attack across the prop blade. This is true for any prop with pitch distribution related to velocity; but the chances are slim that helical pitch is suitable for most common cases of velocity and RPM.

60 RPM is faster than most serious fliers use. Using 24"/sec. velocity, let's design a 16" dia. prop for 45 RPM. For those familiar with Bill's terminology, the basic rectangle (ACDF) represents the unloading factor (velocity where prop "unloads" or quits developing useful thrust.) The unloading factor is computed by dividing the velocity in inches/sec. by rev./sec. In our example, this is 24"/sec. divided by .75 RPS = 32"/revolution.

Fig. 3 is the graph for this example. Note that pitch must <u>increase</u> toward the hub if the prop is to have constant angle of attack across the blade. It was mentioned in the Feb. '68 issue that pitch limits for best efficiency would range from 20° to 60°; the example in Fig. 3 has 74° at 2⅛" radius and 40° at the tip. Clearly, much of the proposed blade will be operating in a very inefficient manner. (The supporting material for assuming that 20° to 60° is most efficient will be presented in the April INAV.)

Fig. 4 shows an example for 90 RPM and 24"/sec. velocity. Note that the slope of line D'E' is reversed from Fig. 3; blade angle ranges from 52° at 2⅛" to 35° at the tip. This prop is theoretically very efficient, but what good is a 90 RPM prop?

Bill suggests that indoor props be geared up at least 2:1 to take advantage of the higher theoretical efficiency inherent in higher RPM configurations. For the example of Fig. 4, 2:1 gearing would give 90 RPM on the prop, but the motor would be unwinding at 45 RPM. The obvious disadvantages of gearing are: an approximate 10% weight penalty due to the weight of the gears, and gear friction will absorb about 10% of the energy of the rubber.

Theoretically, several gains should offset the losses: the geared prop will absorb less torque; possibly less than half as much. This permits lower cross section and lower rubber weight to yield similar total turns input to prop system. Lower torque reaction (resulting from higher T/τ ratio) means less torque counteracting adjustments such as washin/washout and higher model efficiency. Also, changes in model velocity have lower effect on blade angle of attack. That is, a change of velocity to 26"/sec. will reduce the angle of attack in Fig. 3 by nearly 3°, while the angle of attack in Fig. 4 changes about 1°. Thus, a change in velocity due to gusts, upset, poor trim, CG shift (knots in motor bunch up to one end of the stick) will have a much lower effect on prop efficiency when the RPM is high. In the opposite case, where model velocity decreases, a slow RPM prop (Fig. 3) will already have most of the blade near the critical angle. As velocity drops, much of the blade can stall and contribute to a model stall. Quite possibly this is one cause of the "square turn" exhibited by some models in less than ideal air. Almost always, this maneuver gets the model into trouble!

Next month: a report of the material offered in rebuttal to the errors in Part II.

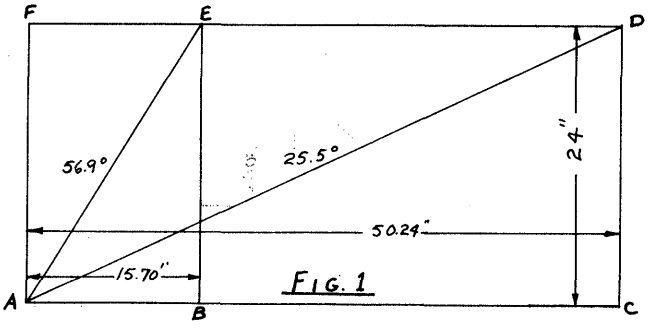


FIG. 1

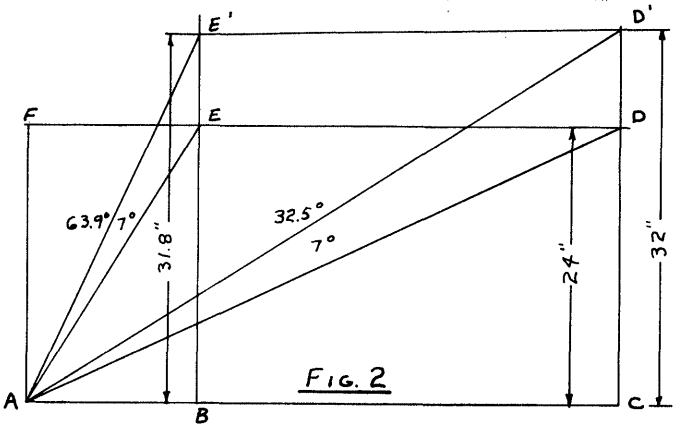


FIG. 2

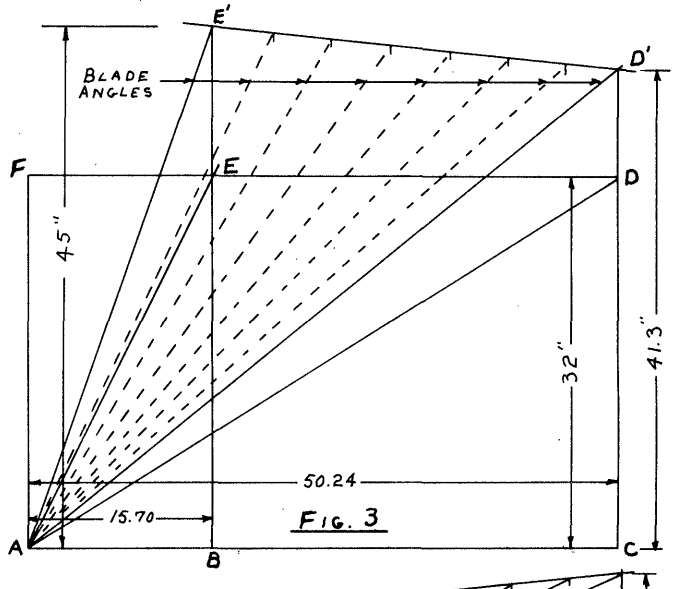


FIG. 3

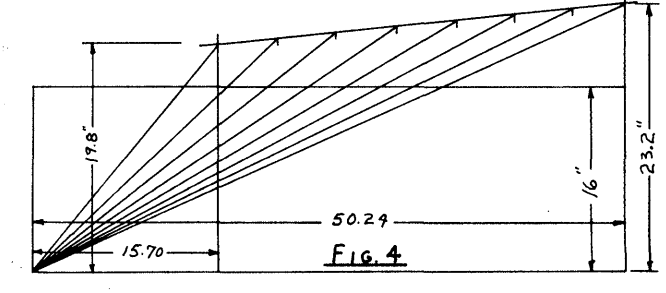
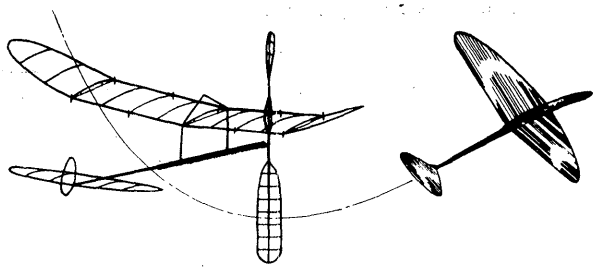


FIG. 4

The Voice of N.I.M.A.S. MAR·1968

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members

DR. EDGAR M. BOLLIN, 4829 Revlon Dr., La Canada, Cal. 91011
WAYNE O. BYAL, R.R. #1, Mingo, Ia. 50168
WILLIAM COLDITZ, 116 Smithfield St., Pittsburgh, Pa. 15222
JIM DAVIDSON, 1815 Melbourne Ave., N.E., Huntsville, Ala. 38501
MIKE FEDOR, 1926 Ballaway, Grand Prairie, Tex. 75050
ROGER M. LANG, 34-21 80th St., Jackson Hts., N.Y. 11372
DICK MATHIS, 2841 University Dr., Dallas, Tex. 75205
JAMES H. PERDUE, 603 Crestwood Dr., Tullahoma, Tenn. 37388
PAUL TRYON, 3128 Glenwood Ct., St. Ann, Mo. 63074

The Indoor Nats

As noted last month, the Indoor Nats will be held in Kansas City Municipal Auditorium, which has 96' ceiling and clear floor area of 125' x 200'. The event will be held on Sunday, Aug. 4, 1968 and will be staffed entirely by AMA personnel for all official duties including timing. At the last count, only two NIMAS members have volunteered to help with timing - many more are needed! In the event that too few volunteers are available, a time-a-flight-then-fly-a-flight policy will be necessary.

Nats entry blanks will be made available again this year by request. Send a stamped, self-addressed envelope (not necessary, just helpful) to AMA HQ with your request.

Indoor Scale At Nats

Indoor scale will be held at the Nats again this year, sponsored by various groups within NFFS. For more info, write Jim Root, 3412 Norton, Independence, Missouri.

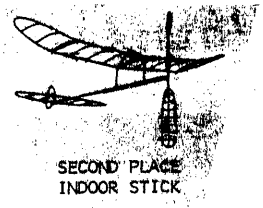
Trophy Plates?

Below are reproduced a view of special trophy plates which were used for an indoor contest recently. The plate is produced by a special photographic process on brushed aluminum and protected by an almost impervious coating. Anything which can be printed photographically (including half-tone photos) can be used, and the cost is less than most regular engraving processes without the airplane image. At least one club has expressed an interest in the plates; write Bud Tenny, Box 545, Richardson, Texas for details if you are interested.

This process was used to reproduce charts from INAV for my tool box, which certainly reduces wear and tear on the back issues! If enough interest is shown in these metal charts, they will be made available at cost. These charts have been set up for reproduction so far:

Feb. '67 INAV - Arc Thickness Nomogram
May '67 INAV - C. G. Location Chart
Mar. '68 INAV - Pirelli Characteristics

FIRST PLACE
INDOOR SCALE



SECOND PLACE
INDOOR STICK

NIMAS Awards

Silver Cat. I HLG Award - 0:27.2, Mike Fedor

Gold Cat. I HLG Award - 0:33.2, Mike Fedor

Gold Cat. I HLG Award - 0:34.3, Bud Tenny

Silver Cat. I Rubber Award - 11:06, Mike Fedor

Silver Cat. I Rubber Award - 10:00, Dick Ganslen

Silver Cat. I Rubber Award - 11:50.2, Jim Clem

Gold Cat. I Rubber Award - 13:03.8, Jim Clem

Diamond Cat. I Rubber Award - 15:17, Bud Tenny

Diamond Cat. I Rubber Award - 15:25.4, Stan Chilton

NIMAS POSTAL MEET

Junior entry in all events was disappointing; those Juniors who entered will receive a reprint of the Bilgri indoor series (1960 MAN) and a small plastic slide rule in addition to NIMAS Certificates. The results were computed by standard NIMAS Fudge Factors, correcting to the highest ceiling flown in each event:

Entrant	Ceiling	Time	Fudge	Score
Junior HLG - Cat. IA (18'-25' ceiling)				
Bill Gibbs	21.0'	0:51.7	1.0	0:51.7
Kenneth Fitch	19.0'	0:44.4	1.1	0:48.0
Open HLG - Cat. IA				
Ken Fitch, Sr.	19.0'	0:49.0	1.16	0:56.7
Nat Antonioli	22.0'	0:48.7	1.0	0:48.7
Clarence Mather	22.0'	0:47.1	1.0	0:47.1
Open HLG - Cat. IB (25'-35' ceiling)				
Bud Tenny	31.0'	0:34.3*	1.0	0:34.3
John Thornhill	30.0'	0:22.0*	1.13	0:22.7
Junior Easy B				
Robert Dunham	55.0'	6:46.6	1.0	6:46.6
Open Easy B				
Bob Platt	20.9'	8:42	1.62	14:12
Clarence Mather	22.3'	9:57	1.57	13:36
Richard Hardcastle	34.5'	9:58.6	1.26	12:34.6
Fudo Takagi	24.5'	7:32	1.5	11:16.8
Hal Crane	20.9'	6:55	1.62	11:12
Mike Fedor	26.0'	6:11	1.45	9:00
Bud Tenny	26.0'	5:25	1.45	7:52.2
Bob Dunham	55.0'	7:39	1.0	7:39
Bob Putman	26.0'	4:24	1.45	6:27.6
John Thornhill	30.0'	2:47	1.42	3:57

Thanks to all who entered; those who didn't enter, you missed a fun session at the least!

CONTEST CALENDAR

MARYLAND - Baltimore. Baltimore Aero-Craftsmen Annual on April 28, 1968 at 5th Regiment Armory, Bolton and Hoffman Streets. Cat. II, Max ceiling 75', lights at 35'. Contact Bob Sifleet, 61 Straw Hat Rd., Owings Mills, Md. 21117 Ph. 301-356-4421.

MICHIGAN - Detroit. Annual Indoor State Meet on May 5, 1968 at Michigan State Fair Coliseum. Novice events: HLG, ROG and Cabin; two novice age classes. AMA events: HLG, Indoor Stick, Paper Stick, Indoor Scale. Walter Hartung, 14759 Kilbourne Ave., Detroit , Mich. 48213 Ph. LA 7-7620

NEW JERSEY - Lakehurst. Cat. II - April 21, May 19, June 9, 1968. C. V. Russo, 143 Willow Way, Clark, N. J. 07066 Ph. 382-0871.

OHIO - Akron. Record Trials in 90' Goodyear hangar, April 28, May 12, June 23, 1968. You must give advance notice of attendance to Bob Randolph, 5785 Forest Ridge Dr., N. Olmsted, O. 44070, in order to obtain clearance for entry.

TEXAS - Dallas/Ft. Worth/Denton. At least one all-HLG meet and regular Cat. I RT's (no formal competition) planned - contact Bud Tenny, Box 545, Richardson, Tex. 75080 if you wish to be notified.

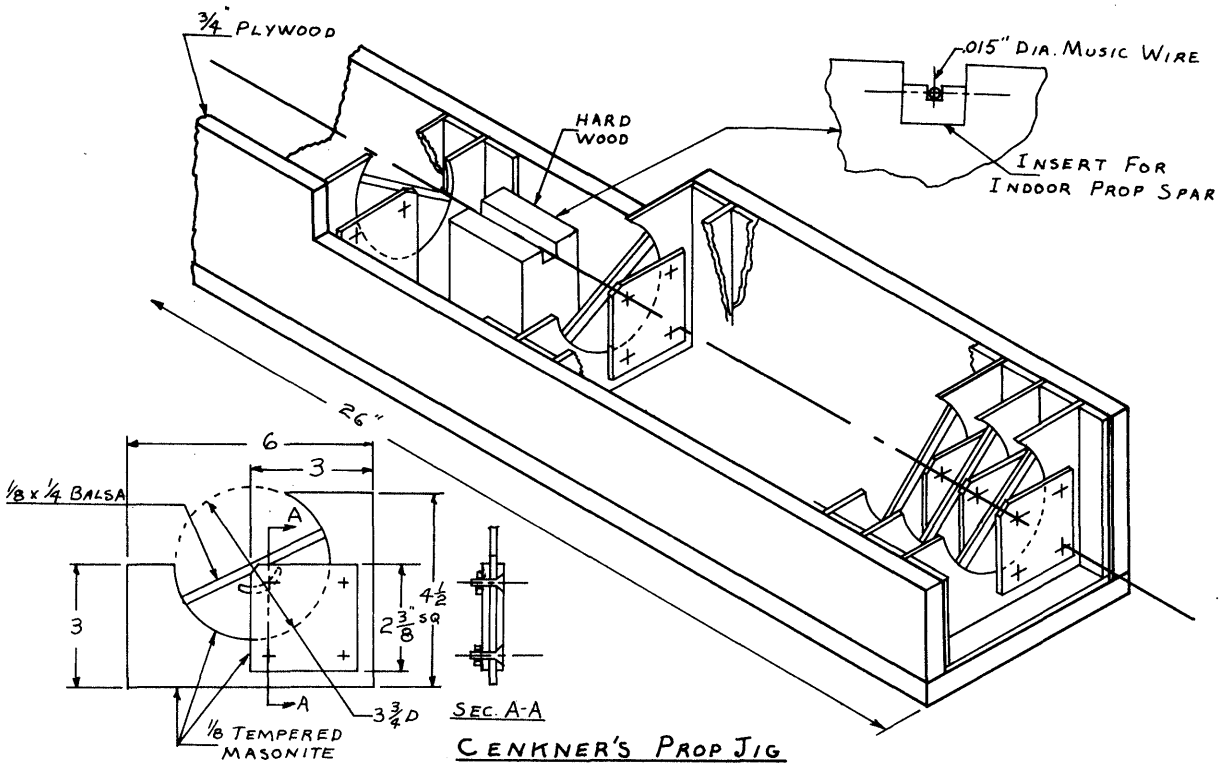
VIRGINIA - Hampton. Sanctioned meet or RT at Willis School, April 21, 1968. Hal Crane, 4002 Buchanan Dr, Hampton, Va. 23369

INDOOR PROPS - PRACTICE

Part IV - Prop Jigs

The prop jig below was designed and built by Ed Cenkner for Wakefield props. The blade angle at each station is adjustable according to whatever design scheme you prefer. To build indoor props on the same jig, an insert is put into the center block. Note that a music wire peg is used to align the spar during construction, then the prop shaft is installed after construction.

Since the drawing was made, Ed has added a pitch scale to the end stations. The pitch is then set at each end, and a string stretched between them. For helical pitch, each intermediate station is set tangent to the string.



CENKNER'S PROP JIG

STATE OF THE ART

The model of the month is long overdue - Harry Lerman's FAI. The model set the Cat. II FAI record at 17:46 early in the team selection program last year. The record didn't last long after qualification trials were held in higher sites, but the flight stands as a site record for the MIT Armory and is excellent time for the ceiling. The model uses a long motor stick and long inboard wing, typical of other models currently winning in FAI. Possibly this design pre-dated current winners; at least it is contemporary to models flown by Richmond and Rohrbaugh. A full size prop outline is furnished on the plan and full size wing and tail outlines are available on request.

NEWS FROM AROUND THE WORLD

OKLAHOMA - TULSA

The first Tulsa Glue Dobber's Annual was an excellent contest, in the usual TGD tradition. Poor weather outside threatened the lighter models at times, but conditions averaged out to quite good. Most events were fought down to the wire - really top competition. Probably the most notable was the close race between Tom Peadon's Vickers V-22 and Mike Fedor's Druine Turbulent. Tom had a very good scale model which made only short flights, while Mike made a flight of 1:32.6 to compensate for lack of scale detail. The results:

Open HLG		Junior HLG	
Dick Mathis	1:27.7	Bobby Hanford	1:11.5
Mike Fedor	1:26.8	Bobby Dunham	1:07.0
Bob Hanford	1:24.0	Mark Hawkins	0:41.8
Open Easy B		**Junior Easy B**	
Bob Dunham	7:39.0	Bobby Dunham	6:46.6
Mark Valerius	7:18.5	Steve Valerius	6:21.5
Bud Tenny	6:46.8	Bobby Hanford	4:49.5
Open Scale		**Junior Scale**	
Tom Peadon	130½	Bobby Hanford	98
Mike Fedor	121½	Greg Hibblen	74½
Jim Stephenson	113		
Indoor Stick			
Stan Chilton	16:56.2		
Bud Tenny	15:54.3		
Bob Dunham	11:40.4		

TEXAS - DENTON

The North Texas meet was also a hard-fought battle, with some of the same players from Tulsa. Stan Chilton and Bud Tenny battled it out with the same models, identical down to the same motors - looks like Bud would learn!

Open HLG		Indoor Scale	
Bud Tenny	1:07.3	Tom Peadon	131½
John Orrell	1:05.7	Mike Fedor	115½
Mike Fedor	1:04.1		
Indoor Stick		**Paper Stick**	
Stan Chilton	15:25	Dick Ganslen	10:00
Bud Tenny	15:17	Mike Fedor	6:11
Jim Clem	13:03.8	Dick Mathis	5:34.2
Junior HLG		**Sub-Jr Rubber**	
Robert Langenberg	0:32	Jimmy Clem	2:12
Jimmy Clem	0:30.4	Paul Brown	1:17
Paul Brown	0:30	Robert Langenberg	1:09.8

MISSOURI - ST. LOUIS

The McDonnell-Douglas meet drew fliers from Chicago as usual, and the major highlights of the meet came from the Chicago contingent. Rumor has it that this was the first HLG ever for Charlie Sotich, and Jim Richmond set a Paper Stick record with his "Kokomo Bomber" (March '68 INAV). The results:

Junior HLG		Open HLG	
S. Veselsky	0:50.5	J. Gremel	1:06.3
D. Veselsky	0:48.2	Bob Hotze	1:01.0
M. Hotze	0:23.4	Charlie Sotich	1:00.5
Open Easy B		**Indoor Stick**	
Jim Richmond	12:49.0	Jim Richmond	11:54.6
Richard Hardcastle	9:58.6	Charlie Sotich	10:42.4
Charlie Sotich	9:17.0	Richard Hardcastle	9:22.0

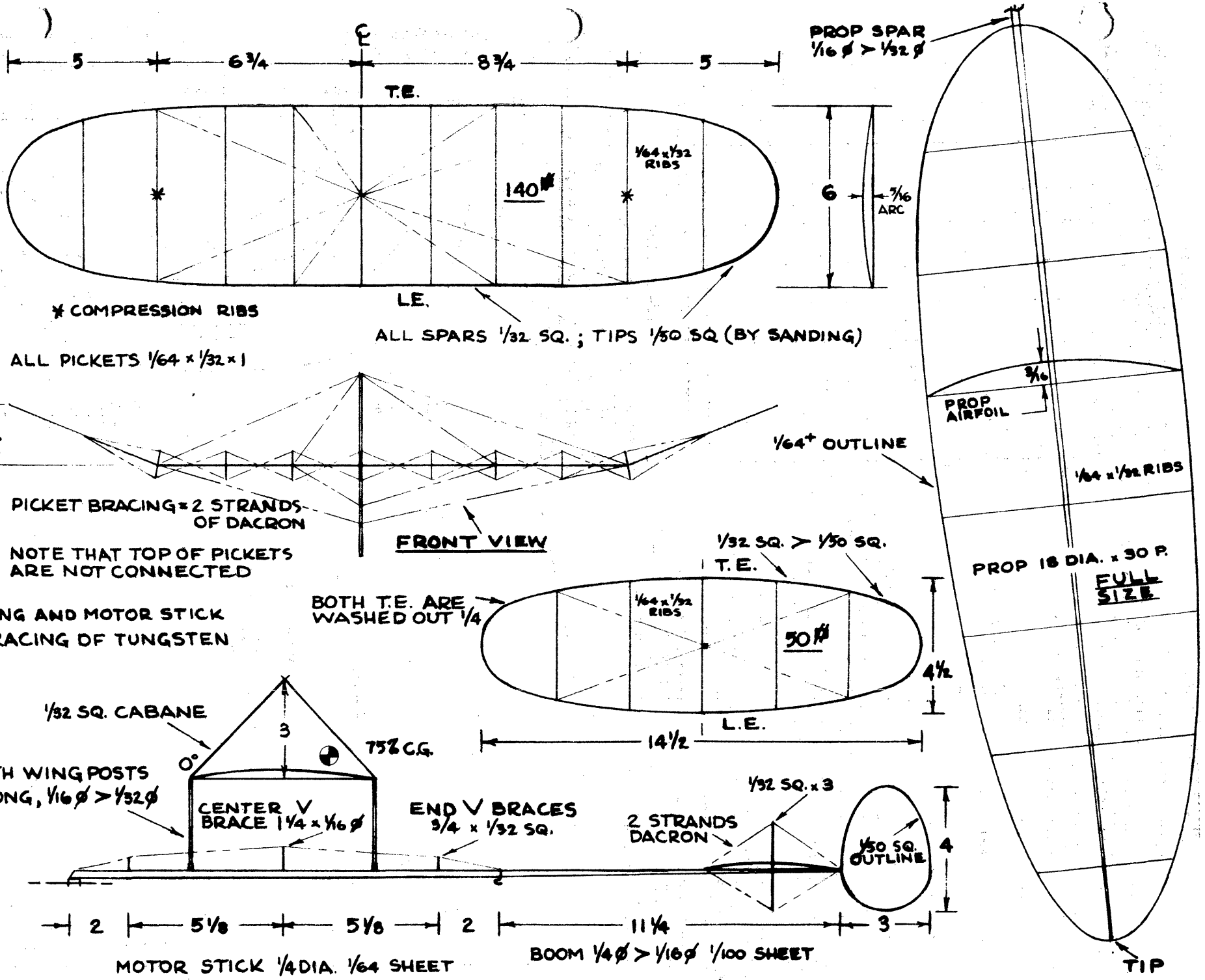
INDOOR - SOUTHEAST

Those who read CONTEST CALENDAR regularly will have noted contests listed in three cities in the Southeast - Tullahoma, Tennessee; Atlanta, Georgia and Huntsville, Alabama. These contests are very important to Indoor in a couple of ways. First, they are either the first meet in the immediate area in many years, or the first indoor meet for the state, ever. More important, these meets were billed as "First Annual" - indicating a healthy look to the future. Further, correspondence with fliers from these areas indicate eager anticipation of future meets and sessions.

65 CM. FAI
CAT. II AMA RECORD
17:46.0 4/25/67

DESIGNED BY:
HARRY LERMAN

DRAWN BY: BOB HANFORD



BARE WT. = .032 OZ. POWER = .074 POWER STRIP

SCALE: 1/4 SIZE EXCEPT AS NOTED

INDOOR PROPS - THEORY

Part V - Correction of Part II

Part II of this series presented some information that related prop efficiency to Thrust/Torque ratio. Two weeks later, three people had written to point out that prop efficiency was <u>really</u> proportional to $T/\tau r \tan \theta$.

Actually, each person made different trig substitutions and each got a different answer; it is possible to show that the answers are equivalent:

Larry Renger - $\text{Eff.} = T/\tau r \tan \theta$

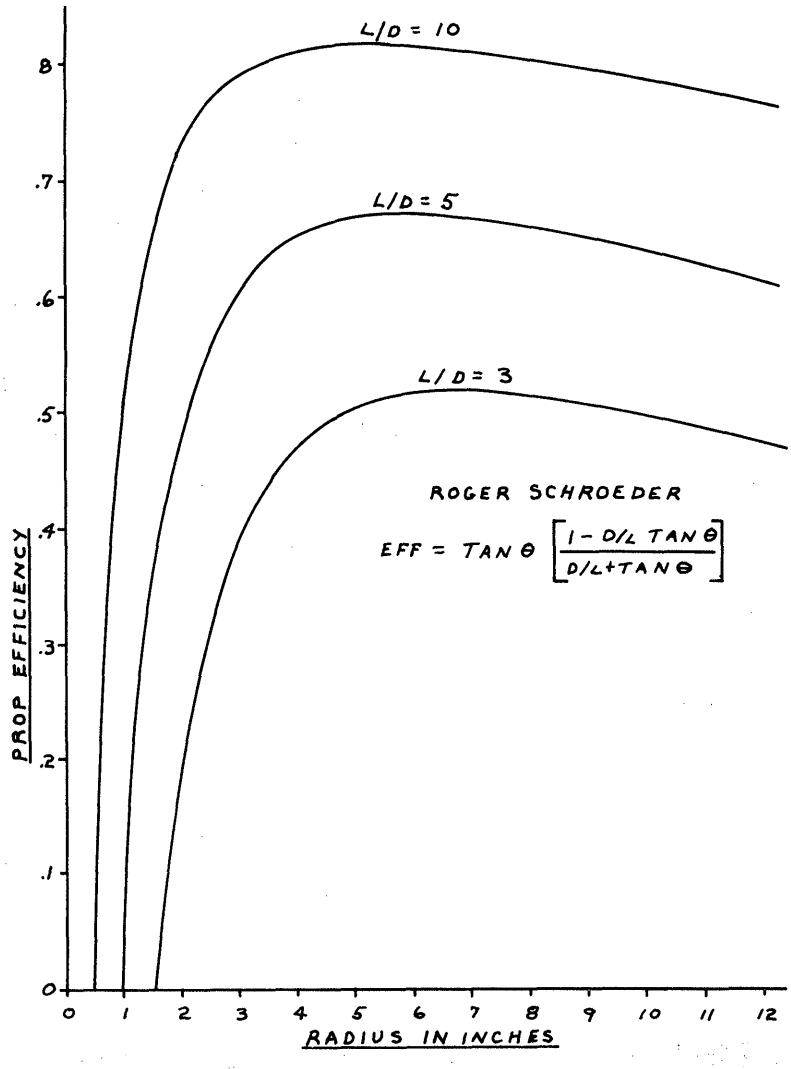
Roger Schroeder - $\text{Eff.} = \tan \theta \left[\frac{1 - D/L \tan \theta}{D/L + \tan \theta}\right]$

Bob Platt - $\text{Eff.} = \frac{1 - D/L \tan \theta}{1 + D/L \cot \theta}$

Copies of the derivations for the above are available upon request. The fact that three independent calculations arrived at equivalent conclusions is reasonable verification of the validity of the two graphs below. Schroeder's graph presents Efficiency as a function radius and clearly indicates rapid loss of efficiency near the hub. Platt's graph presents efficiency as a function of blade angle, which enables a designer to locate blade area according to the most efficient angles.

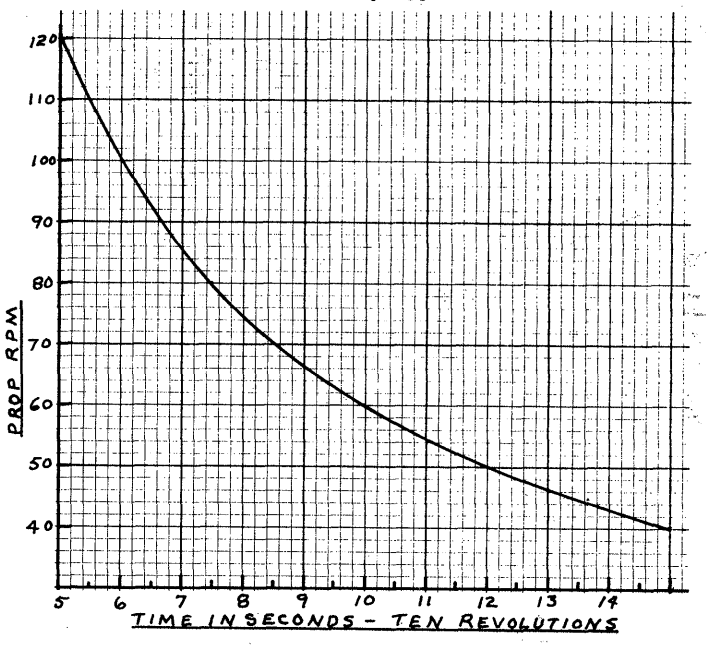
Both graphs strongly illustrate the effect of blade L/D on efficiency. No one has really proven just how bad or good our props are in terms of L/D; Larry Renger estimates that current practice may reach L/D of 5, while Walter Erbach has measured prop L/D as low as 2.

Next month: more on velocity focusing (described in March '68 INAV), which has become my personal favorite of all the methods of prop design mentioned. Questions or further rebuttal of material presented is welcomed, plus suggestions about prop topics which may have been ignored.



THE LAB

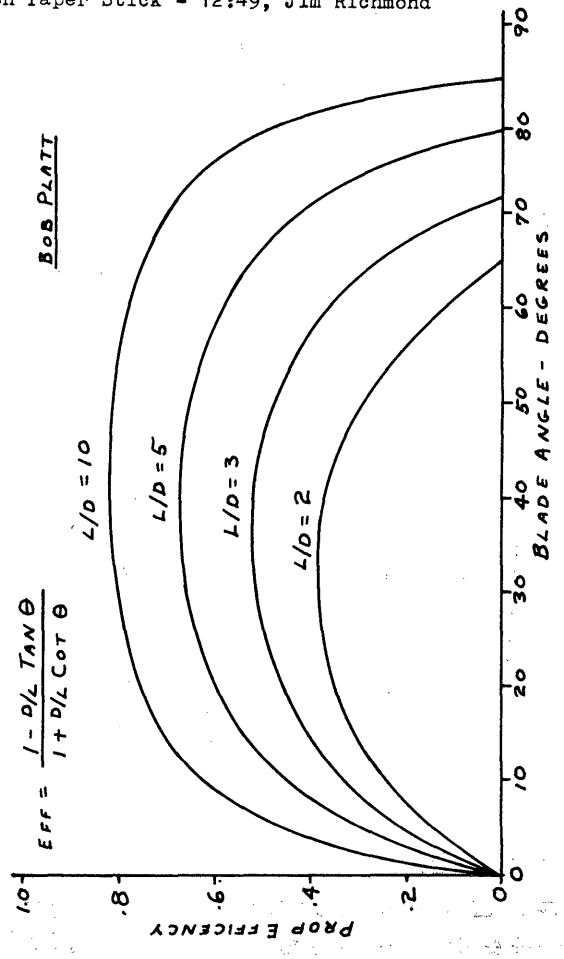
With continuing emphasis on flight profiles and close checking of model performance, a request was made for some sort of chart to give RPM directly. The result is the chart below, which graphs RPM vs. time in seconds for ten revolutions of the prop. Simply time ten revolutions of the prop and read RPM directly opposite this time.



RECORDS? MAYBE!

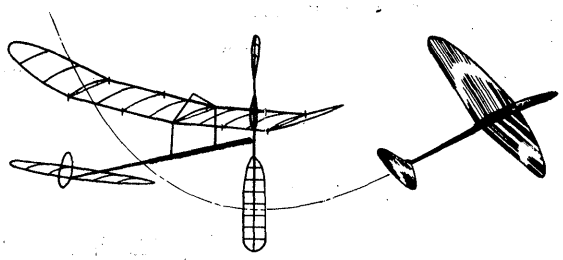
NORTH TEXAS INDOOR MEET - March 24, 1968
Texas Woman's Univ., Denton, Texas Cat. I 31' ceiling
Sr. AMA Cat. I FAI - 11:06, Mike Fedor
Sr. C Stick - 12:54, Mike Fedor
Open FAI Cat. I FAI - 15:25, Stan Chilton

McDONNELL DOUGLAS INDOOR MEET - March 24, 1968
East St. Louis Armory, Cat. I ceiling
Open Paper Stick - 12:49, Jim Richmond



The Voice of N.I.M.A.S. MAY·1968

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

WARREN G. LAWRENCE, 2210 Tilson Cir., Decatur, Ga. 30032
REX B. POWELL, 408 Glencoe Rd. SE, Huntsville, Ala. 35802

Sorry 'Bout Dat!

Last month, Jody was out of town during the time when the newsletter needed to be proofread. Thus, the April issue came out as the March issue (no, this was not a dodge to avoid Loof Lirpa's annual letter as was suggested by someone; Loof Lirpa hasn't written lately).

Besides the above, several errors crept into the results of the NIMAS Postal. First, all the results from Indoor Stick were omitted; these are listed below under POSTAL CONTESTS. Next, the asterisk (*) by the times of Bud Tenny and John Thornhill in Cat. IB HLG was supposed to tell you that these times were single flights. Finally there was an error in the ceiling height for times from Hampton, V. in Easy B. The correct ceiling was 19.8', the fudge factor changes to 1.66, Bob Platt's time changed to 14:36 (no change in place) and Hal Crane's time changed to 11:30 (4th place instead of 5th).

Move on to page 4: Roger Schroeder's graph of prop efficiency should have contained the notation that the curve was for 30" pitch. However, it was stated in the Feb. '68 INAV that efficiency varies only about 2½% at the 6" station, from 20" pitch to 35" pitch.

NIMAS Awards

Effective immediately, it is permissible to use FAI ceiling measure to define the ceiling height of your site in applying for NIMAS Awards. Please note that FAI measure was used when you fill out the application form, and read your Rule Book! The rule states that measure is made to "primary structure of the building." That does not include lights, wires to support bunting or decorations, or other auxiliary stuff which messes up the flying.

The general effect of the above will be to give a more realistic assessment of ceiling category, while retaining the same three AMA ceiling categories.

I wish to apologize to many NIMAS members who have had Awards coming for some time. I finally caught up with the backlog this month, and all the undelivered awards have been distributed except local ones that will be given out in person. If I have missed anyone whose award was listed anytime before this issue, please let me know.

Silver Cat. I Rubber Award - 10:13, Dan Belieff

Silver Cat. I Rubber Award - 11:54.6, Jim Richmond

Gold Cat. I Rubber Award - 12:45.4, Bob Platt

Gold Cat. I Rubber Award - 12:49, Jim Richmond

Diamond Cat. I Rubber Award - 15:15, Tom Vallee

NIMAS Charts

Considerable response was made to the announcement of a new process for producing trophy plates and charts from INAV on specially coated aluminum plate. The charts have scaled down slightly from the size they are in INAV - to 3" wide from 3.7" wide. The first two that will be made available are the RPM/Time chart in the April '68 (Mar. #2!) and the Pirelli Parameters chart from Mar. '68 #1 INAV. The Pirelli chart has been modified to include the weight/inch figures for Pirelli. Prices are based strictly on the amount of metal used: RPM/Time - 85¢; Pirelli Parameters - $1; CG Location - $1.10 (May '67 INAV) and Arc Thickness Nomogram - $1.20 (Feb. '67 INAV).

New Film Now Ready

Joe Poloso has made another film of activity in Hangar #2 at Lakehurst - this one in color. It will be available for loan as soon as your editor gets to view it - perhaps in about two weeks. Get your name on the list!

Bilgri Reprints Available

By special arrangement with Model Airplane News, the three articles on indoor building by Joe Bilgri, which appeared in M.A.N. in 1960, have been made available at cost. This cost is 60¢ (which includes postage), and the money should be sent to Harry Keshishian, 7 Sagamore Rd., Arlington, Mass. 02174, or Bud Tenny, Box 545, Richardson, Texas 75080. (Price listed covers all three articles)

Help Wanted!

All fliers who plan to attend the Nats are reminded that timing help will likely be very short. Anyone who plans to attend should make plans to help time at the Indoor Nats, since Navy timers will not be available. A few of you have already volunteered, but many more will be needed. Please notify Bud Tenny, Box 545, Richardson, Texas 75080 if you can help, and whether you can help with HLG or rubber or both.

FFCB Chairman Resigns

I have deemed it advisable to resign as Chairman of the Free Flight Contest Board. I took this action because of a total lack of response by the AMA President to my official memos. I the hope that the president will name a Chairman he will communicate with. Certain FFCB business requires action by the president, so the FFCB is stalled until this action is taken.

POSTAL CONTESTS!

Recently Bill Gibbs issued a postal challenge to any takers - members of the D. C. Maxecutors took him up:

Name	Site	Stick	Paper	HLG
John Thornhill	20.5'	-	3:23.5	0:36.0
Dan Belieff	20.5'	-	6:31.5	0:47.2
Tom Vallee	20.5'	10:36.6	-	-
Bill Gibbs	21.0	8:10.4	3:46.2	0:52.4

NIMAS Postal Meet

Entrant	Ceiling	Time	Fudge	Score
Junior Indoor Stick				
Bill Gibbs	25'	8:23.2	1.02	8:33.0
Kristi Tenny	26'	7:37.4	1.0	7:37.4
Open Indoor Stick				
Hewitt Phillips	19.8'	19:30.2	1.14	22:15
Hal Crane	19.8'	15:20	1.14	17:30
Bud Tenny	26'	15:17	1.0	15:17
Clarence Mather	24.5'	14:09	1.03	14:35.4
Jim Clem	26.0	14:04	1.0	14:04
Brian Down	22.3'	11:07	1.08	12:00.1
Fudo Takagi	22.3'	10:45	1.08	11:37.2

CONTEST CALENDAR

OHIO - Akron. Record Trials in 90' Goodyear hangar, May 12, June 23, 1968. You must give advance notice of attendance to Bob Randolph, 5785 Forest Ridge Dr., N. Olmsted, O. 44070 in order to obtain clearance for entry to site.

NEW JERSEY - Lakehurst. Cat. II RT or contest - May 19, June 9, 1968. C. V. Russo, 143 Willow Way, Clark, New Jersey 07066 ph. 382-0871.

TEXAS - Dallas/Ft. Worth/Denton. Cat. I RT May 18-19, 1968 with HLG only on May 18 and Rubber only on May 19. Bud Tenny, Box 545, Richardson, Tex. 75080 231-4035

RECORDS? MAYBE!

AKRON RECORD TRIALS - March, 1968 90' ceiling - Cat. II
Goodyear Hangar, Akron, Ohio
Open Paper Stick - 20:41.4, Bob Randolph

STATE OF THE ART

This month's presentation is also late - not due to any delay by Al Rohrbaugh - but to my own delay in sending it out to be drawn up. The model holds the Cat. II B Cabin record, and set the mark during the FAI Semi at Detroit last year. It is typical of Al's careful workmanship and light weight, and the time is excellent for the site (only 65' ceiling).

INDOOR PROPS - PRACTICE

A Direct Reading Pitchmeter

by Charlie Sotich

With the device shown it is possible to measure prop pitch directly at any point along the blade (starting about 1½" from the hub). This makes it possible to compare props directly instead of assuming each is exactly like the block it was built on, and thus determine why different flight results are achieved with props that are supposed to be identical. The pitchmeter is easy to use:

1. Remove the carriage from the base and mount the prop, using a small rubber band to lightly pull the prop shaft into the bottom of the Vees.

2. Mount the carriage on the base with one prop tip in the slot of the disk. Rotate the disk to give clearance for the blade as you move the carriage to the desired radius for measurement, and stop the disk so the bottom of the slot is parallel to the bottom of the prop blade.

3. Read the blade radius from the scale under the carriage. Read down the chart along the line corresponding to this radius until you reach the top edge of the pointer. Now move horizontally to the side of the chart and read the pitch.

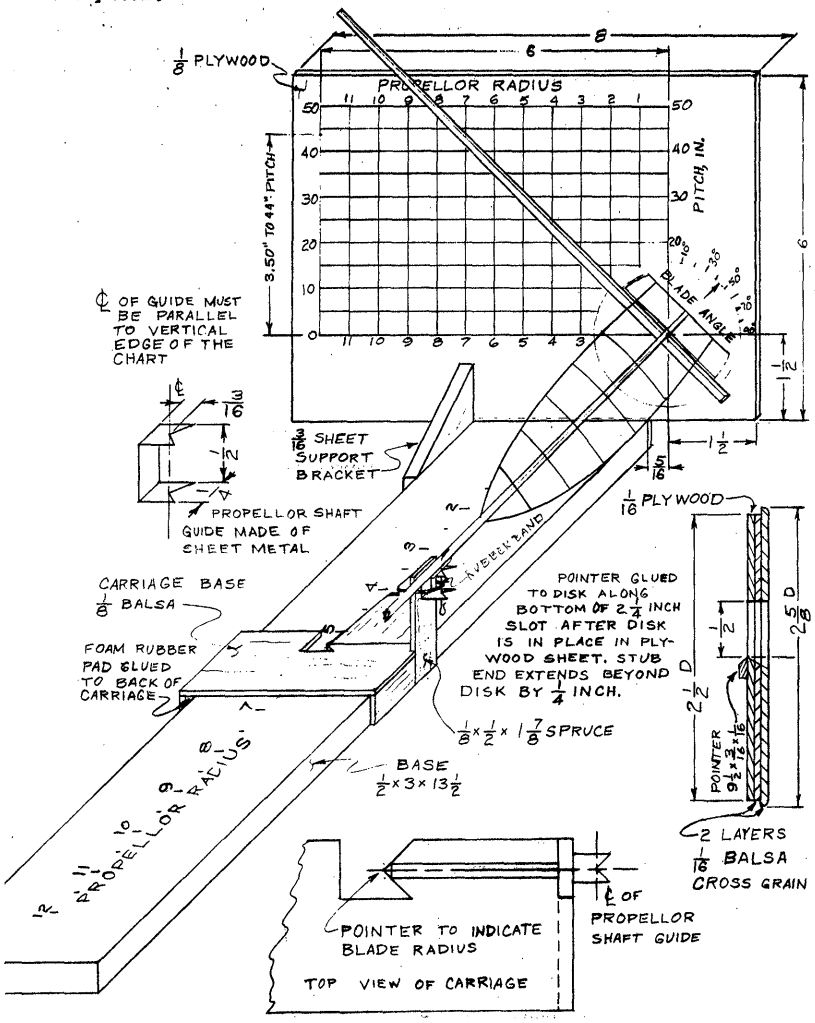
A few notes on the construction of the pitchmeter:

1. The axes of the chart must intersect at the center of the disk for accurate readings. Draw sharp lines on the plywood to mark the edges of the chart before cutting the opening for the disk.

2. Lay out the chart with radius increments of 1/2" spaced 1/4" apart. Lay out the pitch scale in increments of 1" pitch. Determine the spacing of the pitch scale by dividing 3.5" into 44 parts so each part = 1" of pitch.

3. The centerline of the Vees which hold the shaft must be parallel to the vertical lines on the chart. Mount a straight piece of wire in the Vees, and file on the Vees until the wire is parallel to the chart lines.

4. Lay out the prop radius scale on the base after assembly, using a ruler to measure from the face of the disk to the centerline of the Vees, and place marks on the base at the carriage pointer.

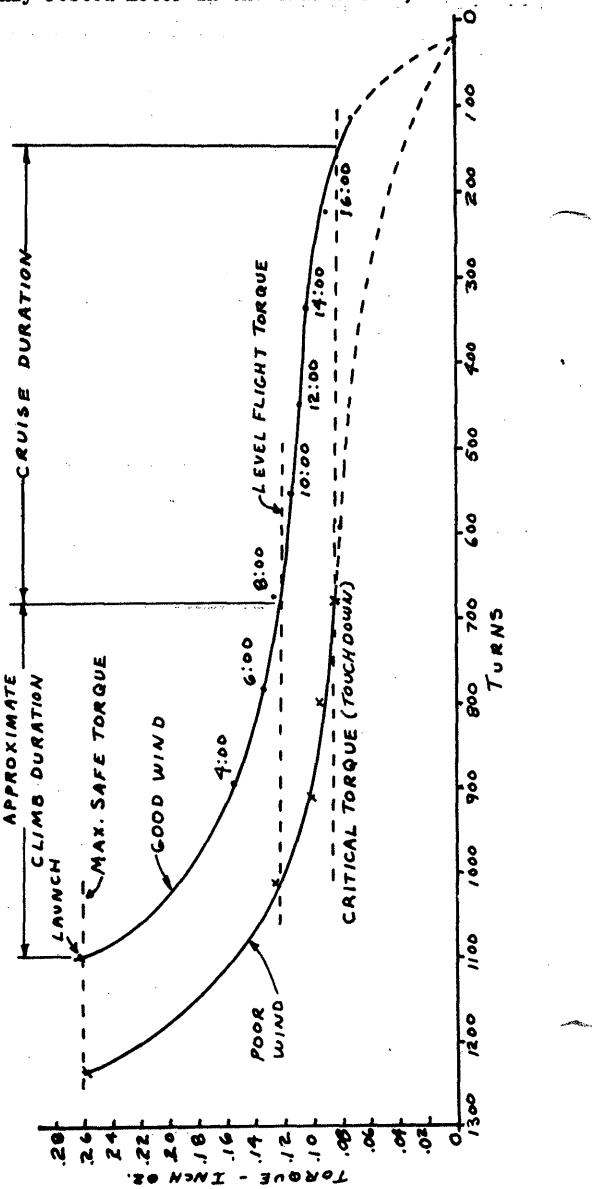


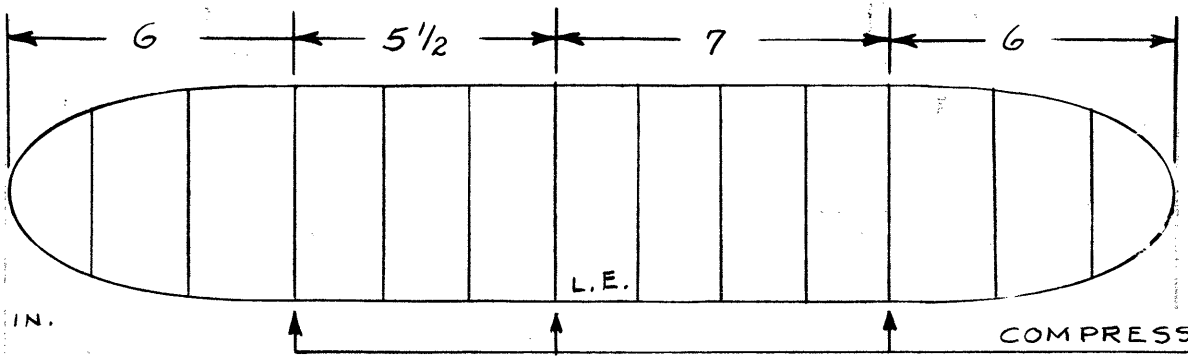
THE LAB

Altitude Control and Duration Prediction

This is a preliminary report of a promising flight analysis method developed by Jim Clem. One of Jim's toy airplanes refused to rafter-bang properly, so he began using his torque meter to limit model torque at launch. The accuracy of this technique is astounding - he repeatedly uses maximum altitude and rarely touches more than two or three times per flight.

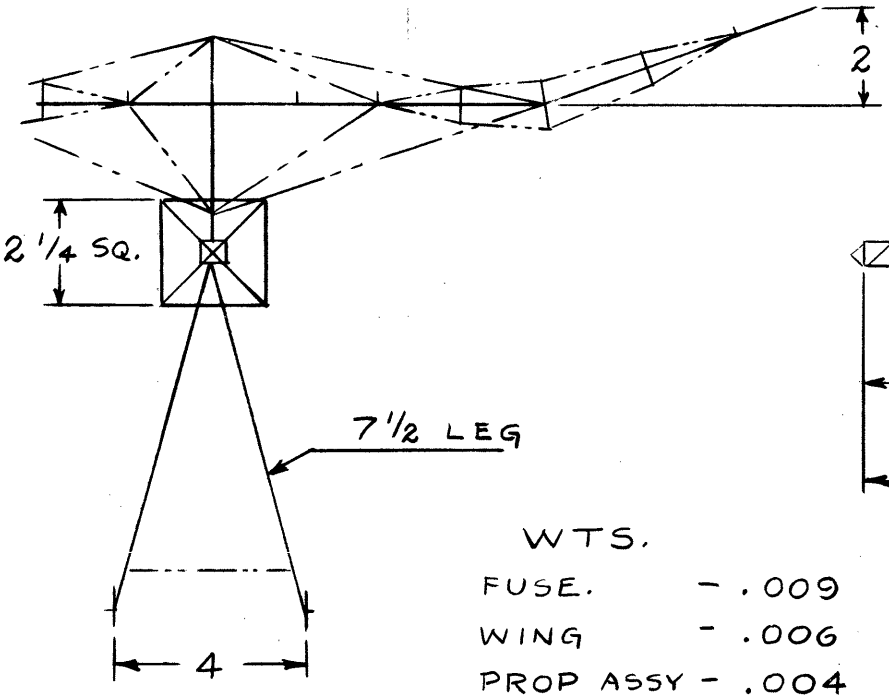
The next step was to obtain an RPM profile of a good flight. This information was used to reconstruct a torque profile of the flight. This was accomplished by winding the thoroughly rested motor in the same manner, then un-

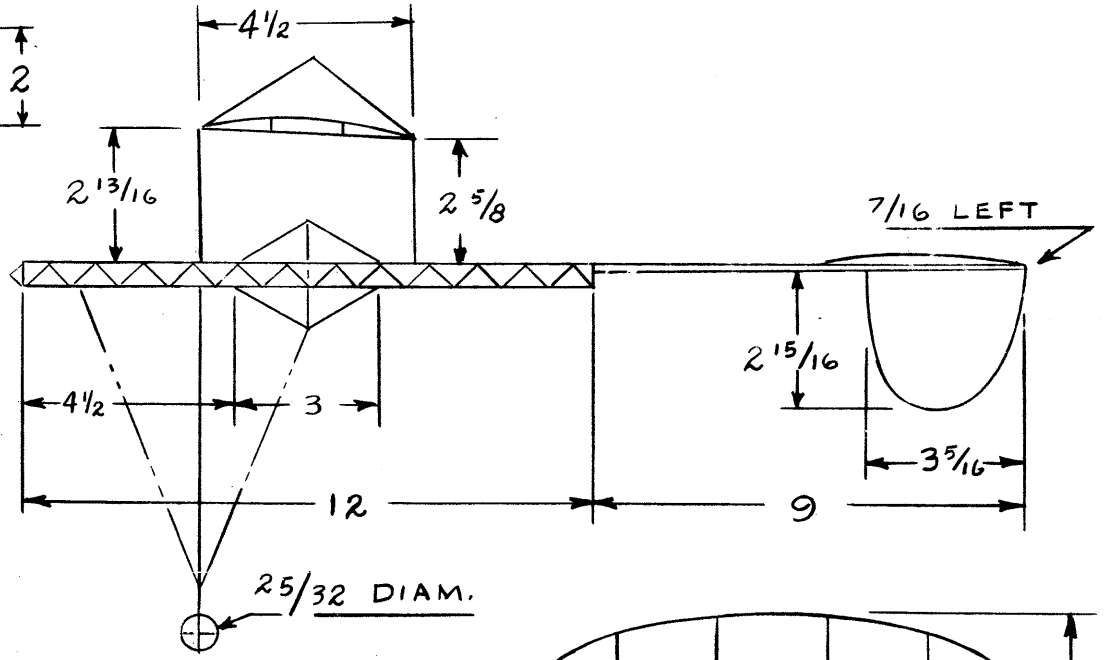




ALL BRACING
.0005 TUNGSTEN

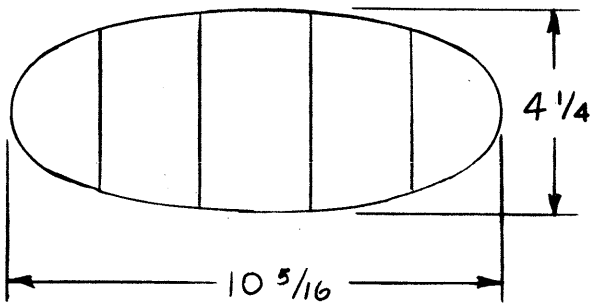
PROJ. SPAN - 23.9 IN.
99.48 SQ. IN.





WTS.

FUSE.	-	.009
WING	-	.006
PROP ASSY	-	.004
TAIL ASSY	-	.005
		.024 oz.



36.56 SQ. IN.

PROP: 15" D. x 27 P.
SINGLE SPAR
1 5/8 MAX. WIDTH @ 4 1/4 RAD.
17" LOOP OF .040 PIRELLI
1575 TURNS FOR RECORD

CLASS B CAT. II CABIN RECORD
JUNE 18, 1967 - DETROIT
COLISEUM - 65' CEILING.
18:25 MIN. - A. ROHRBAUGH

1/2 STAB. TILT

GEO. BATIUK SR.

winding slowly and taking torque readings at three significant points: torque at launch (for reference), level flight torque and torque at touchdown. The graph below shows how these figures are used.

The maximum safe torque level represents that torque which limits altitude to just less than the available ceiling; it is reached by winding the motor past the required torque level and backing off turns until the torque is correct. Therefore, some new motor is treated in the same fashion and a plot of torque vs. turns is generated by unwinding the motor and recording torque at suitable intervals as shown in the graph below.

It is reasonably accurate to assume that a similar motor will give similar RPM profiles with the same prop and model, so time as a function of RPM (turns left after X minutes of flight) is marked on the torque curve. The three torque levels are marked on the graph, and flight times for end of climb and touchdown are then approximated from the graph as shown on the upper curve.

The lower curve on the graph was generated by using a different winding technique from the other curve. It is strong evidence that winding technique is critical, since this curve was taken just before the higher energy curve.

INDOOR PROPS - THEORY

More On Velocity Focusing

After several sessions using velocity focusing (March '68 INAV), I have become convinced it is the most flexible design method. In particular, velocity focusing designs directly the prop jig shown in the Feb. '68 INAV. This type of jig is easiest to modify, and seems to be easier to work with during prop construction.

Two characteristics of velocity focusing were not covered before. First, the design concept of a certain RPM coupled with a given model velocity tends to leave the impression that the prop is good only for that one velocity/RPM condition. Not so! Fig. 1 shows how RPM varies with velocity for the prop designed in Fig. 2. Design conditions for this prop were 1.6'/sec. and 50 RPM, which gives an "unloading factor" of 23". Other combinations of RPM and velocity with the same unloading factor are shown on the graph, which permits forecasting of RPM under other conditions of velocity.

The second unmentioned characteristic of velocity focusing is that the ideal (assumed by the method) of constant angle of attack across the blade is not linear as assumed in the preliminary discussion. That is, line D'E' is curved slightly in the area of interest (the blade is to extend from 3" radius to 9" radius). As shown in the dotted portion of D'E', the line rises steeply nearer the hub. This is of little concern as long as the blade area does not extend close to the hub, and so long as extreme combinations of low RPM and high velocity are not used.

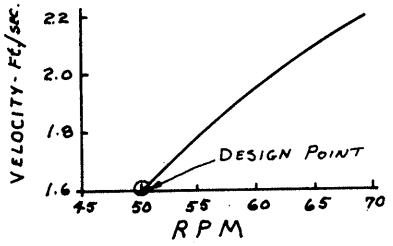


FIG. 1

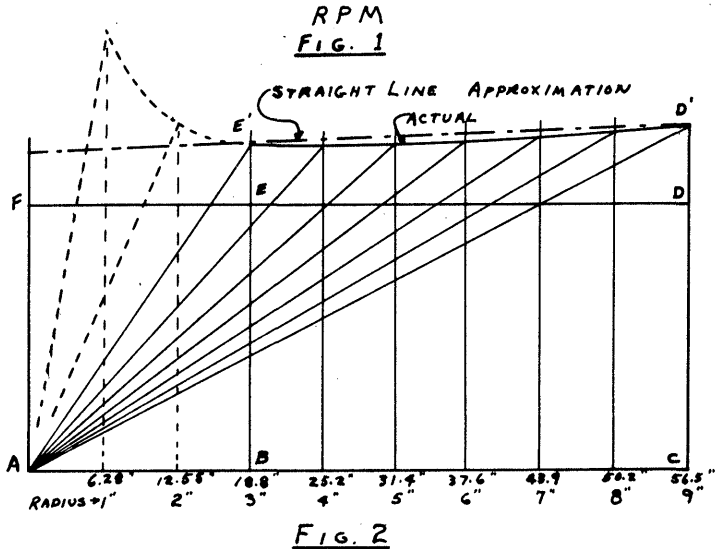


FIG. 2

A loose end remains with regard to VF prop design - how do you designate the pitch? How about 1.6/50/6 for a prop built from Fig. 2 above? (1.6 FPS velocity, 50 RPM and 6° angle of attack).

This presentation completes the series of prop theory. Rebuttal and other minor considerations will be presented in future issues as space allows - if you have comments, let's have them. The whole subject of flaring props has been purposefully left out, since no theory applies to non-rigid props directly; if you have helpful comments please air them.

THE LAB

A Rubber Testing Method

It is a matter of great interest to all serious fliers to find reliable, non-destructive methods to test Pirelli. The real problem of testing rubber is that if you find out the ultimate energy storage potential of a piece of rubber by some test, you have just "used up" the piece you used for the test. Quality control on rubber strip seems to be difficult, because the quality seems to vary along the length of even short pieces of rubber. Thus, you can test completely one piece of a batch and get a bad motor right next to that section.

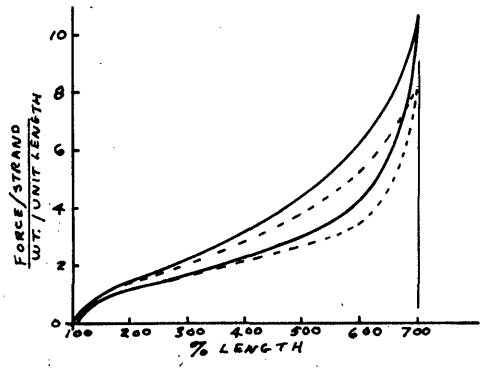
Charlie Sotich has developed a test for rubber which is showing promise. The basic test goes thus: A sample is weighed, then arranged in clamps that hold the ends. A 1" segment is marked on the sample and the whole piece (about 10" long) is stretched to 7 times normal length in six equal steps. The elongation of the marked segment and the stretch force is recorded at each step. The rubber is then relaxed in the same six steps and the force and elongation recorded at each step. This process gives the rubber some permanent "set" and some of the resulting slack will eventually come out as the rubber recovers.

This property of failing to return exactly to the same length is called hysteresis. A graph of the stretch force as recorded on both stretch and relax cycles will give an idea of the quality of the rubber.

The vertical (Y) axis of the graphs below is figured to this formula:

$$Y = \frac{\text{Force/Strand}}{\text{Weight/length}}$$

When this set of values is plotted against elongation, curves of the type shown below result. If you consider the area under the curve, the total energy input to the rubber has the bounds of the upper part of the curve and the X axis, while the usable energy lies between the lower part of the curve and the X axis. The area between the upper and lower parts of the curve is lost due to hysteresis and "set" in the rubber. Two sample curves are shown from different batches of rubber. The relative difference of quality can be expressed by a ratio of usable energy of the two samples.



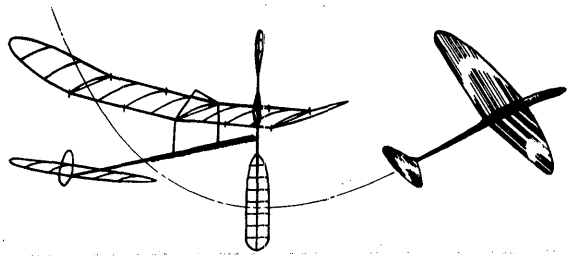
NEWS FROM AROUND THE WORLD

GEORGIA - ATLANTA

Enthusiastic indoor fliers in Atlanta arranged a last-minute indoor session as an official part of the Georgia State Championships, with plans to make Indoor an annual event there. Not only is this the first Class AAA meet to hold Indoor in years, inclement weather increased spectator attendance and "exposed" over 100 fliers from three states to indoor flying - many built gliders on the spot. Guy Eaves won Easy B with 3:00, followed by Johnny Krickel (2:40.5, Sr.) and Charles Krickel (Jr. Easy B - 1:55.6). Open HLG - 0:35.1, Ben Cleveland, Sr. HLG - 0:30.8, Steve Perryman; Jr. HLG - 0:28.7, Charles Krickel. 20' ceiling!

The Voice of N.I.M.A.S. JUN 1968

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

LEONARD GOSS, 401 Norman Rd., Camp Hill, Pa. 17011
TOM PEADON, 2907 Hawthorne, Apt. 206, Dallas, Texas 75219
BILL SAUNDERS, 11613 LeBaron Terrace, Silver Spring, Md. 20902

Another Goof

After my listing of mistakes found in the April (March #2) issue, three people wrote to point out that 1.57 x 9:57 (Clarence Mather's Easy B time) was not 13:36 but 15:36. So, a belated and shamefaced congratulations to Clarence - who has received a new certificate proclaiming his winning 1st place in the 1968 Easy B Postal. One friend consoled me by pointing out that the mistakes wouldn't have been found if the paper wasn't read - thanks for reading it!

The Indoor Nats!

The site for the '68 Indoor Nats will be Kansas City Municipal Auditorium, with 125' x 200' floor area and 96' ceiling. All officiating and timing will be done by volunteers, with the time-a-flight, fly-a-flight policy as a backup in case too few helpers show up. As usual with a site having a small floor area, HLG and rubber events will be flown at separate times: HLG from 9 am to 2:30 pm and Rubber from 2:30 pm to 9 pm. If you possibly can help at any time during Sunday, Aug. 4, 1968, please notify Bud Tenny, Box 545, Richardson, Texas 75080.

Recent Publications

Bob Randolph's "Top Cat IV", the story of his "B" model design which held 5 records at the time of writing, breaks the long drouth of indoor articles. It appears in the June '68 M.A.N. with full size plans available as ably drawn by Tom Vallee. The wealth of detail on the plans, coupled with many good hints in the article and detailed building instructions available from Bob make this an outstanding indoor package. Good work!

New Materials!

Krylon, Inc., the spray paint people, have produced a new product which may become almost indispensible around indoor modeler's shops. It is Pressure Sensitive Spray Adhesive, catalog #8010. It greatly resembles rubber cement, and becomes increasingly useful the longer you have it around. Erwin Rodemsky regularly uses it as stickum to cover with microfilm, at some slight weight penalty. In a test where I covered three 25 sq. in. stabs with test film, the average weight of 8010 was .0005 oz./stab. This would become an intolerable extra weight if used on a competitive weight model, but almost unnoticed on a paper ship. This material enabled me to cover two props in one hour flat - 25% of the time normally required. It is the only material I know of which would make it easy to double-cover a prop. Erwin strongly suggests that the material be used outside, where the sticky mist can drift harmlessly away. Also, if you cover a prop, you should mask off the spar with bits of jap tissue.

Micro-X, 5200 Seven Pines Dr., Lorain, O. 44053, found a new covering he calls MicroLite. It is polycarbonate plastic film, 80 microinches thick, and it weighs about half as much as condenser paper. It isn't legal for paper stick, but for demonstration models, ornithopters, indoor scale and possibly some outdoor uses it should be ideal. I will report more on this when I have tested it further.

Rubber Stripper Available

Bob Dunham, 4730 S. Yorktown Ave., Tulsa, Okla. 74105, is set up to make versions of the Bilgri type stripper from plexiglas. These will be complete except for spacers and blade, for $5 each. Those who have constructed one realize this is barely a break-even price, and Bob makes this offer as a service to indoor fliers.

Junior NIMAS Awards

Silver Cat. II HLG Award - 0:34.0, Bobby Dunham

Silver Cat. II HLG Award - 0:38.2, Bobby Hanford

NIMAS Aces

During the recent record trials at Denton, Texas, both Stan Chilton and Bud Tenny made Cat. I Gold Rubber flights to complete their three Award flights to become NIMAS Aces. Chilton's 14:49 and Bud's 13:46 were flights in their seperate efforts to set a World Record. Elsewhere in this issue is given an account of Stan's success.

Plans are being made to provide a special plaque for NIMAS Aces, since no award exists at this time. It will be a while coming, as usual with all NIMAS projects!

NFFS Symposium

The first major technical effort of the National Free Flight Society is scheduled for Monday evening, Aug. 5, 1968, in the Base Theatre of Olathe Naval Air Station. It is shaping up to a very good show, with the list of contributors reading like a Who's Who of American FF. The titles of the papers sound like a summary of all the best from Zaic Yearbooks, and every effort is being made to make the papers technically correct.

The papers will be printed in one volume and will be available for the price of $3.50. Plan now to get one! In fact, plan now to attend the Symposium!

RECORDS? MAYBE!

NORTH TEXAS RECORD TRIALS - May 18-19, 1968 30' 6" ceiling
Ballroom at Texas Woman's Univ., Denton Texas. Cat. I
Open B Stick - 17:03.8, Stan Chilton
Open FAI Cat. I FAI - 17:52.8, Stan Chilton

Possible World Record

Stan Chilton's FAI flight (above) was established under proper conditions for it to qualify as a World Record. All factors such as watch accuracy, site dimensions and other required items have been verified and the flight has been submitted to CIAM. Pending final approval, it is assumed that this flight will be recognized as a World Record.

The flight was the last one of the day, made so late that the timers had to come close to the model to see it land - the site isn't lighted. Stan was pushing the limit on his rubber to get the turns/torque required - he said later that he broke most of the motors he brought!

NEWS FROM AROUND THE WORLD

CZECHOSLOVAKIA

A 12 meter site in Ostrava, Czechoslovakia was the scene of one segment of the Czech national championships. Of the eleven entrants, the top five places were:

Jiri Kalina	16:17	19:50	36:07
T. Weigert	13:53	14:44	28:37
K. Rybecky	12:57	15:37	28:34
Rudolf Cerny	12:23	13:15	25:38
Eduard Chlubny	12:27	12:48	25:15

HUNGARY

Geza Varszegi has been chosen for first slot in the '68 Hungarian Indoor Team, and five other fliers (Biro, Ocsody, Ree, Buzady and Egri) are fiercely competing for the two remaining team positions. Two rounds of team selection have been held in Debrecen, with very poor air for Round I. Two more rounds remain, and final calculation will be made by taking the total of scores from the four rounds and adding each flier's four best starts from all other starts.

ROUND I

Geza Varszegi	25:40	27:00	52:40
Gy. Buzady	15:21	24:55	40:16
Antal Egri	19:40	20:26	40:06

Andras Ree	17:22	19:15	36:37
Karoly Biro	13:47	11:23	25:10
Zoltan Ocsody	10:08	4:40	14:48
ROUND II			
Geza Varszegi	25:29	27:35	53:04
Karoly Biro	26:13	24:58	51:11
Zoltan Ocsody	24:07	26:00	50:07
Andras Ree	20:57	26:27	47:24
Gy. Buzady	17:13	23:45	40:58

MARYLAND - BALTIMORE

The annual indoor meet held by the Baltimore Aero-Craftsmen on April 28, 1968. Times were quite good, considering the lights and rafters. The results:

Junior HLG		Open HLG	
Kenny Dunn	0:47.6	John Thornhill	1:23.8
Francis Fisher	0:25.0	Dan Belieff	1:17.5
B Stick		Easy B	
Dan Belieff	10:32	Rudy Aukschun	8:14
Tom Vallee	9:35	Dan Belieff	7:13
Chester Wrzos	9:28	Chester Wrzos	6:06
Junior Easy B		Indoor Scale	
Raymond Crum	4:55	Nevin Eintline	128 pts.
Francis Fisher	2:22	Rudy Aukschun	118
		W. W. Bell	84

MICHIGAN - DETROIT

86 entries made the annual Michigan State Indoor Meet one of the larger indoor meets this year. Top winners:

Junior HLG		Open HLG	
Charles Kowalski	1:37.0	Bob Bienenstein	1:55.0
Warren Wells	1:04.4	Joseph Macay	1:39.7
Bob Mihora	1:01.0	Phil Klintworth	1:03.3
Junior Paper Stick		Open Paper Stick	
Charles Kowalski	6:30.4	Bob Randolph	17:46
David Wyoych	2:29.0	Ed Stoll	17:09.1
Warren Wells	1:16.5	Jim Richmond	14:48.0
Indoor Stick		Open Scale	
Ed Stoll	21:41.4	Walter Hartung	148.7 pts.
Hardy Brodersen	21:01.2	Jim Richmond	134.3
Bob Randolph	21:00.2	Donald Roberts	132.0

PENNSYLVANIA - PITTSBURGH

268 contestants, 244 of them Juniors and 20 of them girls, made the 4th Annual Indoor Model Air Meet a major and resounding success. 179 entrants in Delta Dart and 84 Junior HLG entrants helped crowd the floor during flying hours and pointed up some need for improved speed of handling of contestants. In all, the meet reflected a net increase of 42%, with a 56% increase in Junior entry. This was an outstanding effort by Pittsburgh modelers as they staffed this meet. Space does not permit listing the winners, since there were 23 separate events.

STATE OF THE ART

Hal Crane's twin bill, two wing designs for a single model, was the holder of the Cat. I C Stick record for a while this spring, until clubmate Hewitt Phillips picked up the same record for himself. The record time was 15:30.2, but somehow I missed which combination did the time. It is of little consequence, since Hal has proven again and again that he is a past master at making time with relatively heavy models in a low ceiling site. Some of his comments about the models are: A model which is about 50% overweight will survive ceiling scrubbing with about 100 or 200 turns backed off from a full Cat. III windup. A climb that puts the model on the ceiling in 30 seconds has been used, but not with the models shown. With .078 x 16" rubber, these models climb to the ceiling (20') in about 45 seconds and stay at the ceiling about 9-10 minutes, landing with about 300 turns out of 1400 at launch (wind to 1500 - back off to 1400). Trim for nose up, slow flight to reduce impact velocity. A twisted wing (washin & washout) gives C-2 a 12' circle, and the increased assymmetry of 654 improves the recovery from the wall. So do the prop spar extensions, which are 1/2" long.

A MICROFILM REPORT

Part I - Testing Methods

Testing and research on microfilm has been continued as I have had time, since the completion of the last series on microfilm in the May '66 issue. Something over 40 sample mixtures have been brewed up from 10 or 12 types of base, and several different plasticizers.

The present series of experiments have been directed toward creating a stable film with adequate strength and minimum static/sticky tendencies. An additional test which is a real "torture test" is the elevated temperature test to check for short-term heat warping, by placing a test panel in a controlled temperature oven. The following tests are performed on each sample:

Pouring test - purely subjective evaluation of the water handling characteristics. Basic objective is to get uniform gold colored film during good pouring conditions. At one time silver film was the standard, but pure silver film can range 2:1 in thickness for the same color - the thinnest bit of silver film is very fragile and subject to shattering - and you can't reliably tell it from good silver film.

Static test - a small triangular flap of film is cut loose with the hoop supported stationary in a horizontal position. Normal air currents in the room will cause the flap of film to wave gently. Film with high static effect will almost immediately "tuck up" accordian-pleat fashion, while static free film will wave for over a minute before the motion eventually builds up a small static charge. In the latter case, the flap generally folds over flat against the rest of the film.

Sticky test - this is also highly subjective, since the flap from the test above is grasped with tweezers and gently pulled loose if possible. Film which is absolutely non-sticky will pull loose without damage even in cases where the static charge is very high. (It is extremely unusual to find zero stick with high static.) Film with a very high degree of stickiness will rupture instead of separate - so the only ratings I assign are usually very low, low, medium and high stickiness.

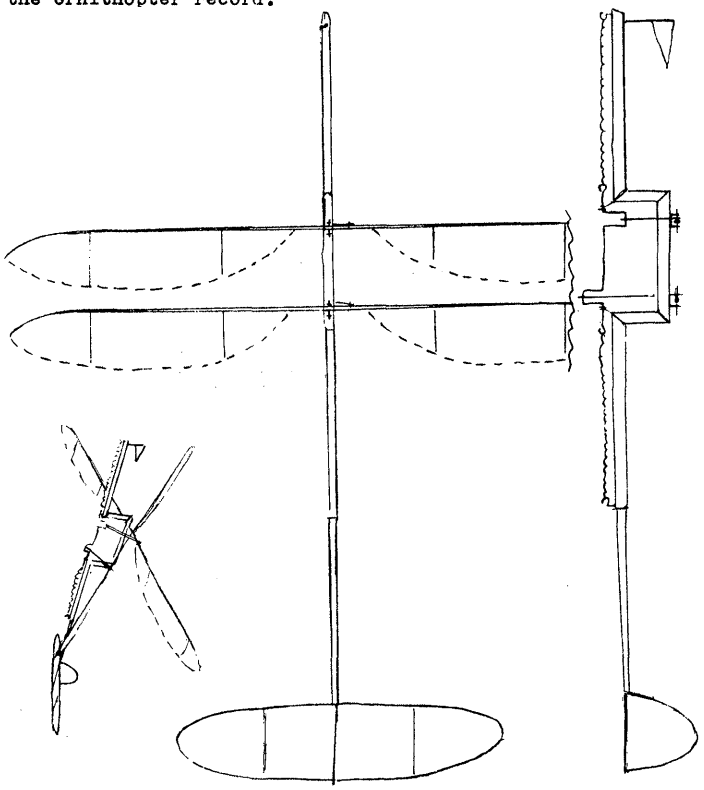
Stability test - a 9½" x 3" stab is covered Bilgri-style with the test film, mounted on a piece of 1/4" square balsa and stored in a closed box. The samples are checked at three month intervals for warps, and samples rated on the basis of how soon serious warps occur. Note that some film samples will pull out most of the wrinkles, but won't have enough pull to warp even fairly light surfaces.

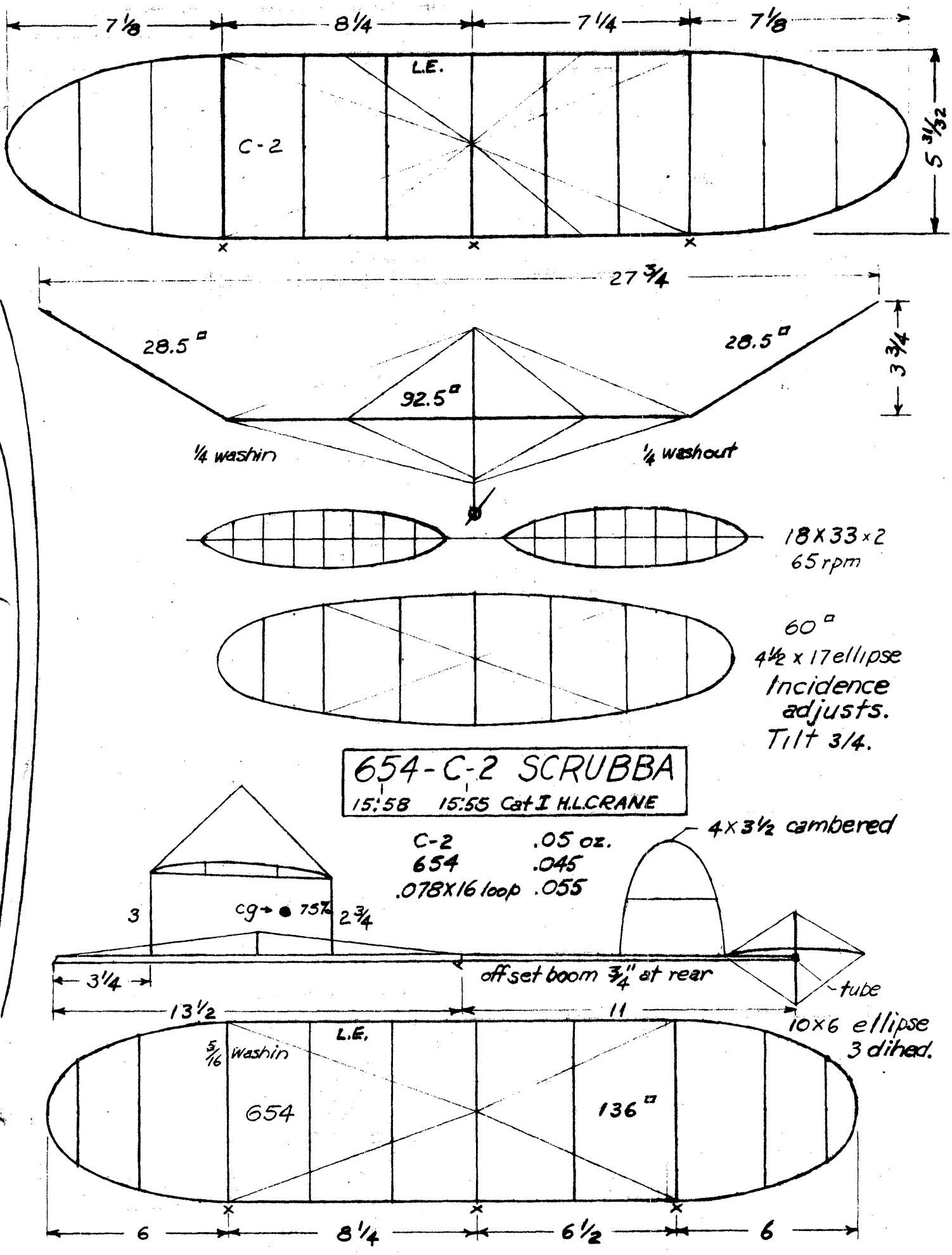
Elevated temperature test - samples like the stability test panels are mounted in an electronically controlled oven and raised to some high temperature for 24 hours, then allowed to cool. Only one sample has had the full course, and it survived to 160° F. with only minimum warping. With no established history on various types of film, 160° F. has little real meaning, but it sounds impressive!

Very high humidity has hampered much planned experimentation all this year, but future issues will summarize some completed experiments and give "recipes" of successful film solutions.

CHANGE OF PACE

Hewitt Phillips sent in the sketch below, which portrays the essential features of an ornithopter design he flew several years ago. The chief feature of this flapper arrangement (each flapper teeter-totters out of phase with the other) is smooth application of power. Hewitt's model flew well even though it was overweight and small. He feels it might be a good design for future attacks on the ornithopter record.




7 1/8
8 1/4
7 1/4
7 1/8
L.E.
C-2
5 3/32
27 3/4
28.5°
28.5°
92.5°
3 3/4
1/4 washin
1/4 washout
18 X 33 x 2
65 rpm
60°
4 1/2 x 17 ellipse
Incidence
adjusts.
Tilt 3/4.
654-C-2 SCRUBBA
15:58 15:55 Cat I H.L.CRANE
C-2 .05 oz.
654 .045
.078X16 loop .055
4X3 1/2 cambered
3
cg
75%
2 3/4
3 1/4
offset boom 3/4" at rear
tube
13 1/2
11
10x6 ellipse
3 dihed.
L.E.
5/16 washin
654
136°
6
8 1/4
6 1/2
6

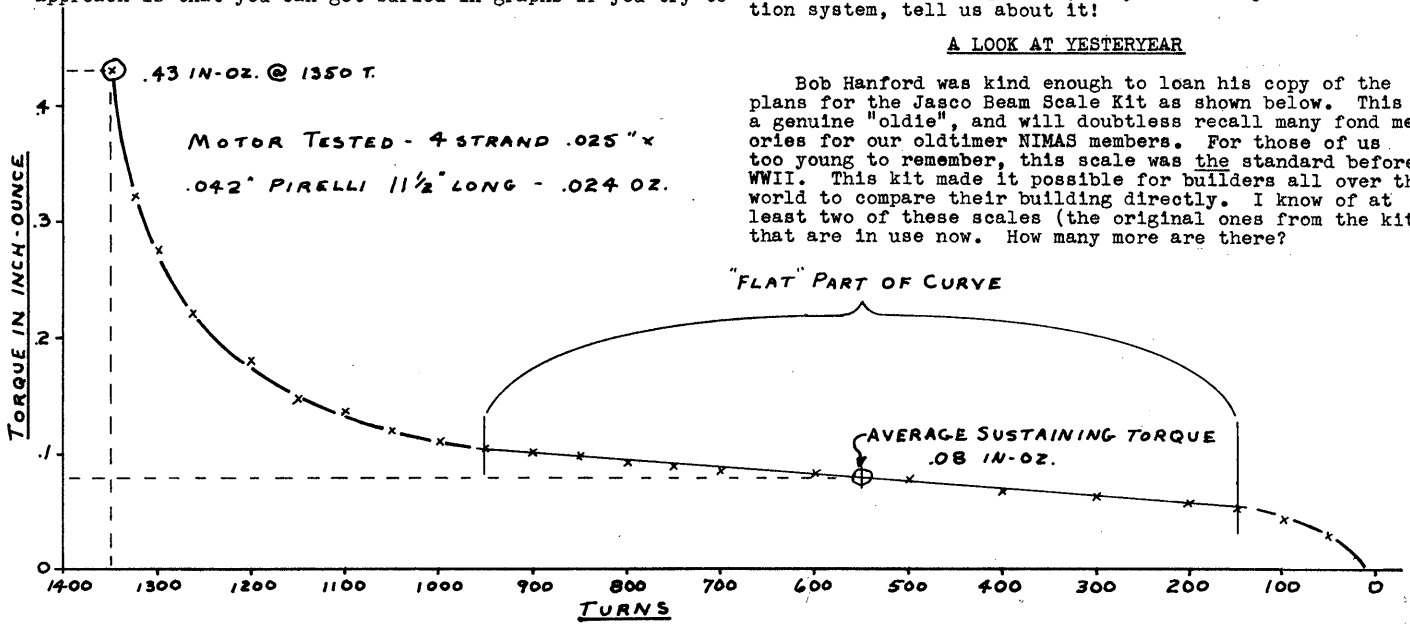
THE LAB

Rubber Torque Tests

Several people are making intensive studies of pirelli rubber, with the goal of identifying extra good rubber for indoor use. All the various tests will be reported as this info is made available, and anyone with what they consider to be a valid test for rubber quality is requested to submit a report on the test.

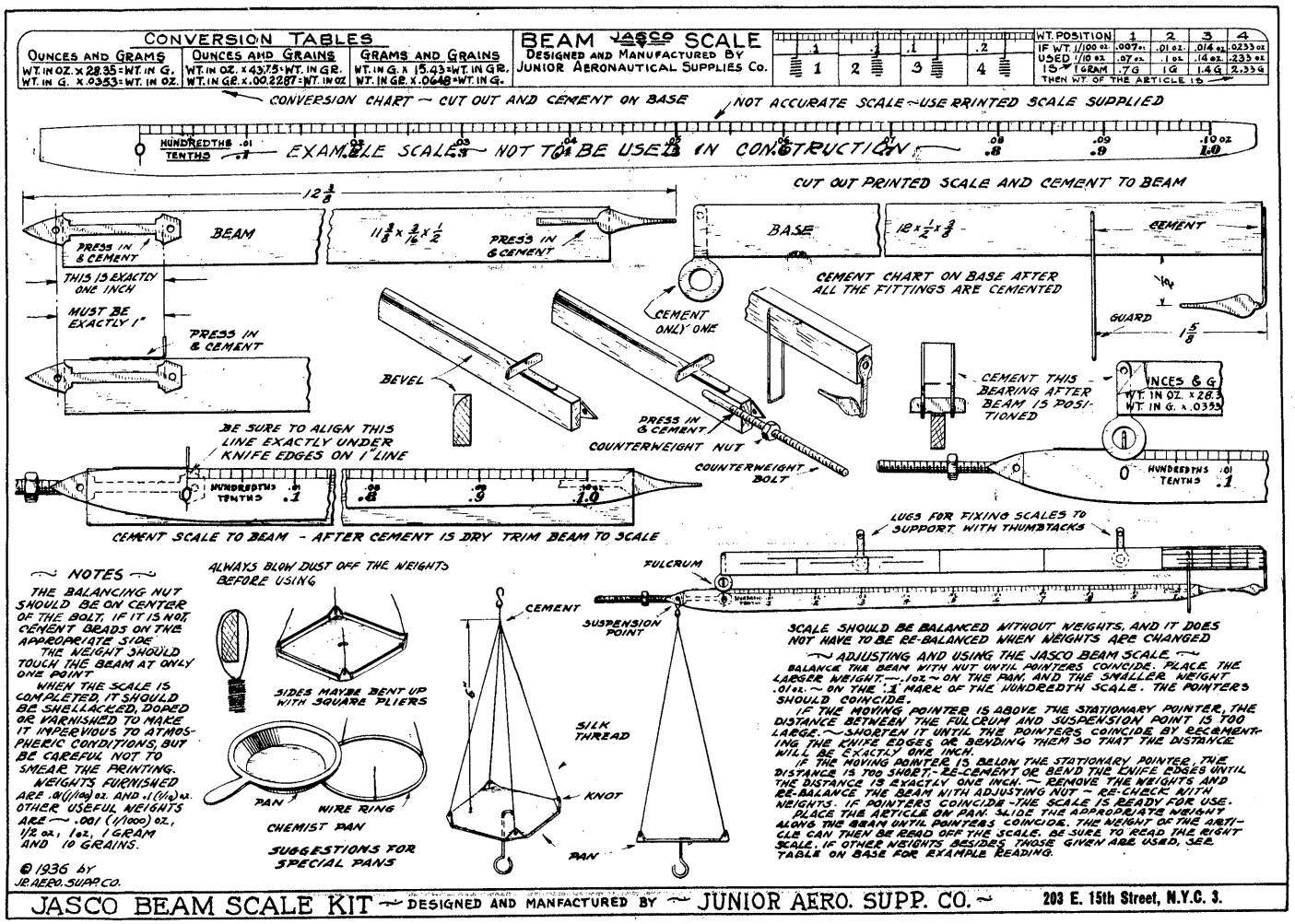
Meanwhile, a torque test (plot of torque vs. turns) is proving to be a good test of how much energy a given piece of rubber will deliver. One major difficulty with this approach is that you can get buried in graphs if you try to carry them all to the field. To help reduce a graph to a few numbers to jot on the envelope you put the motor in, I offer the following suggestion. The graph below has had a straight line superimposed on the flat part of the curve, and end points of this line are established by noting the points where the curve deviates from the line. Another point well up on the high energy part of the curve is marked for identification (.43 in. oz. @ 1350 turns).

I propose that motors be identified with the high torque point and the value of the midpoint of the line segment (1350/.43; .08). In effect, this will serve as a definition of average sustaining torque, and this term will be used in future comments on rubber in INAV. Comments on this proposal are requested; if you have a pet classification system, tell us about it!



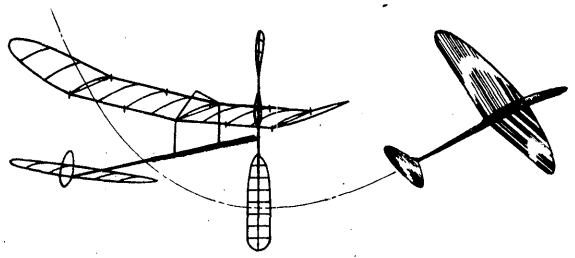
A LOOK AT YESTERYEAR

Bob Hanford was kind enough to loan his copy of the plans for the Jasco Beam Scale Kit as shown below. This is a genuine "oldie", and will doubtless recall many fond memories for our oldtimer NIMAS members. For those of us too young to remember, this scale was the standard before WWII. This kit made it possible for builders all over the world to compare their building directly. I know of at least two of these scales (the original ones from the kit) that are in use now. How many more are there?



The Voice of N.I.M.A.S. JUL 1968

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

Dr. LEIGH SIMPSON, R.D.#3, Fulton, N. Y. 13069
TED WHYTE, Reservoir Rd., Fulton, Md. 20759

The Indoor Nats

The indoor section of the 1968 Nats will be held in the Kansas City Municipal Auditorium, 1310 Wyandotte, Kansas City, Mo. from 9 am to 9 pm on Sunday, Aug. 4, 1968. Hand launch glider will be from 9 am to 2:30 pm, and the rubber events will then run until 9 pm. All HLG fliers are requested to promptly clear the floor at the end of their session in order to enable the rubber fliers to safely unpack their models. During all the rubber flying, all contestants are requested to stay clear of the flight area. Once you launch it, all you can do is pray - unless you abort the flight with a balloon, so please help keep the air quiet for the benefit of models landing.

An attempt was initiated to obtain the site an extra day for a Cat. II Record Trials. No word has been received on this, and it must be considered that there will not be extra flying time. However, in case late word comes through, I will notify anyone who is interested. Please notify Bud Tenny, Box 545, Richardson, Texas 75080 if you want to receive notification.

NIMAS Charts

In the May '68 issue I announced that highly durable copies of various charts and graphs published in INAV would be made available. A fairly large number of these charts have been ordered, and production has been held up until this week. All orders currently on hand should be filled before the Nats, and a few of these may be available from me at the Nats. For those desiring more info, send a stamped envelope for zerox copies of the full size art work. The charts in production are:

1. RPM/Time - April '68 INAV - 85¢
2. Pirelli Parameters - Mar. '68 - $1.00
3. CG Location - May '67 - $1.10
4. Arc Thickness Nomogram - Feb. '67 - $1.20

The initial comments on this special metal process suggested that trophy plates could be custom made for a price competitive with plain engraved plates, provided the required art work could be generated by the user. Those who requested further information were somewhat discouraged by the art work requirement, and only one club has ordered plates. A sheet of artwork has been worked up and is available for 15¢ per sheet. You can obtain a preview of the artwork (xerox copy) by sending a stamped envelope along with your request.

Recent Publications

The August issue of American Aircraft Modeler has an article which should be of interest to indoor fliers who care about their pirelli. "Rubber Motor Testing", by Jim Horton, dovetails nicely with material to be presented in INAV in issues to come. The particular part of interest to indoor fliers is Horton's break-in method. It may well be adaptable to indoor motors, and appears to be a valid break-in method which should give equivalent break-in with less chance of chafing the motor as often happens with break-in by winding.

Junior NIMAS Awards

Silver Cat. II Rubber Award - 18:19, Bill Gibbs

Silver Cat. I Rubber Award - 8:23, Bill Gibbs

Silver Cat. I HLG Award - 0:21.4, Bill Gibbs

Gold Cat. I HLG Award - 0:25.5, Bill Gibbs

Diamond Cat. I HLG Award - 0:27.2, Bill Gibbs

Junior Ace

As can be seen by Bill Gibbs' monopoly on NIMAS Awards this month, he has qualified as the first Junior Ace. It is not unusual for Bill to turn in outstanding performance in Indoor, since he carried home four Nats Indoor trophies last year. I understand Bill will attend the Nats this year, so he may well add more Awards to his Cat. II string.

As a reminder to NIMAS Juniors and family members, the Junior Award times are roughly 75% of Open times:

Indoor Stick (Any class indoor model, single flight)

AWARD	Cat. I	Cat. II	Cat. III
Silver	7:30	15:00	21:00
Gold	9:30	18:45	26:30
Diamond	11:15	22L30	31:30

Indoor HLG (Best single flight of nine)

AWARD	Cat. I	Cat. II	Cat. III
Silver	0:18	0:34	0:41
Gold	0:22.5	0:41	0:49
Diamond	0:27	0:49	0:56

RECORDS? MAYBE!

AKRON RECORD TRIALS - June 23, 1968 90' ceiling - Cat. II
Goodyear Hangar, Akron, Ohio
Sr. AMA Cat. II FAI - 14:38, J. Serviates
Open A ROG - 15:53.2, Joe Hindes
Open C Cabin - 18:29.0, Bob Randolph
Open Ornithopter - 5:15.2, Ken Johnson

Possible World Record

Hard on the heels of Stan Chilton's record flight comes the announcement that Jiri Kalina, previous holder of the Cat. I World Record, has applied for a new record on the basis of a flight of 19:12 on June 15, 1968. For those interested in chasing this record, a World Record has to be exceeded by 2%. The next record jump will need to be to 19:35.

REPORT FROM CZECHOSLOVAKIA

Walter Erbach attended the International meet held in Brno, Czechoslovakia on July 6-7, 1968. He reports:

The Czechs were magnificent hosts. Competition was spirited but clean - with only official flying the floor was clear and no racing around. Prizes included beautiful Czech cut glass.

The contest was a two-day affair, held in the pavilion of the Brno display grounds. This is an area similar to our (U.S.) state fair grounds. The pavilion is circular with a vertical wall about 60' high, topped by a dome with a cupola in the middle. The highest point is 120', and the diameter is 300'. Unfortunately, incredible drafts prevent use of the upper 1/3 of the altitude. Any model flying near the cupola was sucked up (open vents) and shredded or spit out in pieces. Any model within 10' of the curved dome ceiling was almost a sure goner due to the chimney effect from open holes at the base of the dome.

The contest was very interesting; European style. Test flying was permitted only early in the morning, and only official flights during the day. This made it hard to know proper adjustment or rubber size. Despite this, and the building handicap, the flying was very good with four flights over 30 minutes. Competitors came from Germany, Austria and Italy, with three ladies: Dagmar Chlubna and Miluska Zolcer from Czechoslovakia and Ludovica Corazza from Italy. The results:

1.	Jiri Kalina	Czech.	31:11	32:24	63:35
2.	Karol Rybecky	Czech.	28:55	30:33	59:28
3.	Eduard Chlubny	Czech.	28:46	30:03	58:49
4.	Hans Beck	Germany	27:37	29:10	56:41
5.	Juraj Sitar	Czech.	28:16	23:55	52:11
6.	Rudolf Cerny	Czech.	26:32	25:12	51:14

STATE OF THE ART

ROULETTE - Indoor Autogyro

This Model's performance on June 11, 1968 represented the fulfillment of a long quest. It began eight years ago with experiments that resulted in the design of "Mr. G", published in Nov. '62 INAV. A similar, but larger model called "G-III" was presented in Zaic's '65 Year Book.

"Roulette" is a direct descendent of "G-III", but the rotor mast was moved to the end of the stick to prevent the blades from hitting the wing. Also, more sophisticated construction was used; braced stick and tail surfaces, double thrust bearing and rounded tips. The result is a light weight model of the type which has become necessary due to the advance in autogyro times in recent years.

The flight system is still the same as for "Mr. G", with offset rotor to counter prop torque. Rotor tilt has been added to increase the anti-torque forces, allowing the use of a large prop and left turn. This combination gives sufficient torque correction to insure a fairly steep climb.

Even with this setup there is a limit to the power the model will handle without stalling. It is necessary to back off a few turns or catch the model and re-launch if it stalls badly. After that, it climbs smoothly. On the record flight it reached a height of 75-80 feet, which was just right for the peaked 107' height of Hangar #2.

Thanks are due to Ed Franklin for his help with the motor, and to Bill Bigge for his advice on hall air conditions.

by Fred Weitzel

NEWS FROM AROUND THE WORLD

AUSTRIA

Manfred Koller is training hard toward the World Champs in October, in addition to coaching indoor fliers in Vienna. His own Cat. I time has climbed to 15:01 for a new Austrian record. In a 12 m site he has done 18:33 without touching the ceiling, and at Debrecen he made flights of about 25 minutes.

ITALY - ROME

The first round of team selection for the Italian Team was held in Palazzo dello Sport (the WCh site) and drew 12 entrants. The results:

E. Corazza	21:31	19:44	41:15
C. Cotugno	20:52	18:53	39:45
G. Masciullo	20:12	19:29	39:41
L. Chiarottini	17:29	16:40	34:09
B. De Angelis	16:48	16:22	33:10
G. Federici	16:31	15:48	32:19

ROMANIA

The April International Contest in Romania brought out 30 contestants, with 5 coming from Czechoslovakia and 2 from Italy. The site was the large salt mine (75 m ceiling and 50 m x 100 m floor area) near the Carpathian mountains. The temperature is a constant 10° C., and there were a few light drafts to contend with. Two flight totals:

Jiri Kalina	Czechoslovakia	57:41
K. Rybecky	" "	47:09
J. Sitar	" "	41:59
Dagmar Chlubna	" "	40:54
Egizio Corazza	Italy	39:18
N. Besman	Romania	37:40
Eduard Chlubny	Chechoslovakia	36:16
Otto Hintz	Romania	35:32

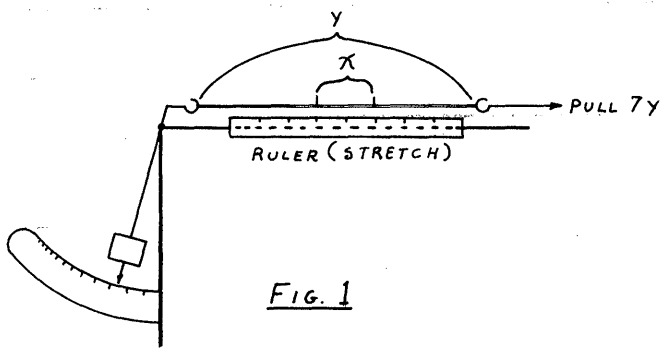


FIG. 1

THE LAB

Another Rubber Test

The May '68 INAV summarized briefly a test devised by Charlie Sotich. For review, Fig. 1 below shows this test schematically. The scale at the left reads force, while a ruler held next to the 1" segment (x) (which was marked on the unstretched sample) measures how much the marked segment stretches as the whole piece (y) is stretched to seven times normal length in six equal steps.

Considerable discussion between Charlie and myself has resulted in design changes for the basic machine as shown in Fig. 2 below. Cam "A" on the left was designed by Charlie so that its angular rotation is directly proportional to the force applied. Drum "B" on the right is used to wind up cable "C", which applies stretch force to the rubber; its rotation is already proportional to the amount of stretch except for a small error introduced by movement of the force hook (Δl).

A potentiometer is mounted to the shaft of the cam and a multi-turn potentiometer is mounted on the take-up drum. (For you non-electrical cats, a potentiometer is a variable resistor like the volume control on a radio.) The circuit in Fig. 3 shows the electrical schematic. R1 is the force potentiometer, R2 is the potentiometer which produces a voltage proportional to the amount of stretch, and R3 can be set to minimize the error due to Δl. In use, the motor is hooked up with zero slack and the position of the drum and cam set so the potentiometers R1 and R2 are zeroed. As the drum is turned, the amount of stretch can be read from voltmeter V2 and the force from V1. If you use a tape recorder, you can conduct the test by yourself by reading out the voltages at each stage of the test. You can then graph the test as you play back the tape. If anyone is interested in this type of test, I will supply more information on request.

This rig is slightly more complex than Charlie's, with these aims in mind:

1. A complete motor is tested as a loop. This provides a means to classify each motor according to output and will help insure that you use the poor rubber to hold the lid on your box instead of flying with it.

2. The basic tester is designed to minimize certain errors inherent in this type of testing. First, possible weighing errors are magnified when small pieces of rubber are used - this unit uses three times as much rubber as Charlie's unit. Second, the testing is reduced to a mechanical routine that can be repeated quickly and uniformly. This minimizes some error caused hysteresis effects in the rubber; that is, if the test takes substantially longer one time than another, the rubber takes a temporary "set" proportional to the time force is applied.

3. If you have access to a laboratory X-Y plotter, it is possible to trace out the energy curve directly and continuously; an entire test can take as little as 2 minutes. To use a plotter, replace the voltmeters in Fig. 3 with the plotter input leads.

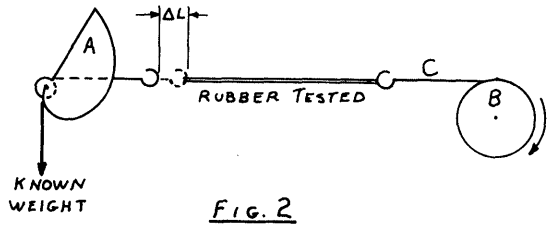


FIG. 2

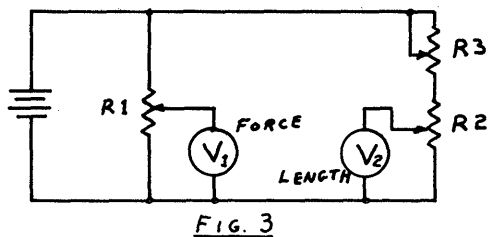


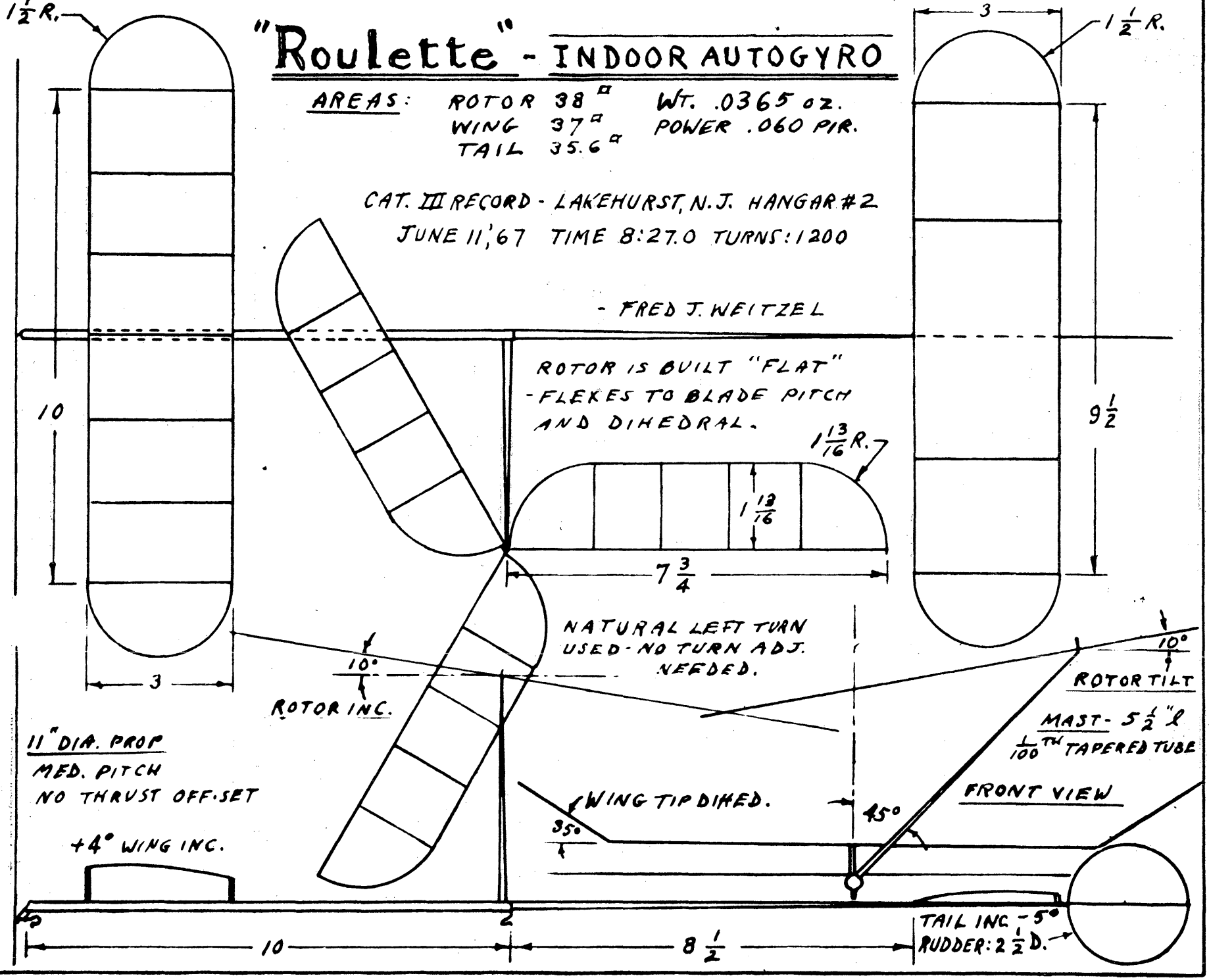
FIG. 3

"Roulette" - INDOOR AUTOGYRO

AREAS: ROTOR 38 □ WT. .0365 oz.
WING 37 □ POWER .060 PIR.
TAIL 35.6 □

CAT. III RECORD - LAKEHURST, N.J. HANGAR #2
JUNE 11, '67 TIME 8:27.0 TURNS: 1200

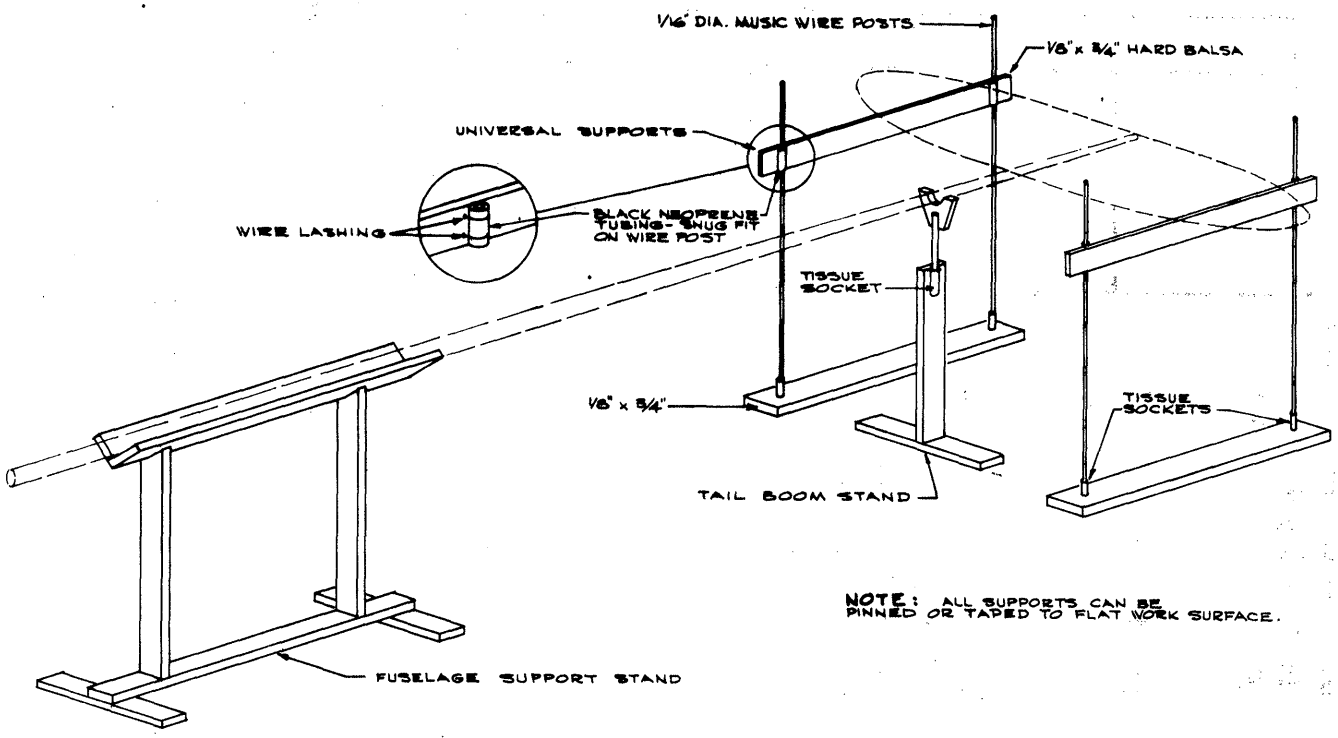
- FRED J. WEITZEL



FDW '67

MODEL ASSEMBLY JIG

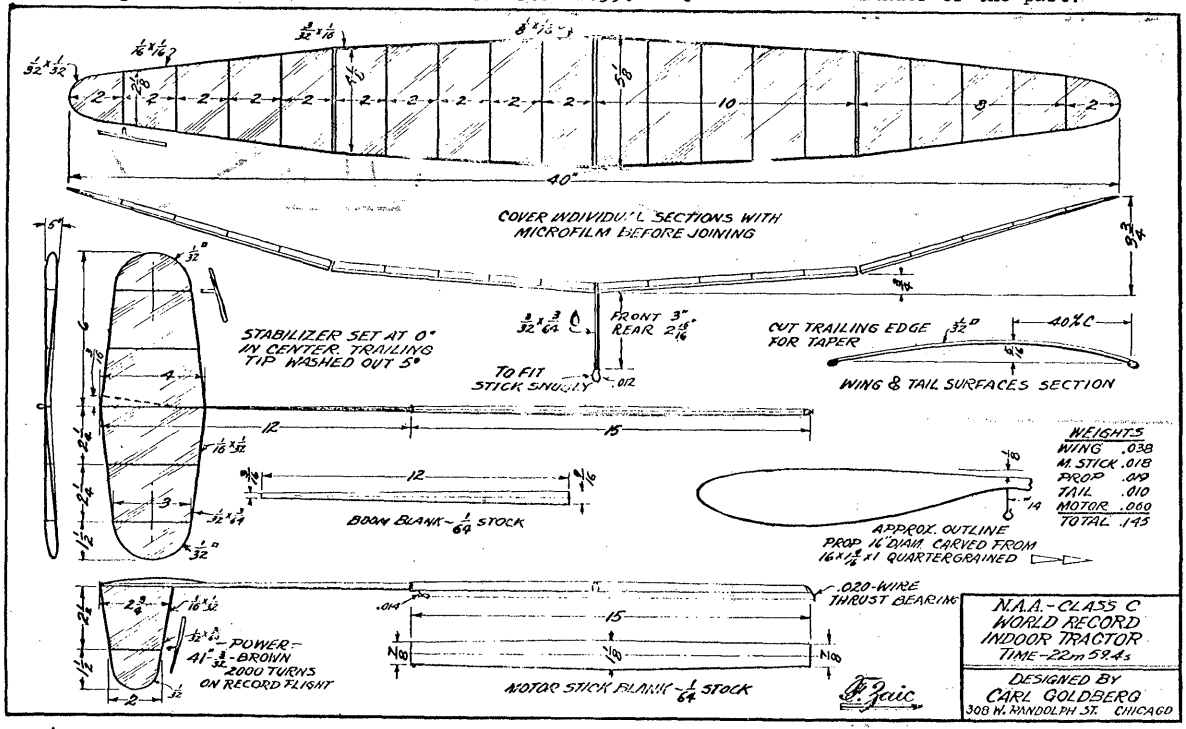
Very light indoor models are a problem to assemble with proper alignment - even very quiet rooms have air currents to give trouble. The set of jigs shown below makes the job much easier. Details of the universal supports are shown below and in Fig. 5 of the bracing article in the Oct. '66 INAV; and details of the other stands will be furnished on request. The jigs can be set up on any flat surface, either pinned to the work surface or held in place with cellophane tape. The fuselage is held level by one jig, while all combinations of boom incidence, stab tilt and washin/washout can be held by the other jigs. All the jigs will pack into a small space to permit field repairs or re-rigging.



FUSELAGE AND BOOM ASSEMBLY JIG

A LOOK AT YESTERYEAR

Carl Goldberg was a pioneer of indoor model flying, and a real pacesetter also. This glimpse into the past shows Goldberg's World Record model which flew for 22:59.4 in a site just over 100'. Note the weights shown on the plan - and compare this to Class C weights today. The Cat. II C record is 29:21.5, but have we really advanced so much in 32 years? Thanks to M.A.N. for permission to present this reminder of the past!



The Goldberg World Record Model

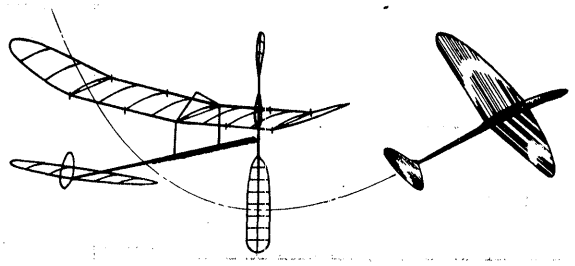
THIS month's N.A.A. model plan is of the ship with which Carl Goldberg established the world record indoor flight of 22 minutes 59.4 seconds at the 1934 National Championship Meet in the Goodyear-Zeppelin Air Dock at Akron, Ohio.

This flight is the longest ever made officially indoors and might easily have been surpassed had Carl elected to try a second or third flight. However, he made only one flight and the present record was the result. This model is of such merit that it might serve as a guide for indoor enthusiasts for years to come. The N.A.A. is fortunate, indeed, to be able to offer Goldberg's design to its junior members.

Carl promises to attend this year's meet in St. Louis and reports that he has a few improvements on his present design and hopes to show a longer flight than 25 minutes. For the benefit of those who may want to write him his address is now, 308 W. Randolph St., Chicago, Ill.

The Voice of N.I.M.A.S. AUG·1968

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

RESULTS FROM THE 1968 INDOOR NATS

Indoor Stick

Junior

*1.	Linda Randolph	18:44.5
2.	Bobby Dunham	15:23.0
3.	W. Schlarb, Jr.	12:21.0
4.	Kristi Tenny	11:05.5
5.	Gerry Geraghty	9:40.5
6.	Bill Gibbs	8:36.6

*Linda's best flight may be 23:12.1; she was using a Class C sized FAI model.

Senior

1.	Jan Serviates	14:39.4
2.	Art Markiewicz	13:33.9
3.	Susan Weisenbach	7:32.7
4.	Hank Nixon, Jr.	6:36.6
5.	T. J. Rodgers	3:05.0

Paper Stick

Junior

1.	Linda Randolph	15:30.5
2.	Gerry Geraghty	12:52.7
3.	Bobby Dunham	11:51.9
4.	Bill Gibbs	11:07.2
5.	T. Budding	10:56.8
6.	R. Sherman	9:06.5
7.	B. Webster	8:19.0
8.	Patrick Wood	8:03.2
9.	Steve Valerius	7:26.3
10.	J. Haught	7:00.6

Senior

1.	Jan Serviates	12:41.0
2.	D. Domina	9:34.5
3.	D. Powell	6:19.0
4.	Susan Weisenbach	4:46.5
5.	Hank Nixon, Jr.	4:05.9
6.	T. J. Rodgers	2:36.0

Indoor Cabin

Junior

1.	Bobby Dunham	11:58.4
2.	Bill Gibbs	11:58.0
3.	Patrick Wood	5:58.1
4.	Michael Wood	4:22.5
5.	W. Schlarb	3:44.0
6.	Bruce Paillet	3:04.5
7.	Barry Paillet	2:40.4
8.	Justin Mills	1:27.3
9.	James Mills	1:21.4

Senior

1.	Jan Serviates	14:02.0
2.	Susan Weisenbach	3:37.0
3.	Thomas Mills	1:15.2
4.	M. R. Richardson	1:12.0

Indoor HLG

Junior

1.	Bill Gibbs	2:04.9
2.	Bobby Dunham	1:50.8
3.	M. Thompson	1:48.8
4.	D. L. Dock	1:44.2
5.	Bobby Hanford	1:33.1
6.	R. Sherman	1:30.6
7.	Veselsky	1:28.0
8.	M. Kerr	1:27.9
9.	James Mills	1:23.9
10.	Gerry Geraghty	1:23.6

Senior

1.	A. Markiewicz	2:10.6
2.	Jan Serviates	2:00.7
3.	Thomas Mills	1:48.2
4.	D. M. Wakerly	1:40.2
5.	M. Richardson	1:36.9
6.	W. Rupert	1:36.3
7.	C. Taft	1:24.1
8.	G. Brown	1:22.2
9.	G. Meyers	1:22.1
10.	Hank Nixon, Jr.	1:19.1

Open

1.	Jim Richmond	31:07.8
2.	Manny Andrade	28:08.3
3.	Ed Stoll	27:22.5
4.	Al Rohrbaugh	26:33.3
5.	Bud Romak	25:59.1
6.	Bob Randolph	25:56.2
7.	Bud Tenny	24:16.0
8.	Stan Chilton	22:27.0
9.	Paul Tryon	20:18.0
10.	Hardy Brodersen	19:29.0

Open

1.	Bob Randolph	18:40.0
2.	Dan Belieff	18:35.5
3.	Wally Mumper	18:34.6
4.	Phil Klintworth	17:41.0
5.	Charlie Sotich	16:48.0
6.	Wayne Zink	15:07.0
7.	Hal Crane	14:11.5
8.	Al Rohrbaugh	14:03.5
9.	Dick Ganslen	14:00.0
10.	Jim Vale	13:47.8

Open

1.	Bucky Serviates	20:08.5
2.	Al Rohrbaugh	19:36.0
*3.	Bob Randolph	19:18.0
4.	Manny Andrade	18:11.4
5.	Hal Crane	13:21.0
6.	Jim Vale	10:00.0
7.	Wayne Zink	:02.0

*Randolph's model was later declared ineligible by the Free Flight Contest Board.

Open

1.	D. A. Reed	2:10.6
2.	Bob Larsh	2:09.4
3.	Jim Mills	2:04.8
4.	Dick Mathis	1:58.7
5.	G. M. Lee	1:57.8
6.	Bucky Serviates	1:57.7
7.	Bob Sifleet	1:54.2
8.	A. L. Vaughn	1:53.6
9.	R. L. Young	1:53.2
10.	J. H. Gremel	1:53.0

The Indoor Nats

NIMAS and NFFS banded together for their first joint venture - hosting the 1968 Indoor Nats. If one can say there was any failure, it could only be around 7 pm, when the system of volunteer timers grew thin. Inspired timer recruiting by John Thornhill helped bridge the gap and probably everyone got flights who would have with the Navy timing crews of past years. What really happened was that faithful NIMAS members (rubber fliers) timed HLG, but not many HLG fliers stayed to help time rubber flights. A few NIMAS members who weren't flying and some very faithful NFFS members carried the slack for those who cut out.

I wish it would be possible to name everyone who did the timing - the list is truly long. Smooth operation of the desk was due to long, steady work by Roger W. Schroeder of Holbrook, Nebraska and Roger J. Schroeder (both are NIMAS and NFFS members) of Overland Park, Kansas. Recording of scores was handled by Carolyn and Fred Schroeder (son and daughter of Roger J.). After spending all day to audit the HLG scores, Tem Johnson CD'd the rubber events. We all owe these and the timers a big vote of thanks!

Although the Sweepette was still in evidence in HLG, a new breed of glider was making inroads into the winner's circle. This is a big glider - 65 to 75 sq. inches of wing. The largest ones were flown by Bob Hanford - 100 sq. inches - but he didn't get zeroed in in time. Larsh's Bunker Hill glider was a small one that did well, and Bob got an optimum pattern early for 2nd place. With only 17 seconds spread in ten places, Open HLG was hard-fought. A minor flurry of interest came when an unidentified flier presented a built-up glider covered with saran wrap. It was not a floater, because it got heaved to the top many times.

The most encouraging thing about the rubber events was the large number of youngsters who flew - more than 40 in contrast to only 28 Junior and Senior rubber fliers last year. The times turned by these fliers were slightly better than in past years also - a "plus" all around.

Open competition was quite close in all events, but Jim Richmond took Indoor Stick effortlessly with a three minute margin - the first Cat. II "30" ever at a Nats. This was the first full-bore flight on one of his World Champs models - things are looking up for the U. S. Team in October! Randolph's win in Paper Stick was hard-pressed by his own design - Dan Belieff was also flying Top Cat IV as built from the M.A.N. article. Another very close race was Indoor Cabin, with Bucky Serviates leading to get first with an original model that flew very well.

Considerably more attention was paid to torque input in the rubber events - about a dozen torque meters were in evidence around the hall, including one to measure torque directly from the prop.

The jarring note of the meet was persistent and highly variable drift which prevented many models from showing their worth. Most of the drift took models into bleacher areas for relatively safe retrieval, but very high "blind" ledges claimed some models that were not recovered. The other hazard which worked hardship was midair collisions. At least two three-way collisions were noted, and one time a model which was dislodged from the ledge fell on another model. If the Tenny family experience was typical (surely not!), no one had many safe flights. Of nine attempts, we had four midair collisions and four landed in the balcony.

The Lighter Side: Early in the rubber session, a young boy who had generally been a nuisance kept up his warting ways. Several fliers shooed him away, but Jim Vale ejected him, squirming and squealing, from the site to a chorus of muted cheers of the bystanders! - - - One tired and sweating (the humidity and temperature were very

high) volunteer timer was heard to mutter "Now I remember why I don't like Indoor!" - - - One flier, winding on his torque meter, reaped many comments. "I never saw anyone wind up a table before!" "You won't get much time with that!" "I'll bet you don't get it off the ground!" - - - Jean Paillet eyed Jody suspiciously as she stood by with a camera. He remembered the Chicago Nats when her exploding flashbulb shattered everyone's composure as she took their picture in 1966!

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

JOHN B. CROSETTO, JR., 14809 S. E. 54th, Bellevue, Wash. 98004

JACK KOEHLAR, 1231 Wayne, Topeka, Kan. 66604
ED LIDGARD, 18570 San Jose, Lathrup Village, Mich. 48075

NFFS Symposium

If you missed the NFFS Symposium, you goofed! Not only was it an outstanding program, but the centerpiece of the presentation was "The Long Flight", filmed by Herb Franck. This movie has been a long time coming, but it was worth twice the wait if necessary. I would willingly view it many times more; it captures solidly the elusive feeling we all have had as we realize the magnificence of free flight for the first time. More important, it will communicate this feeling to those who have not tried free flight.

If you did not order (or buy in person) a copy of the Symposium Report, you can get a copy from AMA HQ by sending them $3.50. Several of the papers published there deal with propeller theory, Wakefield props in particular, and other topics are covered also. One indoor paper, by Bud Tenny, is entitled "Choice of Rubber Motor For Low Ceiling Indoor", explains one method of rubber choice using graphical solutions of flight parameters.

NIMAS Awards

Diamond Cat. I Rubber - 15:02, Bob Platt

Diamond Cat. II Rubber - 31:07.8, Jim Richmond

NIMAS Aces

Add to the list of Aces Bob Platt (Diamond Award listed above) and Tom Vallee (his Diamond Cat. I Rubber Award announced in May '68 INAV). This makes a total of eight Open Aces and one Junior Ace.

New Materials!

Last month's mention of Krylon spray adhesive caused Dave Linstrum to point out that 3M has marketed a similar product called Spray-Ment Adhesive. The Krylon product is not often available at dealers featuring Krylon paint, but both products should be available at office suppliers.

Indoor Films

Response to the initial announcement of Joe Poloso's new color movie of Lakehurst action was sufficient to tie it up for a while. If you would like to see this movie, send a card to get on the waiting list. It covers, with Joe's excellent technique, most phases of indoor flying. This one has been edited and has subtitles which add meaning to the action for those not acquainted with East Coast indoor personalities.

RECORDS? MAYBE!

A number of official Nats flights exceeded records, but I have certain knowledge of only the following record applications being made:

Open AMA Cat. II FAI - 31:08, Jim Richmond
Junior B Stick - 15:23.0, Bobby Dunham
Junior B Cabin - 11:58.4, Bobby Dunham

The following flights exceeded records; applications may have been filed:

Open HLG - 2:10.6, D. A. Reed
Open C Cabin - 20:08.5, Bucky Serviates
Junior Paper Stick - 15:30.5, Linda Randolph

The Nats results listed elsewhere possibly contain at least one error - 18:44.5 as first place in Junior Stick. Thru an oversight during the auditing procedure, a 23:12.1 flight (also by Linda Randolph) was missed. Add to this her second best Paper Stick flight (14:41) and the following records will probably be applied for:

Junior C Stick - 23:12.1, Linda Randolph
Junior B Stick - 14:41, Linda Randolph
Jr. AMA Cat. II FAI - 18:44, Linda Randolph

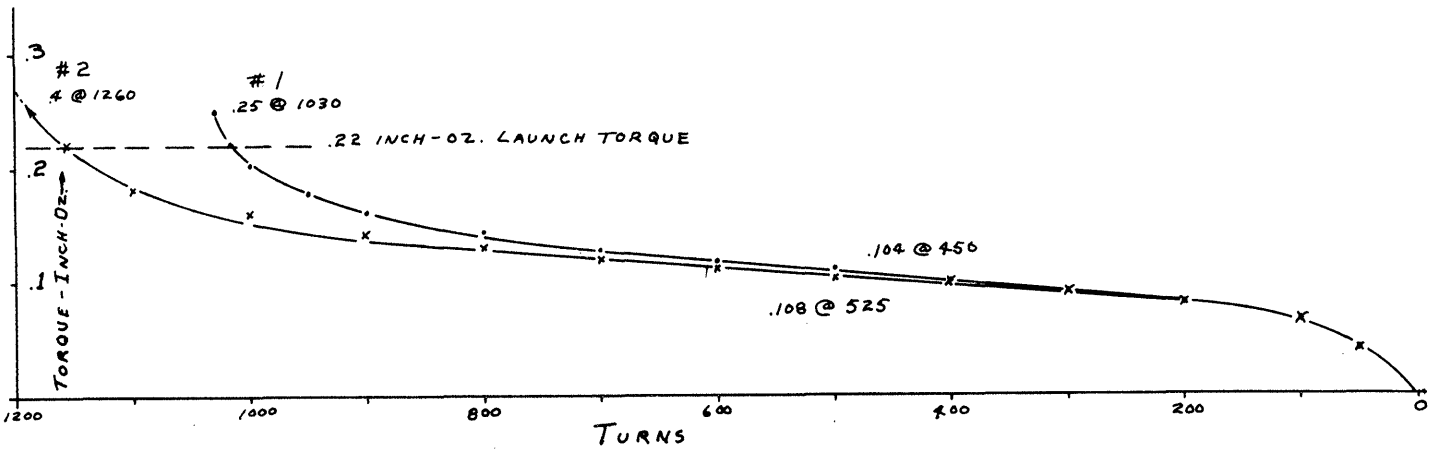
CONTEST CALENDAR

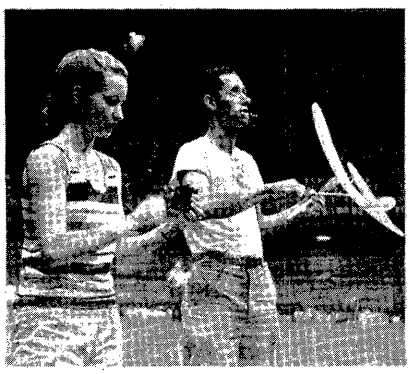
OHIO - Akron. Possible record trials in 215' Goodyear hangar. Contact Bob Randolph, 5785 Forest Ridge Dr. N. Olmsted, O. 44070 for info.
NEW JERSEY - Lakehurst. Record Trials Sept. 16, 1968. Contact C. V. Russo, 143 Willow Way, Clark, N.J. 07066 for more info.
NEW YORK - Long Island. LIAMAC 1st Annual Indoor Model Meet at Cantiague Park Skating Rink, Hicksville, L. I. Indoor Stick, Paper Stick, HLG, Easy B (paper covered only for Jr. only). CD Bill Dunwoody, 985 Fort Salonga Rd., Northport, L. I., N.Y. October 20, 1968. Site is 190' dia. dome w/50' ceiling in center.

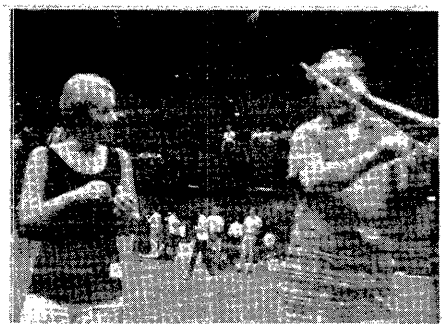
PIRELLI LORE

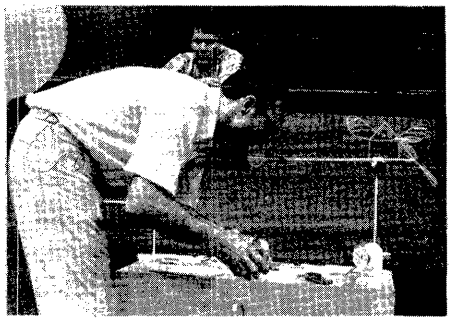
In the May '66 INAV, the QUESTIONS AND ANSWERS column listed some very comprehensive questions about pirelli; storage, break-in, winding techniques and general care of pirelli. No really satisfactory answers were ever forthcoming and the questions remain largely unanswered. This column will offer bits and pieces of information about pirelli, as knowledge is generated by several fliers who are currently studying pirelli characteristics.

The May '68 INAV gave a preliminary report about using torque to control altitude in low ceiling sites. The plot below shows the importance of winding the motor in the same fashion for both flying and "calibration" of the rubber motor. The assumption behind the test is that .22 inch ounces of torque is the required launch torque. #1 curve was wound just past .22, then backed off to exactly .22 for a short pause. The curve was then run (13 1/8" motor and 12 1/2" hook spacing). 1 1/2 hours later, curve #2 was taken under similar conditions, except that near maximum turns were put in. Two advantages of the second approach are: near maximum winds gives both higher average torque and a longer cruise, and the max turns wind is easier to duplicate and gives you more practice.

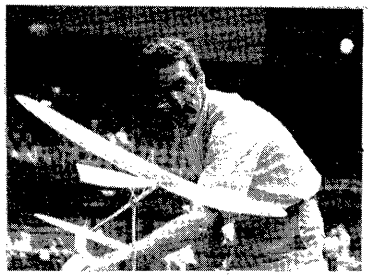











THE PICTURE STORY

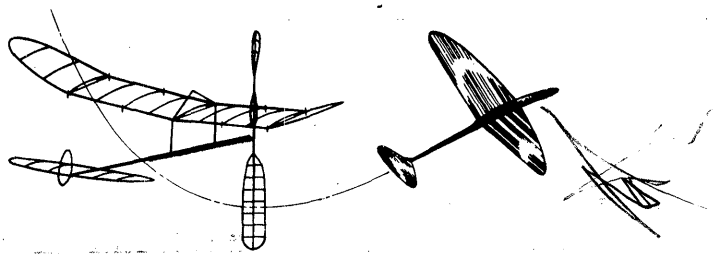
Left Row - Top to bottom: Susan and Joe Weisenbach; Phil Klintworth (l.) and Ed Stoll prepare to fly; Manny Andrade and his fourth place cabin model; (l. to r.) Wally Mumper, Charlie Sotich and Jim Richmond declare "Jetex is the only way to go!"

Middle Row - Top to bottom: Bob Gibbs holds for son Bill; Dick Ganslen and cigar; Al Rabe holds for Bud Tenny; Kristi Tenny launches D Stick.

Right Row: - Top to bottom: Linda Randolph and Bob; Stan Chilton checks torque prior to hooking up; Tony Schott; Hardy Brodersen and Paper Stick; Paul and Rosie Tryon prepare to fly an Easy B (youngest contestant?)

The Voice of N.I.M.A.S. SEP 1968

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

JOE BOYLE, JR. 219 Shanandoah Rd., Hampton, Va. 23361
PAUL DESMET, 1405 Devonshire, Grosse Pointe Park, Mich. 48230
WALTER D. KASKER, 675 Riveley Ave., Genolden, Pa. 19036

AMA Election

It will soon be time for AMA elections again - perhaps before the October issue of INAV comes out. This year we elect a new president and about half the district VP's. It is always important for AMA members to vote in these elections; the average vote nationwide is only 14%. It is easy to see how important one vote is: an average district vote will run no more than 300 votes and the victory margin of many candidates is no more that two or three votes! Contact your district VP if you want advance information on who is running in your district. Decide who will best represent you, and encourage all your friends to vote.

NIMAS Awards

In the 2½ years since NIMAS Awards were first set up, 42 fliers have received 92 awards. Eight of these fliers have received all three awards in a single category to become NIMAS Aces. 14 months ago the Junior Awards were set up and 4 Juniors have received 16 Awards, with two of them achieving Ace (see below). It is very pleasing to review the above, and to consider future activity!

Silver Cat. II Rubber Award - 21:25, Hal Crane

Silver Cat. II HLG Award - 0:50.0, Bob Dunham

Gold Cat. I Rubber Award - 12:54, Dick Ganslen

Junior NIMAS Awards

Silver Cat. II HLG Award - 0:37.2, Bill Gibbs

Gold Cat. II HLG Award - 0:43.8, Bill Gibbs

Diamond Cat. II HLG Award - 1:03.2, Bill Gibbs

Silver Cat. II Rubber Award - 15:23, Bobby Dunham

Gold Cat. II HLG Award - 0:44.4, Bobby Dunham

Diamond Cat. II HLG Award - 0:56.0, Bobby Dunham

Junior Ace

The two HLG flights above complete Bobby Dunham's Ace qualification, which makes him the second Junior to reach this status. Meanwhile, Bill Gibbs' flights listed above elevate him to Cat. II HLG Ace status also; he previously qualified as Cat. I HLG Ace and thus becomes the first NIMAS member of any age to become a double Ace!

NIMAS Charts

I will not repeat the rash promise aired in the July '68 INAV and say that all the NIMAS Charts presently on order will be delivered by a certain time. I hope to get them out soon; time has been at a premium since before the Nats and seems to remain so.

Bilgri Reprints

By special arrangement with MAN, the three articles on indoor building by Joe Bilgri which appeared in 1960 have been made available at cost. Send 60¢ to cover postage and cost to Harry Keshishian, 7 Sagamore Rd., Arlington, Mass. 02174 or Bud Tenny, Box 545, Richardson, Tex. 75080

Prop Design Graphs?

I have currently designed pitch distribution graphs of three props suitable for FAI models and one for B Paper. These graphs correspond to Fig. 2, p. 4 of the May '68 INAV, and will be made available if sufficient interest is shown. Prints will be Xerox of a tracing, suitable for direct transfer to balsa for construction of prop jigs of the type shown in Feb. '68 INAV.

FAI INDOOR REPORT

Know Your Team

Just over a year ago the U. S. Indoor Team Selection Finals were held in the Pompeian Court of Northwood Institute in West Baden, Indiana (report in Aug. '67 INAV and more pictures in Dec. '67 INAV). The top three winners in that event will represent the U. S. in the 1968 Indoor World Championship, which is to be held in Rome on Oct. 3-6 1968. Those team members are:

Clarence Mather: Clarence is 47, and is a Physics teacher in high school and junior college. His model interests include all types of FF models, with special emphasis on wakefield, indoor rubber and indoor scale. He lives in San Diego and is a member of the San Diego Orbiteers.

Jim Richmond: Jim is 40 and is manager of the Tinning Division of Sunbeam Corporation. He has built all types of models, including CL stunt and speed. His career in indoor began six years ago and has developed to the point where he holds 4 U.S. indoor records and the Cat. III Indoor World Record.

Al Rohrbaugh: Al is 47 and a mechanical engineer. His model interests have ranged through indoor, FF and RC. He returned to indoor 3 years ago after a long layoff, with a quite consistent contest record which includes two Cabin records and winning the Stout Trophy at the '66 Nats.

Bud Romak: Bud is 39 and self employed. He has 25 years of experience in FF models, including 6 years in indoor. He is the Team Manager, and his experience for this job includes being a member of the 1966 Indoor Team.

U.S. indoor fliers are rightfully optimistic toward the outcome of the 1968 World Champs, with a superb team to represent us. We all wish them the best of luck!

World Championship Entrants

I have received very little information about European teams who might have entered the World Championship. The Hungarian team will be Gy. Buzady, Antol Egri and Andras Ree. Geza Varszegi qualified high through the entire program, only to develop an abcess on his leg and will not be able to go. Ferenc Somogyi will be team manager.

The only other fliers known to be planning to go are Manfred Koller of Austria and Hans Beck of Germany. The Czech's picked a team, but no names are known. Jiri Kalina is the top flier, but several others may have made the other team slots.

Time Is Short!

In three and one half months we should be starting a team selection program for the 1970 Indoor World Championship. At present, we have no chairman, committee or approved program. It is entirely in order for all concerned fliers to offer comments on the program which selected our present team, suggestions for change, etc. We also need volunteers for Chairman (the only person in the program who is restricted from competition), planning committee members, and CD's for qualification trials. Strictly for lack of someone else to coordinate preliminary planning, I will receive your offerings on this subject. I am not a candidate for any position in this program except contestant! Send comments, suggestions and names to Box 545, Richardson, Texas 75080, but please send same by Sept. 25, 1968. Later may be too late - time slipped up on all of us!

CONTEST CALENDAR

GEORGIA - Atlanta. The Decatur Flying 8-Balls MAC plan an indoor contest early this fall; possibly as early as October. Contact John Krickel, Box 15223, Emory Univ. Branch, Atlanta, Ga. 30333 for details.

NEW JERSEY - Lakehurst. Record Trials Sept. 16, 1968. Contact C. V. Russo, 143 Willow Way, Clark, N.J. 07066

NEW YORK - Long Island. LIAMAC 1st Annual Indoor Model Meet at Cantigue Park Skating Rink, Hicksville, L. I. on October 20, 1968. Indoor Stick, Paper Stick, HLG, Indoor Scale (AMA Rules) and Easy B (paper covered only for Juniors only). CD Bill Dunwoody, 985 Fort Salonga Rd., Northport, L. I., N. Y. Site is 190' dia. dome with 50' ceiling in center.

OKLAHOMA - Tulsa. The Tulsa Glue Dobbers plan an indoor meet sometime this fall. Contact Bob Hanford, 3838 South 88th E. Ave, Tulsa, Okla. 74145.

TEXAS - Dallas/Ft. Worth/Denton. Cat. I RT at Denton in Ballroom of Texas Woman's Univ. Sept. 29, 1968, 1 pm until dark. Rubber events only. Site can be opened earlier and possibly on 9/28/68 by special arrangement with Dick Ganslen (CD), 1204 Windsor, Denton, or Bud Tenny, Box 545, Richardson, Tex. 75080

VIRGINIA - Hampton. Cat. I RT at Willis School, either Sept. 20-21-22 or Sept. 27-28-29, 1968. Contact Hal Crane, 4002 Buchanan Dr., Hampton, Va. 23369 for date.

RECORDS? MAYBE!

LAKEHURST RECORD TRIALS - Aug. 18-19, 1968 Cat. III
Hangar #6, Lakehurst NAS
Jr. Paper Stick - 21:07, Linda Randolph
Jr. AMA Cat. III FAI - 11:02, Linda Randolph

POSTAL CHALLENGERS

John Thornhill, 3334 Buchanan St., Apt. 103, Mt. Rainier, Md. 20822 wishes to challenge anyone in Manhattan Cabin or HLG. He has access to a Cat. I site.

A MICROFILM REPORT

Part II - Mixing Technique

The past several years of experience in mixing microfilm have taught me some shortcuts and techniques that may be of interest. First, accurate measurements and records are a must if you hope to duplicate that "super" formula after you use up the first batch. You must also insure that you use all of what you measure out, and you must be sure that you know what you are using.

A set of mixing utensils can be purchased at the drug store in the form of graduated medicine bottles of various sizes, and an eye dropper (be sure you get a glass dropper instead of plastic). A funnel is helpful, but be sure to get a glass one or test any plastic funnel to see that it does not dissolve in your solvents. A laboratory-type graduated cylinder is more expensive, but a 10 ml size cylinder is very helpful for measuring small amounts of solvent. The graduated bottles are available in 30 cc (1 cc = 1 ml), 60 cc, 120 cc, 250 cc and 500 cc sizes. An eyedropper can be calibrated to measure 1 cc increments, or used to meter out a specified number of drops.

Very thick liquids such as nitrocellulose syrup are very difficult to measure accurately. They should be measured with the final container if possible; that is, a larger graduated bottle which will hold all of one batch of solution. Also, care should be taken to pour without dribbling any down the inside of the measuring container. In the first case, if you measure in one container and pour into another, much of the syrup will adhere to the measure. If you rinse it out, you must use only that solvent intended for the mixture. In the second case, if you dribble it down the side, the measurement is inaccurate.

If you begin with nitrocellulose as a base, you should measure both the weight of nitrocellulose (a postage scale is adequate) and the amount of solvent it takes to put it into solution. Thus, you can duplicate the syrup mixture when you use up the first batch. It is also advisable to use the least amount of solvent you can and still make a "pourable" mixture.

When you mix a new formula for the first time, it is a good idea mix a fairly large quantity. The first benefit gained is that ingredients which are a small fraction of the total will still be large enough to measure easily. Second, if the mixture is not correct, you can divide it into smaller portions. Modify a small portion until you get the desired result; if you goof up you need only pour out the small sample instead of the whole batch

STATE OF THE ART

At the Detroit FAI Semi last June, Bob Randolph flew the model of the month to a new B Stick record of 22:47. The model is quite similar to his Top Cat IV, which was featured in an article in the June '68 INAV, and has been built in several versions. The record ship had a few minor differences from the drawing, notably a "reverse" airfoil, no compression rib at the center and no rib in the rudder. The whole model is exceptionally light, and has flown on rubber as thin as .033". Unusual characteristics of the model are a very small rudder, set straight ahead (another change from drawing), with turn derived from the wing offset and stab tilt. Bob says that models with this adjustment apparently fare better in drift - a point that is well worth checking out. The "reverse" airfoil is an experimental feature which Bob says seems to slow the climb during the burst - very beneficial under low ceilings.

THE LAB

Joe Hindes uses this test to sort fresh rubber, with the warning that it is a highly subjective sort of test. That is, it requires both judgement in application and experience in interpretation to achieve repeatable results.

The basic method is to hang a paper clamp on a length of rubber exactly 10" from the point of support (another clamp). He then adds a fixed amount of weight (which just happens to be 385 grams total weight with the clamp) and measures the length as soon as the rubber stops its rapid stretch. The rubber will continue to stretch slowly, so he takes another reading after 60 seconds.

In practice, the supporting clamp is mounted on a vertical scale or ruler. A segment of rubber is fastened in the clamp and the second clamp is fastened on at the 10" mark. The extra weight is then added and two readings taken. The 385 gram weight (an arbitrary choice) is reduced by half for 1/8" rubber so comparison can be made between 1/8" and 1/4" flat rubber.

The meaning of the readings is as follows: 1/4" flat pirelli will stretch about 14" initially. Very fresh or poor rubber will stretch an additional 1/2" in 60 seconds, and cured (aged) rubber of good quality will only stretch 1/8" more in 60 seconds. Comparisons between other sizes of rubber can be made by scaling the weight in proportion to the width of the strip.

FINER POINTS OF IHLG

by Nat Antonioli

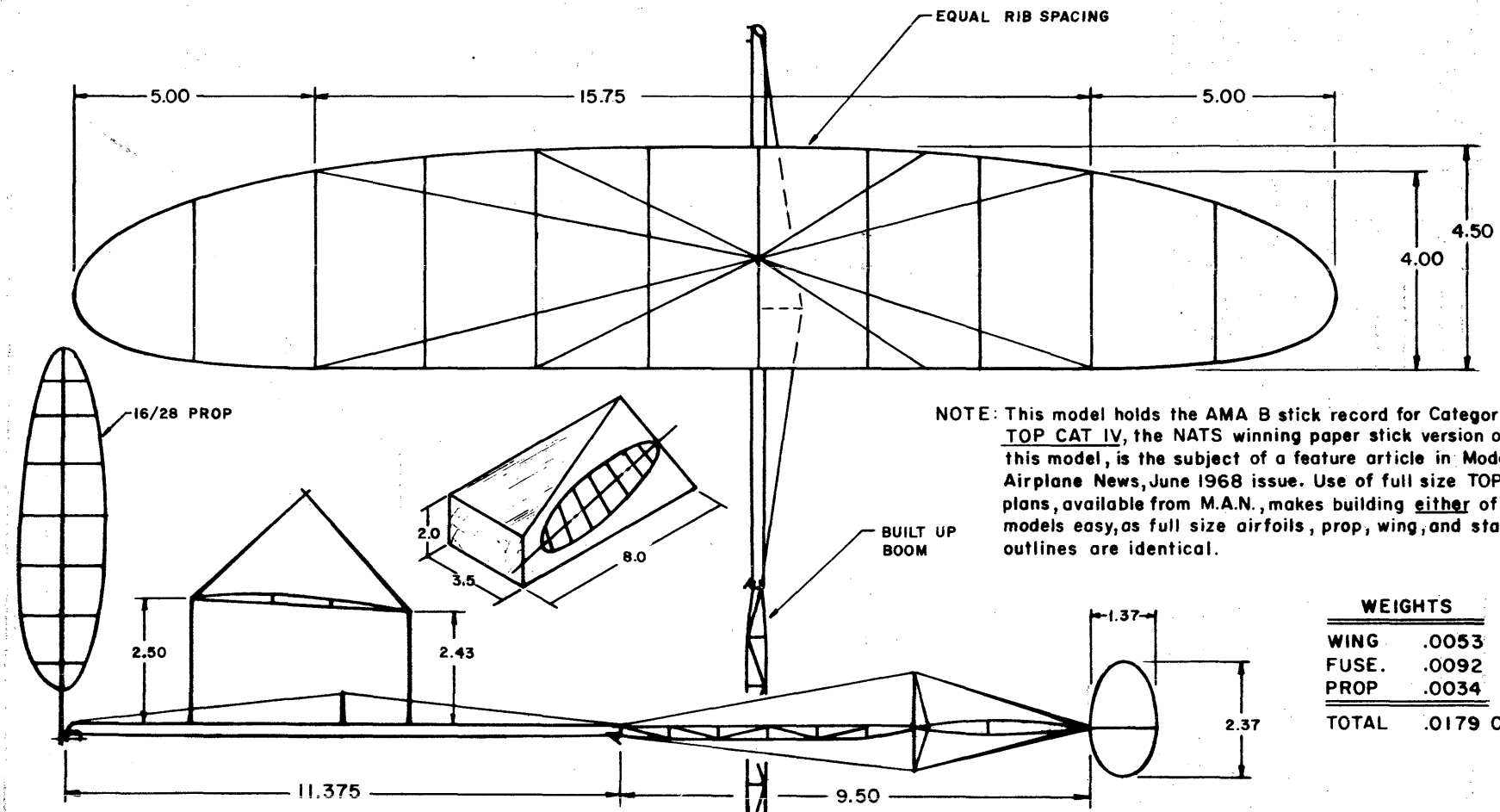
I think it's best to divide the subject into 3 categories: Construction, Adjustment and Design Philospohy.

Construction

First, the model must be light in weight, for obvious reasons. This must be accomplished by careful choice of material. Use fairly stiff "quarter grain" wood (4# to 6# wood) for wings and tail surfaces. Such wood prevents wing and tail flutter (these are usually very thin) during launch and retards formation of warps later. Fuselage wood should be stringy "B" grain wood between 6# and 8# in weight to prevent fuselage flutter and whip on launch. It is common to see low ceiling gliders which can be thrown to the top of a site and won't pull out; but recovers perfectly when thrown to a lower altitude. Fuselage and/or tail flutter is almost always the reason. Assembly of gliders should be with "white" glue or Tite-Bond. Regular model glues of the cellulose acetate type (Ambroid) tend to shrink too much, causing potential warps. These glues are only good for emergency repairs during flying.

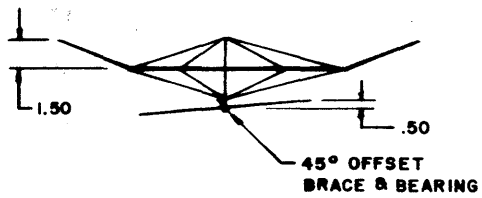
Adjustment

The design should include an assymetrical wing (longer on inside of turn) and the launch and glide should be in the same direction. Such a configuration and launch keeps the inside wing up in launch and glide. This is quite important where the site has limited floor space - it makes a consistent launch recovery and glide pattern much easier in narrow sites. A small amount of stab tilt helps to hold a consistent glide circle. It is usually best to use a minimum of rudder tab for turn; a rudder adjustment that is right for glide is usually too much for the launch. One more comment about the offset wing: this eliminates need for clay on the "inside" wing and cuts down on the total weight of the glider. The drag of clay on the wing tip will cut down duration, as will clay blobs for nose weight. Make a preliminary adjustment of the glider with clay, then inset a piece of lead into the nose. Make the lead slightly lighter than necessary and make final trim with a smear of clay. Such reduction of drag can increase low ceiling times up to one second.

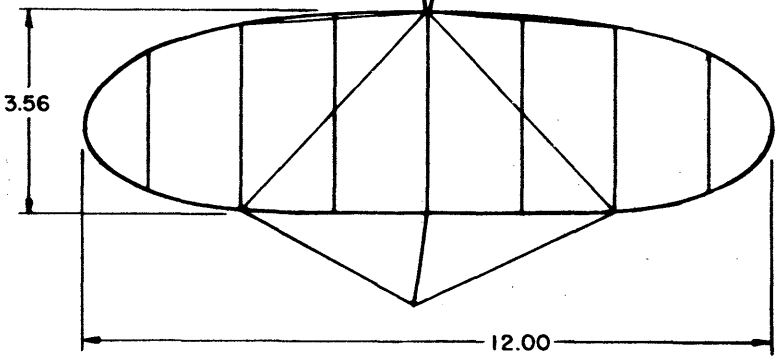


NOTE: This model holds the AMA B stick record for Category 2. TOP CAT IV, the NATS winning paper stick version of this model, is the subject of a feature article in Model Airplane News, June 1968 issue. Use of full size TOP CAT IV plans, available from M.A.N., makes building either of these models easy, as full size airfoils, prop, wing, and stab outlines are identical.

WEIGHTS	
WING	.0053
FUSE.	.0092
PROP	.0034
TOTAL	.0179 OZ.



FRONT VIEW



TOP CAT III FAI

DESIGNED BY : BOB RANDOLPH

0 1 2 3 4 5
SCALE - INCHES

TFY

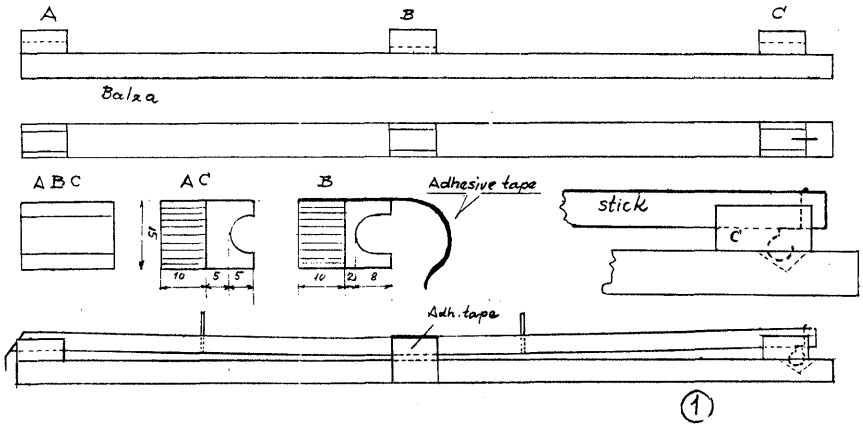
Design Philosophy

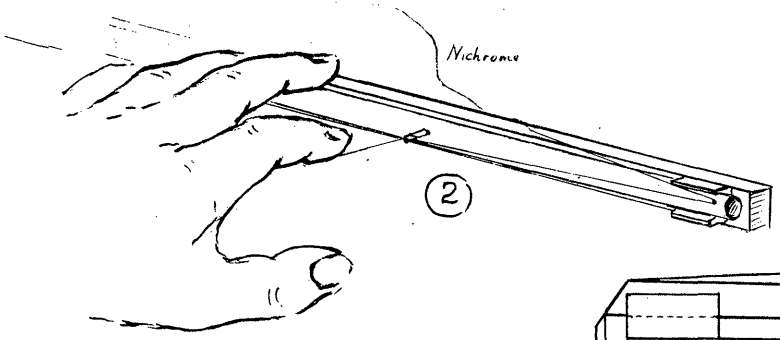
Keep the model and design simple and light, and use conservative planform design and proportions. Refine the basic design as you learn; do not hesitate to try changing the design a little at a time, but be sure that you test each change thoroughly. Seek advice from an acknowledged expert. Once a novice overcomes the hurdle of getting consistent flights, he should refine the adjustment technique and try more of his own ideas as he goes along.

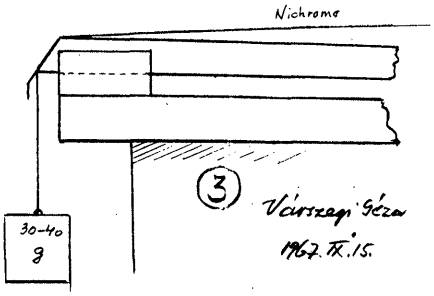
FUSELAGE BRACING JIG

The jig detailed below was designed and submitted by Geza Varszegi (member of Hungarian Indoor Team in 1962 and 1966, and leading contender for 1968 Team). The jig is arranged so the fuselage can be reverse bowed or pre-loaded to any practical degree, or braced straight. By using a weight as shown in sketch 3, any degree of tension may be used in the brace wire. A similar approach should be used with two-wire bracing, except that a small guide can be made to help align each pair of posts. Also, great care must be taken to insure equal tension in each wire, and both wires should be installed simultaneously.

TÖRZSMEREVITŐ ESZKÖZ







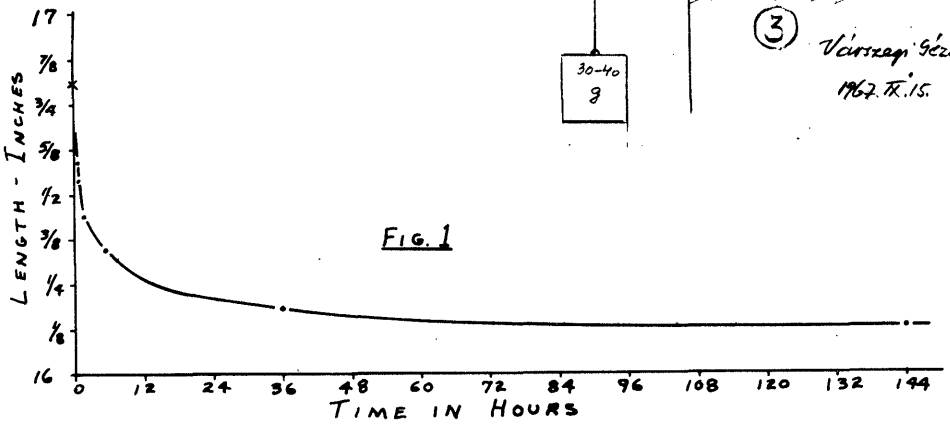


FIG. 1

PIRELLI LORE

The three curves below indicate pirelli's response to break-in. The data was all taken by winding, but it is quite reasonable to assume that the final conclusions will apply to rubber broken-in by stretch methods, providing the break-in is complete.

Fig. 1 is the result of a "rest test" by Jim Richmond. it shows that a motor takes about one week to come to a stable length after being wound, and that the process is nearly complete after 24 hours. The test was made after the 6th wind on a motor which was 15" long new. Fig. 2 shows the increase in length of a motor with successive windings. Bob Platt wound the motor 7 times, taking about 15 minutes to unwind, and letting the motor rest for 30 minutes between winds. Under these conditions the motor stretched a total of over 15%. Fig. 3 shows a similar run with a 15" motor, rested for 24 hours between winds. Here the maximum stretch was about 13%; both motors can be expected to recover to just over 10% permanent elongation as demonstrated by Fig. 1.

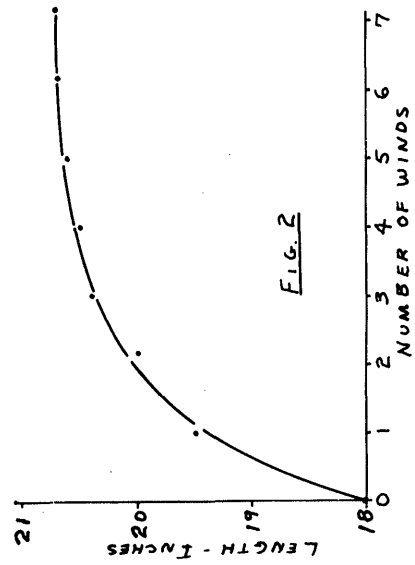


FIG. 2

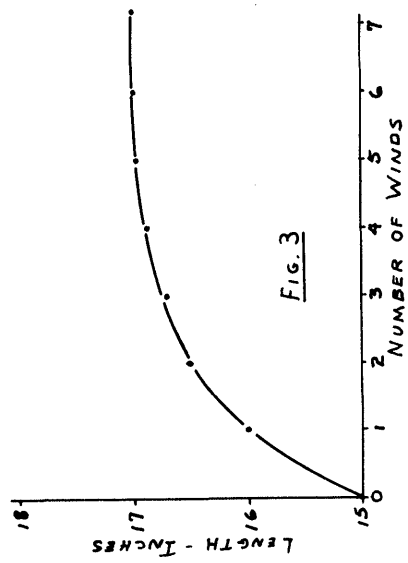
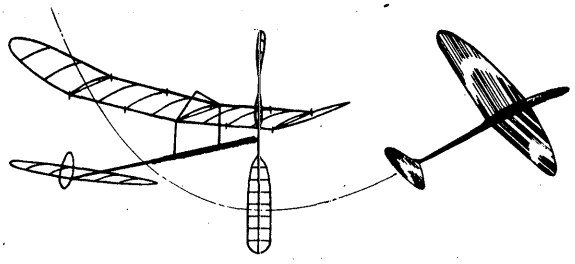


FIG. 3

The Voice of N.I.M.A.S. OCT 1968

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

INDOOR WORLD CHAMPS RESULTS

	NAME	COUNTRY	I	II	III	IV	V	VI	TOTAL
1.	Jim Richmond	U. S. A.	32:11	28:37	-	26:30	33:40	36:18	69:58
2.	Jiri Kalina	Czechoslovakia	28:09	34:44	33:22	34:46	33:28	04:20	69:30
3.	Eduard Chlubny	Czechoslovakia	09:38	31:46	33:51	30:32	22:10	33:28	67:19
4.	Hans Beck	Germany	03:21	32:42	-	29:58	28:32	33:22	66:14
5.	Manfred Koller	Austria	30:06	30:13	23:54	33:06	12:10	13:19	63:19
6.	Clarence Mather	U. S. A.	32:38	27:30	29:04	29:14	00:11	00:11	61:52
7.	Egizio Corazza	Italy	32:01	26:30	29:02	26:38	23:33	24:39	61:03
8.	Vilim Kmoch	Yugoslavia	06:16	30:00	23:10	30:01	28:58	07:13	60:01
9.	Jiri Sitar	Czechoslovakia	26:21	11:39	-	00:10	25:04	32:43	59:04
10.	Walter Hach	Austria	27:58	28:59	-	26:42	25:17	29:43	58:42
11.	Andras Ree	Hungary	27:35	25:38	28:17	29:11	09:49	23:42	57:28
12.	Antal Egri	Hungary	11:43	26:40	28:18	28:47	28:34	27:20	57:21
13.	Carlo Cotugno	Italy	14:11	08:13	00:04	26:38	15:35	27:54	57:21*
14.	Kurt Vogler	Germany	26:41	28:37	-	09:14	22:43	28:40	57:17
15.	Al Rohrbaugh	U. S. A.	08:54	27:19	21:45	29:53	24:02	24:52	57:12
16.	Harro Erofejeff	Finland	21:29	25:24	17:59	26:32	26:42	28:18	55:00
17.	Teodor Strasberger	Yugoslavia	26:36	21:37	22:42	26:05	25:10	26:53	53:29
18.	Werner Wetzel	Germany	26:15	09:08	19:35	27:12	24:33	16:07	53:27
19.	Esko Tirronen	Finland	26:48	00:52	-	04:54	21:50	26:36	53:24
20.	Leopold Gabriel	Yugoslavia	17:59	00:12	20:36	24:46	22:49	24:31	49:17
21.	Olof Nordlund	Finland	00:12	00:28	18:46	23:31	22:43	10:39	46:14
22.	Gyorgy Buzady	Hungary	20:01	01:36	19:23	17:16	17:25	15:50	39:24
23.	Germano Masciullo	Italy	12:53	06:11	17:49	18:14	12:20	17:32	36:03
24.	Guy Cognet	France	07:10	08:58	12:44	12:18	12:48	11:07	25:06

TEAM PLACINGS

1.	Czechoslovakia	195:53	6.	Hungary	154:13
2.	U. S. A.	189:02	7.	Italy	151:38
3.	Germany	176:58			
4.	Yugoslavia	162:47	8.	Austria (2 men)	122:01
5.	Finland	154:38	9.	France (1 man)	25:06

*The Individual Official Results sheet listed Cotugna with 57:21 total as shown, but his best two flights total 54:32. The team total shown above is correct, so this correction would place Cotugna in 16th place and move Vogler, Rohrbaugh and Erofejeff to 13th, 14th and 15th places respectively.

1968 World Indoor Championship

by Clarence Mather

"Terrific!" is the best way to describe the '68 World Indoor Championship. That includes the planning and execution of the contest by the Italians, the flying site, the standard of flying, and the comradeship of the modelers. The twenty-four contestants representing nine countries made this the biggest Indoor Champs yet!

I would like to describe some aspects of the entire trip although a detailed report would fill many pages. So, I'll try to be concise. It began with an overnight flight from San Diego to rendezvous with the rest of the team at Philadelphia. Then a day of processing at McGuire AFB, New Jersey and another overnight flight to Frankfort, Germany. Apparently AMA HQ did their job well because we had no problems.

The models survived the trip with only minimal damage, due to sturdy boxes, well-packed parts and generally careful handling by air line and Air Force handlers. They all were very cooperative to our needs. Al Rohrbaugh's king-size box containing ten (10) models received especially tender care when it was rumored among the baggage people that it contained a special radar set!

The modelers were in considerably worse condition than the models since we had gone two nights with just a couple of hours sleep each. Due to time differences, travel, model flying and various other activities we spent little time in bed.

After some hours of recuperation at Frankfort we crammed the mountain of baggage and boxes into a VW Microbus and set out on the Autobahn - the original freeway. We then discovered that Romak is a natural Grand Prix driver! In Europe many drivers use just two speeds - zero and full throttle! If something is in the way, honk the horn and use any lane (or half a lane) to get around. Brakes are used only as a last resort and seem to be regarded as a signof impotence. Tail-gating and cutting in and out sharply are the usual techniques. It is a tribute to the exacting skills of the European drivers that we saw only four or five accidents during our travels. Anyhow, Romak took to this high speed bedlam like a duck takes to water and so we crossed Germany, Switzerland and Italy. Border guards paid scant attention to our luggage until we got to the Italian line. There a couple of militant young guards took one look at the stuffed Microbus and decided that we were trying to bootleg pizza or spaghetti into the country. They directed us to some other authority, but since they could speak no English and we no Italian we could not figure out where or who. After blundering about for a time we finally got to the big wheel. After opening one model box he gave us admission and we continued on our way.

When the team first joined up we discussed mostly modeling but soon talk turned to other things. With Al as sparkplug the conversation took on what I would call a "stag party" tone. It stayed in that vein for most of the trip and Al's seemingly endless supply of stories, poems, and salty observations kept us in a jocular mood.

In Florence we stopped at the home of Egizio Corazza and were greeted warmly and hospitably by Egizio and his gracious wife. Egizio's models showed a very high degree of construction skill that we were to find the rule rather than the exception among European models.

We arrived in Rome on Monday night and got our first look at the Sports Palace. It is a beautiful building! The Sports Palace is at the extreme south edge of Rome and was built for the 1960 Olympics. It is a circular building with two tiers of seats surrounding a floor diameter

of 164 feet (yep, 50 meters). A domed roof arches up from the highest row of seats to a peak of about 115 feet. The roof consists of fluted concrete beams and glass. It does not catch models but there is a speaker/lights complex at top dead center that did catch a few high climbers. The Palace is drafty by day but is an excellent site at night.

We tested our models for many hours over the next few days and found it difficult to get altitude. If we did get good altitude, drift carried the models into the seats. Getting to a rapidly drifting model in time to avoid a damaging seat landing was difficult. Sections of the seats were isolated from each other by tall glass panels, thus requiring a trip through corridors and up or down stairs.

Contestants from other countries kept arriving and we had an opportunity to meet persons we knew only as names from these pages. Usually at least one member of a team could speak English, so we had many cordial conversations. Inspecting the models and watching them in action gave plenty of evidence that the competition was tough! The models were well built, light, and cruised at low RPM. They all stuck to shortish motor sticks and booms rather than the long ones used by the American team. The Czech models in particular looked much like Bilgri designs. Many others had narrower chord wings of perhaps 100 to 120 square inches. Vilim Kmoch used a completely flat stabilizer on a model that flew very well.

On Thursday we had our first chance at evening flying. The powerful lights warmed up the air somewhat and it was definitely more buoyant and fairly stable - much less drift than in the daytime. Our models came to life in this air and Richmond and Rohrbaugh had test flights exceeding thirty-one minutes.

Finally, Friday evening arrived and so did the opening ceremonies. Dignitaries present included a general from the Italian Air Force. Each team marched out to the center of the floor to the strains of its national anthem - a proud moment for us all. Then came the flying. First to test the air was a member of the host country. The air seemed good and soon there was a waiting line to fly. Officials wisely held to a maximum of four models in the air at one time to reduce the chances of collision. One of the pre-contest favorites, Kalina of Czechoslovakia, was up high for a good flight but then drifted over into the seats for 28:09. Mather was the first American up. The model stayed right over the floor, climbed to perhaps 95 feet and did a nice 32:38. Richmond did not climb as high yet did 32:11. Rohrbaugh climbed beautifully but hung on the center post at 8:54. Corazza of Italy did 32:01 and Koller of Austria did 30:06. Those were the longest flights of Round One. Since I was leading, I immediately suggested that we end the contest right then! The suggestion received little support from the others.

In Round Two the air was cooler and less buoyant. Richmond did 28:37, Mather 27:30 and Rohrbaugh 27:19. None got high. Kalina "leaned on" his winder and his model was soon up bouncing around the center post. It did not hang and he got a great 34:44. Hans Beck, 1966 World Champ of Germany did 32:42, Chlubny of Czechoslovakia 31:46, Koller 30:13 and Vilim Kmoch of Yugoslavia 30:00, for high flights of that round.

It had been difficult to see the models against the glare of the bright lights, so on Saturday only part of the lights were turned on. That made it easier to see the models but the air stayed cooler. Kalina's model climbed rapidly, struck the top, tail slid down buckling the tail boom, but then it popped straight again and the model went on to do a great 34:46! Chlubny did 33:51, Koller 33:06, Kmoch 30:01, Beck 29:58, Rohrbaugh 29:53 and Mather 29:14 for high times on Saturday.

At the end of Round Four the U.S. Team was leading with 179:52. Czechoslovakia had 173:07 and West Germany 171:25. The lead was nice but Sitar of Czechoslovakia had a low flight in that total and we knew he could do much better.

Richmond had been flying his very light model which had great potential but had not reached high altitude. So on Sunday he tried a larger motor which collapsed the stick and ruined the model. The Jim assembled an older, stronger model and put up a 33:40 flight which still did not reach the top. The last round came up with him needing almost thirty-six minutes to pass Kalina for individual honors. Jim wound the model as never before and it responded perfectly! The model climbed right up next to the roof, touched a short rope that dangled from the center, then descended slowly for a magnificent 36:18! That was the longest flight of the meet by over one and a half minutes and gave Jim a deserved World Champion honor.

Meanwhile Sitar turned in 25:04 and finally a 32:43 to give Czechoslovakia the team lead. Rohrbaugh could not get his model high enough for it to realize its great potential. Mather wound to breaking on the last flights and something twisted to give a power stall. And so the flying ended, thrilling or frustrating, but always exciting.

We were sad to see the contest end and have to start the long journey home, but there are many pleasant memories that make it all worthwhile. The associations with the members of our team and all the other fliers were great. It was a pleasure to fly in such a well organized and well conducted contest. The tours of the historical sites and beauties of Rome and Tivioli that were arranged by the contest committee were outstanding experiences. The banquet of sumptious Italian food and the awarding of prizes were fitting climaxes to the whole affair.

We who were lucky enough to participate would like to offer thanks to a number of people: to the Italians for conducting such an excellent contest, to modelers like Joe Bilgri for keeping Indoor alive, to Bud Tenny for this newsletter that has done so much to keep Indoor growing in popularity, and to Bud Romak for doing a fine job as Team Manager and who supplied us with snazzy turtle neck sweaters properly lettered.

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

RICHARD ENNIS, 2401 Taxco Rd.#105, Ft. Worth, Tex. 76116
JIM GREMEL, 8618 Jo Court, Berkeley, Mo. 63134
RICHARD POWELL, 804 Windsor, Denton, Tex. 76201

Family Memberships

JEAN ELEECE ENNIS, 2401 Taxco Rd. #105, Ft. Worth, Tex. 76116

Honorary Members

P. H. LAGAN, 28 Avro Cres, Christchurch 4, New Zealand

Ernie Kopecky Ill

Ernie Kopecky is seriously ill, recovering from open heart surgery. He is in Columbus Presbyterian Hospital in New York, but get well cards and encouraging notes should be sent to his home: 38 Fawn Lane, Watchung, N. J. 07060.

Change of Address

Bob and Linda Randolph and family have moved to 25145 Lawton Ave., Loma Linda, Cal. 92354 and requested that their friends note this new address. A reminder: any NIMAS member who moves may request a similar announcement.

NIMAS Awards

Gold Cat. I Rubber Award - 13:35.4, Bob Champine

Diamond Cat. I Rubber Award - 16:23, Bob Champine

Diamond Cat. I Rubber Award - 15:44, Jim Clem

Rubber Evaluation Opportunity

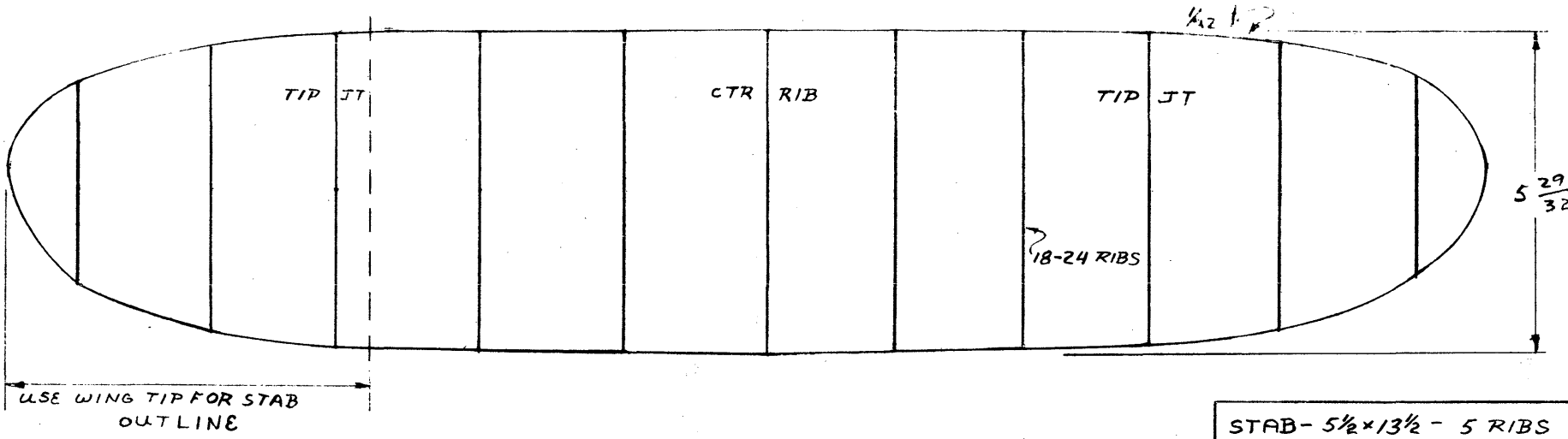
Frank Zaic has started to produce some special beginner kits of HLG, Catapult Glider and rubber powered model types. The catapult and rubber models use large quantities of 1/8" Pirelli. He is therefore making an offer to indoor fliers: "I will be using 1/8" Pirelli as a standard part in the Jasco kits, and will be getting several shipments a year. I will be glad to send 24" sample lengths from every new shipment to any indoor builder who will take the trouble to send me a self-addressed and stamped envelope and ask no questions. In return, pass the word if the lot is good or bad so there will never be a shortage of top flight rubber."

NFFS Announcements

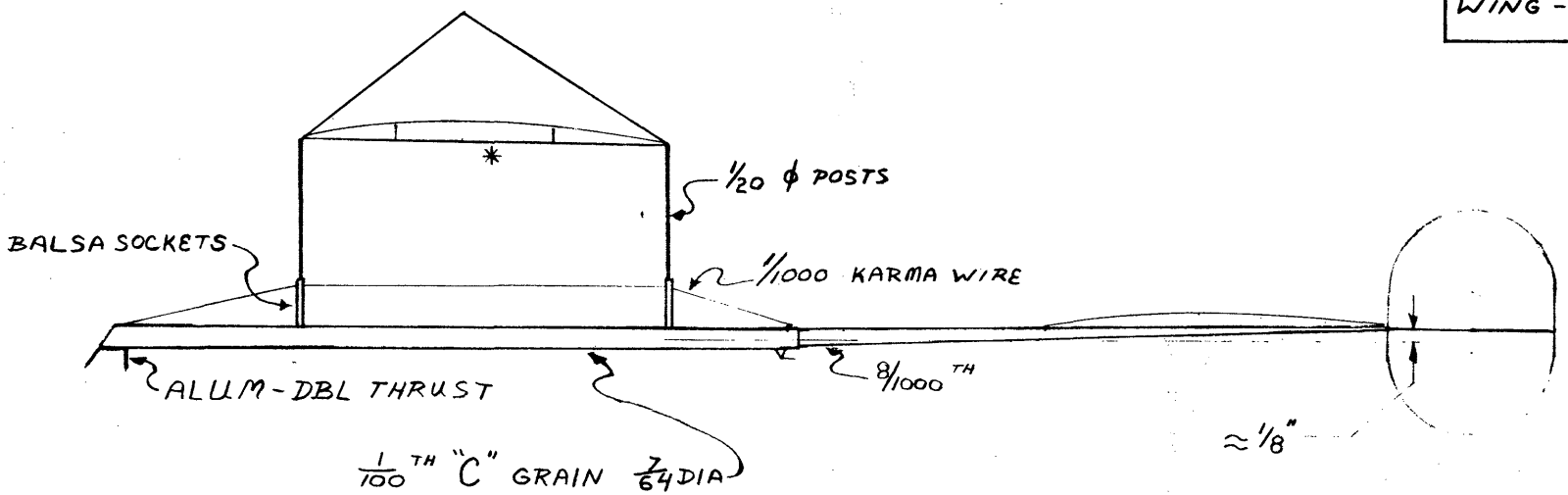
NFFS Public Relations Director Dave Linstrum has asked that the following announcements be made:

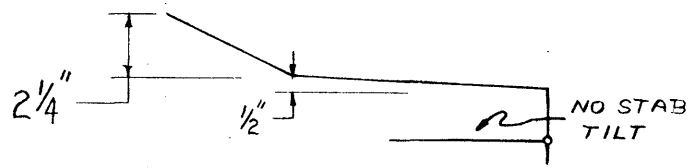
1. The 1969 FAI FF W/Ch may be held on East Coast USA. All free flighters should keep alert for notices about status. Timers, scorekeepers, and proxy fliers will all be needed. This is a rare opportunity to see a W/Ch first hand. Plan to attend, help make it a great W/Ch. Look for word from AMA and NFFS in late Fall - actual approval of USA as host would be at November CIAM meeting.

2. 1971 FAI FF Team Selection planning has begun and qualification trials will be held in Spring of 1969, Semi-Finals in Summer of 1969 and Finals in Summer of 1970. Exact dates and details should be available in early 1969. Best way to receive info is to get on the list - if you flew in 1969 program you are on list, otherwise write Dave

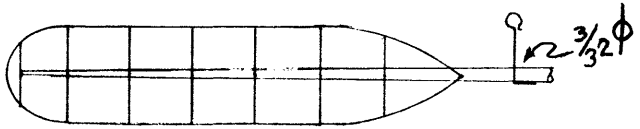


STAB - 5½ × 13½ - 5 RIBS
WING - 5⅞ × 26 9/16 FLAT





STANDARD WING BRACING
NO BRACING ON STAB
ALL BRACING WIRES 1/1000 NICHROME
EXCEPT MOTOR STICK



ALA-BILGRI PROP 16 DIA x 38 PITCH

GOLD MICROFILM — SEMI-LOOSE
MODEL WT. - .026
RUB. WT - .033 (≈14½" LP)

COPPA URBE
WINNER - OCT, 1967
by VIRI KALINA
CZECHOSLOVAKIA

SCALE: 1" = 3" | DRN: CL 7/11/8

Linstrum (program administrator), 12411 Leigh Lane, Maryland Hts., Mo. 63042.

3. NFFS will hold the 2nd Annual NFFS Free Flight Symposium at Willow Grove Nats. Those interested in submitting papers should write Dick Mathis, 1222 Briar Cove, Richardson, Tex. 75080. Copies of 1968 Symposium Report are available from NFFS. 104 pages, 12 papers, illustrated, soft cover. $3.50 postpaid. Send money to Annie Gieskieng 730 Moore #2, Lakewood, Colo. 80215.

FAI INDOOR REPORT

Team Selection Program

A program essentially similar to the one which was used in 1967 has been submitted for approval. Main differences: Local Trials qualify all who make 60% of top time for that Trials. Entrants in AMA meets who fly model 65 cm span or less can qualify for Quarter Final by making 60% of winning time for the event flown in.

Meanwhile, manpower is still short. Bob Champine and Dick Ganslen will serve as program coordinators in Eastern and South Central areas respectively. A few CD's have volunteered to run meets, but we still need North Central and Western coordinators and a Program Chairman. Volunteers?

CONTEST CALENDAR

GEORGIA - Atlanta area. The Decatur Flying 8-Balls MAC 1st Annual Indoor Contest, Nov. 17, 1968. Site is the Cumming High School Gym, a reasonably clear dome about 30' usable. Easy B and HLG (Jr. & Sr.-Op.); Paper Stick and Indoor Scale (all ages combined). Warren Lawrence, Box 225, Decatur, Ga. 30031.

MARYLAND - Silver Spring. Indoor sessions, 7 pm to 11 pm, at John F. Kennedy High School Gym. Oct. 25, Nov. 8, Nov. 22, Dec. 6, Dec. 20, 1968. School address: 1901 Randolph Rd., Silver Spring, Md. Bill Saunders, 11613 Le Baron Terrace, Silver Spring, Md. ph. 301-593-7196

OKLAHOMA - Tulsa. Tulsa Glue Dobbers RT, Friday pm (Oct. 25, 1968. "Jingle Bells Jamboree", Class A Indoor Meet, Dec. 8, 1968. Trophies 1st only; expert/novice breakdown in HLG, Easy B, Indoor Stick. Events: HLG, Easy B sized paper covered, Paper Stick, Indoor Stick, Indoor Scale. Bob Hanford, 3838 South 88th E. Ave, Tulsa, Okla. 74145.

TEXAS - Dallas/Ft. Worth/Denton. Cat. I RT, Oct. 27, 1968 Stan Chilton CD, 446 Ida, Wichita Kan. 67211. Site can be opened on 10/26, 1968 by contacting Bud Tenny or Dick Ganslen.

RECORDS? MAYBE!

BRAINBUSTERS RECORD TRIALS - Sept. 28-29, 1968 Cat. I
Willis School at Hampton, Va. 20' ceiling
Open B Cabin - 7:33, Tom Vallee
Open C Cabin - 9:42.4, Hal Crane
Open Paper Stick - 13:06.0, Bob Platt
Open D Stick - 17:45.7, Hal Crane

POSTAL CONTESTS!

Tom Vallee proposed a postal meet between entrants in the Hampton, Va. Cat. I RT and the Denton. Tex. Cat. I RT, in Paper Stick, Indoor Stick and FAI. The challenge was accepted before it was known that Bob Champine, normally at Hampton, would be in Dallas. (No fudge factor was used, by agreement of both sides.) (FAI times 2 flight total)

Hampton	Paper Stick	Indoor Stick	FAI
Hal Crane	10:03	17:45.8	
Tom Vallee	10:05	13:25	28:55
Bob Platt	12:37		
Denton			
Bob Champine		15:27	31:58
Jim Clem		15:20	31:07
Bud Tenny		14:43	13:26 (1)

INDOOR SCALE AT NATS

This information was only recently received; the top places at the NFFS Indoor Scale event were:

Class I - Pre-WW I		Class II - WW I	
1. Tom Peadon	184.4	1. Jed Kusick	109.2
2. Fulton Hungerford	177.8	2. Jed Kusick*	108.7
Class III - Inter War		**Class IV - WW II & Racer**	
1. Don Garofalow	187.8	1. Russ Kuhlen	54.0
2. Ken Johnson	146.2	2. Lloyd Wood	48.0

*Kusick donated 2nd place trophy to 2nd highest Jr. point winner, Fred Schroeder.

Special Craftsmanship Award went to Fulton Hungerford for his amazing Wright Model "A".

Special award for Junior high time went to Patrick Wood, 58 points.

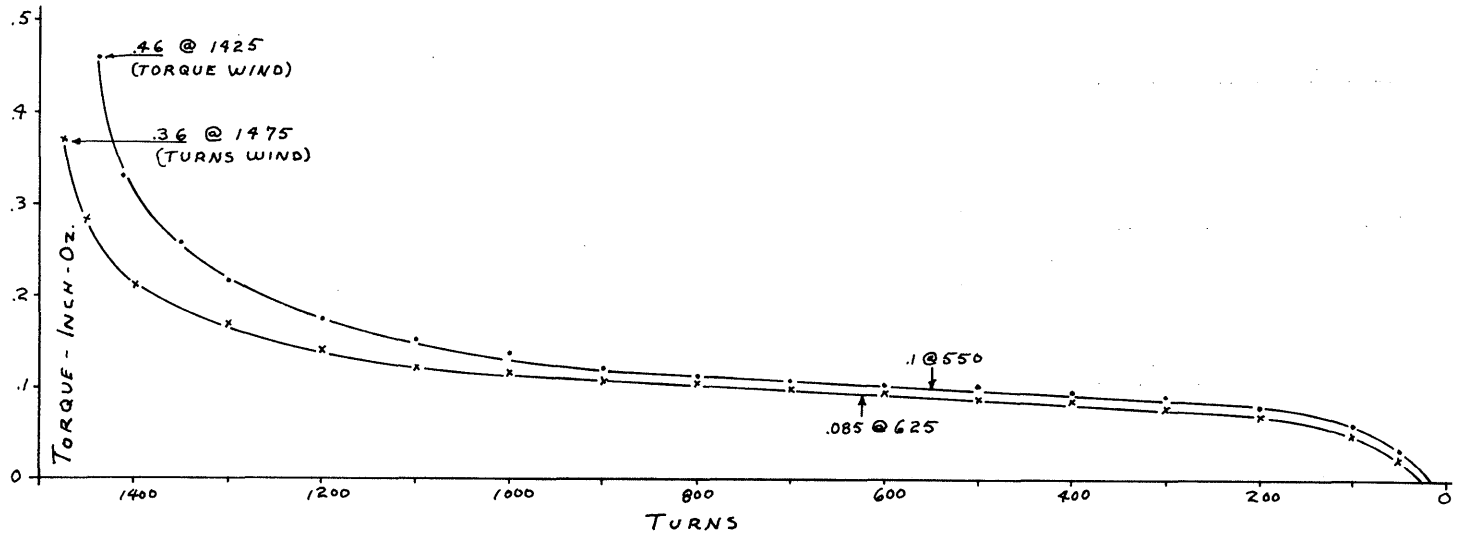
STATE OF THE ART

The model of the month is by Jiri Kalina, and the plan information was furnished by Bud Romak. Bud traded models with Jiri at Coppa Urbe in Rome. Coppa Urbe was the first international meet held in Italy, and was the "proof of the pudding" of Italian W/Ch facilities. Jiri won the contest with this model, by a good margin. The model is believed to be quite similar to the ones Jiri used to set the Cat. I World Record (twice), and to place 2nd at the 1968 Indoor World Championship. With such an enviable series of performances, it is clear that Jiri is a master craftsman and a tremendous competitor!

PIRELLI LORE

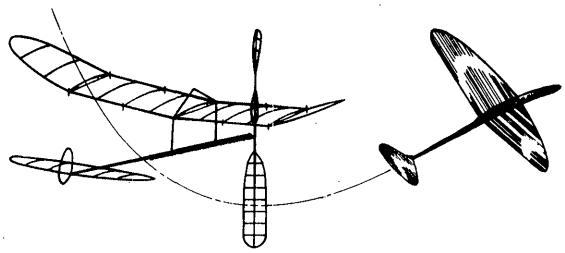
Winding technique is very important to the shape of the torque curve. The graph below shows the difference between a "torque" wind and a "turns" wind on a motor 16½" long operated on 15" hook spacing (length after break-in). The "torque" wind yielded 15% higher average torque and a shorter cruise portion.

To define the type of wind, a "torque" wind is started by beginning to wind before stretch, winding as you stretch out to 2 1/2 or 3 times normal length, and crowd the torque as you come in early (winding on a torque meter is a must to know where you are at all times). The "turns" wind is begun by stretching out to more than 3 times normal length before winding, and coming in only enough to keep the torque level from zooming to the break point. It should be obvious that practice is required for maximum turns in either case!



The Voice of N.I.M.A.S. NOV·1968

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

Brig. Gen. FRANKLIN M. DAVIS, 26 Abingdon St., Arlington, Va. 22204

Honorary Members

GUY COGNET, 43 rue Gardenat-Lapostol, 92 Suresnes, France
P. H. LAGAN, 28 Avro Cres, Christchurch 4, New Zealand
KURT VOGLER, 42 Oberhausen, Schmiedstr. 62, Germany

Sponsored Junior Memberships

Our newest sponsored Junior member is Phillip Lawrey, 221 Auburn St., Auburndale, Mass. 02166. Phil was nominated by Ray Harlan, and has the following remarks about his modeling experience:

"I have been modeling for about four years and have built numerous stunt and sport models including a twin engined model which incinerated itself the first time I tried to fly it. I have also built about 17 indoor HLG (all bombs) and a lot of rubber powered semi-indoor models (Jetco ROG type), a couple of indoor scale machines and a few other models. I have also built some towline gliders and a few 1/2A FF, but there is little space around here."

Phil has expressed an interest in building indoor rubber and ornithopter models, and flies with the Tech Model Aircrafters club at M.I.T.

Those NIMAS members who may have forgotten about the sponsored Junior program can write and ask for details. In brief, the program operates on donated funds and pays $2 toward each membership. The Junior gets a full membership and any special help possible at the rate of $1 for the first year; regular rates thereafter.

Change of Address

John T. Ganser has moved; his new address is: #7 Clinton Ave., Merchantville, N. J. 08109.

AMA Election

This newsletter is planned to arrive at your house in time to remind you that AMA ballots must be postmarked on or before November 15, 1968 in order to be counted. It would be ideal to have a large ballot return for once; the average for past elections is about 14% return from those eligible to vote. Shameful!!

Junior NIMAS Awards

Silver Cat. I Rubber Award - 9:15.6, Bobby Dunham

Gold Cat. I Rubber Award - 9:44.0, Bobby Dunham

Financial Report

As INAV moves into the eighth year of publication, it shows an increase in average circulation of 12% - about three year's growth in one. In plain numbers, the average circulation was 249 issues per month; correspondence was slightly lower at 693 incoming letters and 893 outgoing. Income was $708, with $651.80 expenses for a $57.20 surplus. This brings the NIMAS operation about even over the past seven years. The expense breakdown:

Printing INAV	$248.36
INAV Postage	191.85
Other postage	126.00
Office Supplies	85.59
	$651.80

As usual, the time it takes to prepare any issue of INAV amounts to about 65 hours per month, counting proofreading by Jody, assembling the mailing by the whole family, and time donated by others such as draftsmen and any one else who contributes material to the issues.

SPECIAL INTERNATIONAL ISSUE

This issue is dedicated to indoor fliers all around the world, in recognition of the wonderful spirit of comradeship and international cooperation so often demonstrated whenever indoor fliers gather. It is appropriate also to share my appreciation for the cards I receive from the various international meets. These cards, signed by all the fliers present, give me a warm feeling of having been among friends, in spirit if not in body.

FAI INDOOR REPORT

Program Officials Chosen

Clarence Mather has been appointed as Team Selection Chairman, with Bob Champine, Jim Richmond and Dick Ganslen serving as Area Coordinators for the Eastern, North Central and South Central areas respectively. Western Area Coordinator post is open, with either Mather or Bud Romak as likely candidates. It is not too early to begin planning for the team qualification trials, so those who are interested in flying in the program should contact the Area Coordinator nearest you so he will be able to plan Trials in your area.

Bob Champine
360 Abingdon Circle
Hampton, Va. 23369

Jim Richmond
131 Pamela Drive
Bensenville, Ill. 60106

Dick Ganslen
1204 Windsor
Denton, Tex. 76201

Clarence Mather
3880 Ecochee Ave.
San Diego, Cal. 92117

Team Selection Program

The following text has been released by AMA HQ for publication in the Club Mailing and Model Aviation:

1. Entry requirements:

a. A contestant who wishes to qualify at a regular sanctioned AMA Indoor contest must preregister via AMA HQ by remitting a qualification fee ($3 for Open members, $1 for Jrs. and Srs.), in return for which he will receive a program entry form. The contestant must then fill out the form, obtain the meet CD's signature, to certify that the information is correct, then mail the form back to Headquarters. Note: the qualification fee mailing must be postmarked no later than midnight of the day before the contest of qualification.

b. A contestant who wishes to qualify via local qualification trials will pay a qualification fee (same as in 1. a., preceding), to the Contest Director at the first trials. Upon receipt by Headquarters of the contest report from the trials CD, with fees, those contestants who did not qualify will be forwarded a program entry form, as per a.

c. Those who qualify by either a. or b. will receive a notice of qualification, certifying eligibility for the quarter-finals.

d. Those with a program entry form from Headquarters may attempt to qualify at either local qualification trials or regular sanctioned AMA Indoor contests, without payment of further qualification fees.

e. Contest Directors of qualification, quarter or semi-finals meets may fly in those meets provided that two contestants or other officials time the CD's flights. The CD of the Finals meet, however, may not fly in that meet.

2. Local Qualification Trials

a. An unlimited number of local Qualification Trials may be held in the U. S., between January 1 and April 30, 1969. Each Trials shall be sanctioned through normal channels as for AMA contests and have a minimum of four entrants who hold a current AMA membership card with FAI stamp. Each contestant may enter any or all the local Qualification Trials in his Zone. FAI Rules shall apply

at each Trials, except that "rounds" need not be flown. Any ceiling height may be used for each Trials. All entrants who score at least 60% of the winning time at any Trials shall qualify for entry in the Quarter Finals.

b. A contestant at a regular sanctioned AMA Indoor contest, held between Jan. 1 and April 30, 1969, may qualify by scoring at least 60% of the winning time for that contest. Same AMA membership and FAI stamp requirements. Model flown in the contest must qualify for FAI Indoor.

3. Quarter Final Trials

a. Quarter Final Trials may be held in any ceiling height, and must be completed by May 31, 1969. FAI Rules shall apply, except that rounds need not be flown. All qualifiers from local Qualification Trials may enter any Quarter Finals anywhere, but only one. Top 80% qualify. Entry fees: Junior and Senior - $1, Open - $3.

4. Semi-Final Trials

Zone Semi-Finals will be scheduled one per Zone only. Entry fee - $5 per entrant and must be completed by June 30, 1969. Any ceiling height may be used, and full FAI rules will apply, including the use of rounds. Qualifiers from Quarter Finals in any Zone may enter any Semi-Final in any zone but only one Semi-Final. The top three (3) from each Zone shall qualify for entry in the Finals; if less than 5 enter any Semi-Final, the top 50% will qualify for the Finals.

5. Team Selection Finals

The Finals shall be flown sometime during the summer of 1969, with FAI rules to be strictly observed, at a central U.S. Location. Entry fee $5 per entrant, and the top 3 fliers shall represent the U.S.A. at the 1970 World Indoor Championships.

As an aside to the program rules above, some emphasis should be given to the matter of notification of next in line. If a qualifier finds himself unable to enter the next scheduled round, he is obligated to notify the first runner-up from the same Trials that he qualified from. In the 1967 Team Selection Program, this practice was not followed by a few fliers. Thus a few alternates could have advanced to the next round and did not.

INDOOR RULES

Contest Board Action

Recent FFCB action adopted major portions of one proposal and two cross proposals (FF67-A-1, -A-2, -A-3, as published in the Feb. '68 Model Aviation section of AAM.)

This action will change, effective Jan. 1, 1969, the indoor records picture. The new listing of events will be as follows:

Hand Launch Glider
Helicopter
Autogyro
Ornithopter
Rise Off Ground Stick Model - 30 sq. in. max.
Indoor Stick Model - 300 sq. in. max.
Paper Covered Indoor Stick Model - 100 sq. in. max.
Rise Off Ground Cabin Model - 150 sq. in. max.
FAI Indoor Stick - 65 cm max. span

For those fliers who will say they never heard of this proposal, Jan. '68 and Feb. '68 INAV called attention to the full text of the proposals and an error that appeared in the text. Further, the full text of this proposal has appeared twice in INAV in past years.

The records slate will not be wiped clean, as for some rules changes. Rather, the highest time in "B", "C" and "D" Stick will become the new record - in this case, the 19:30.2 C Stick record by Hewitt Phillips will be the new single Cat. I record. Similarly, the Cat. I Cabin record will be Hal Crane's 9:42.4 (formerly C Cabin).

CONTEST CALENDAR

GEORGIA - Atlanta area. The Decatur Flying 8-Balls MAC 1st Annual Indoor Contest, Nov. 17, 1968. Site is the Cumming High School Gym, a reasonably clear dome about 30' usable. Easy B and HLG (Jr. & Sr-Op.); Paper Stick and Indoor Scale (all ages combined). Warren Lawrence, Box 225, Decatur, Ga. 30031.

MARYLAND - Silver Spring. Indoor Sessions, 7 pm to 11 pm, at John F. Kennedy High School gym. Nov. 22, Dec. 6, Dec. 20, 1968. Jan. 3, Jan. 17, 1969. School address is 1901 Randolph Road, Silver Spring, Md. Bill Saunders, 11613 Le Baron Terrace, Silver Spring, Md. Ph. 301-593-7196.

MASSACHUSETTS - M. I. T. Indoor sessions at M. I. T. Armory, 3 pm to 6:30 pm. Nov. 16, Dec. 14, 1968; Feb. 1, 1969. Contest Mar. 15, 1969, 1:30 pm to 8:30 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. 01778

OKLAHOMA - Tulsa. Tulsa Glue Dobbers Jingle Bell Jamboree, Class A Indoor Meet, Dec. 8, 1968. Trophies 1st only, expert/novice breakdown in HLG, Easy B, Indoor Stick. Events: HLG, Easy B size paper covered, Paper Stick, Indoor Stick, Indoor Scale. Bob Hanford, 3838 South 88th E. Ave., Tulsa, Okla. 74145.

PENNSYLVANIA - Philadelphia. Sky Pirates MAC 2nd Annual Indoor Model Contest, Philadelphia Convention Hall, 34th & Curie Ave., Nov. 17, 1968, 9 am to 5 pm. Events: HLG - Jr. & Sr.-Op.; Easy B (special rules; contact CD) - Jr.-Sr. only; Paper Stick - all ages combined; Indoor Stick - all ages combined; Indoor Scale - Jr. & Sr.-Op. CD: Charles Danila, 12111 Covert Rd., Philadelphia, Pa. 19154. Ph. NE 7-4034.

TEXAS - Dallas/Ft. Worth/Denton. Cat. I Indoor Contest, Nov. 30, 1968, 9 am to 6 pm. Site is ballroom at Texas Woman's Univ., near junction of University and Bell Avenues. Events: HLG, Easy B and Indoor Endurance (all rubber events flown against current record). Special classes and awards for Sub.-Jr. and Jr. CD: Dick Ganslen, 1204 Windsor, Denton, Tex. 76201, ph. 817-387-1969.

NEWS FROM AROUND THE WORLD

NEW YORK - LONG ISLAND

The LIAMAC Indoor Championships was the first major indoor meet of the winter season, and had a good turn-out. 34 entries in 6 events turned good times under the 50' high dome:

	Junior HLG		Sr.-Op. HLG	
1.	Ron Stransky	0:51.9	Karl Birkel	1:11.0
2.	Bruce Paillet	0:49.9	Ed Franklin	1:07.1
3.	Ken Fitch, Jr.	0:47.0	Jean Paillet	1:04.5
4.	Barry Paillet	0:45.9	Jim Daley	1:03.0
5.	Bob Sylvia, Jr.	0:28.7	Pete Nishanian	1:00.1
	Indoor Stick		**Easy B (Jr. only)**	
1.	C. V. Russo	14:17.0	Richard Nawoyshi	4:45.0
2.	Ed Archer	13:24.8	Ken Fitch, Jr.	4:18.6
3.	Jim Daley	9:16.3	Michael Daley	4:00.8
4.	Dan Domina	8:34.5	Barry Paillet	3:51.7
5.	Jim Vales	7:32.4	Mark Daley	3:21.5
	Paper Stick		**Indoor Scale**	
1.	Jim Daley	9:49.2	Ed Archer	153.8
2.	Ed Archer	9:46.7	Ed Beshar	144.0
3.	Dan Domina	8:59.0	Don Garofalow	140.2
4.	Karl Birkel	7:46.6	Jim Daley	126.2
5.	Chester Wrzos	7:10.5	Salvatore Alu	105.5

TEXAS - DALLAS/FT. WORTH/DENTON

Two record trials and several impromptu sessions have set the tone of future performance - if you make allowance for variable conditions prevalent in the TWU ballroom. Bob Champine now holds the site record with 18:16, done with an almost-Richmond FAI model. Stan Chilton and Bud Tenny have topped 16 and 17 minutes repeatedly, and Jim Clem is consistently over 15 minutes. On the HLG scene, Tom Peadon, Dick Mathis and Frank Jarratt have worked up into the 33+ second range, which spells misery for any who hope to win at HLG this season!

A LOOK AT YESTERYEAR

The June '68 INAV presented the Jasco Beam Scale as a reminder of times past. One of the first to comment was Frank Zaic himself; he gives the following background.

It was my first item and was advertised in the Classified section of Model Airplane News. And on several occasions the 50¢ that came with the order meant that I could eat that day.

The metal parts were selected from the Stimpson catalog and the total cost may have been 5¢. Anyone looking close would see parts that normally were used for low cost thermometers - - also hour hands that were used on those "Will Come Back At" signs. The big stroke of luck was the pivot fitting with an exact 1" spacing.

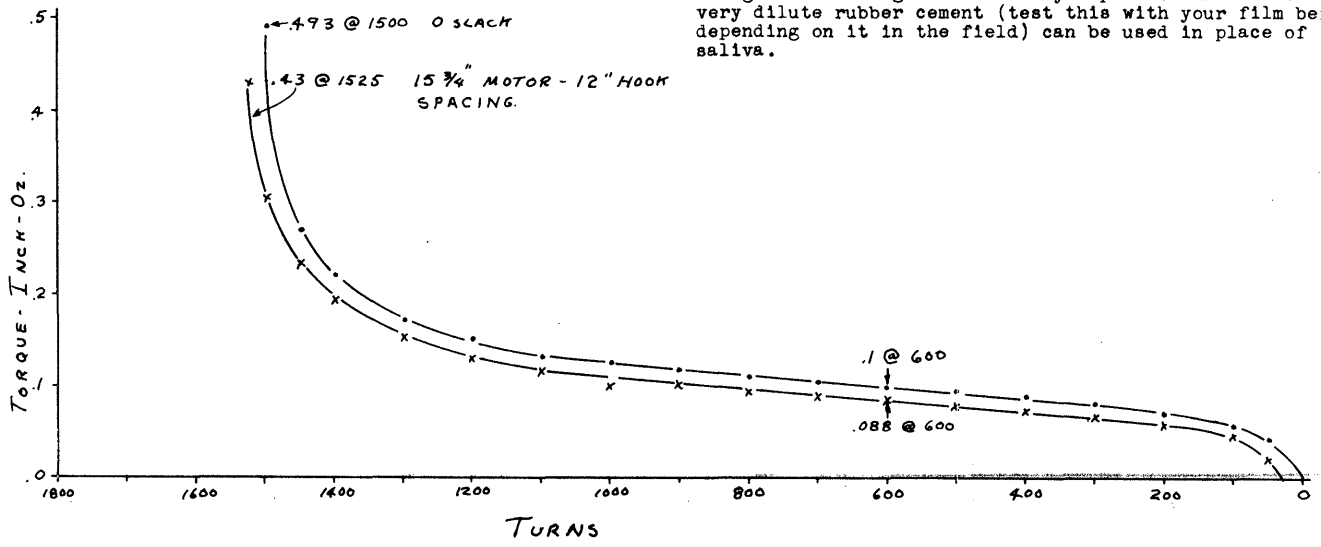
The weights would normally be on the expensive side, but I hit on the idea of having enamelled wire weighed on an accurate scale and then determining how many inches it took to make .1 oz. and .01 oz. A wire gage was selected so variations in length of 1/4" would mean an error of less than 1/6400. The wire was then wound on a mandrel in a hand drill. And all this for only 50¢.....

RECORDS? MAYBE!

TULSA GLUE DOBBERS Cat. I Record Trials, Oct. 25, 1968
School Gymnasium - 21' ceiling
Junior B Stick - 9:44.0, Bobby Dunham
Junior FAI Stick - 9:15.6, Bobby Dunham
Junior B Cabin - 5:26.0, Bobby Dunham
TULSA GLUE DOBBERS Cat. II Record Trials, Nov. 2, 1968
Air National Guard Hangar, 42' FAI, 56' AMA
Junior B Stick - 15:58.2, Bobby Dunham
FAI Cat. II FAI - 19:16.8, Stan Chilton
DENTON, TEXAS Cat. I Record Trials, Oct. 27, 1968
Ballroom at TWU, 24.5' FAI, 30.5' AMA
AMA Cat. I FAI - 17:20, Stan Chilton

PIRELLI LORE

The amount of slack in a motor (before it is wound) is important in determining the actual value of the average torque. As can be seen in the plot below the shape of the two curves is almost identical. The upper curve was taken with zero slack - 15 3/4" motor length before winding, and 15 3/4" hook spacing. The lower curve was taken one hour later with 12" hook spacing, and gave 12% lower average torque.



HINTS AND KINKS

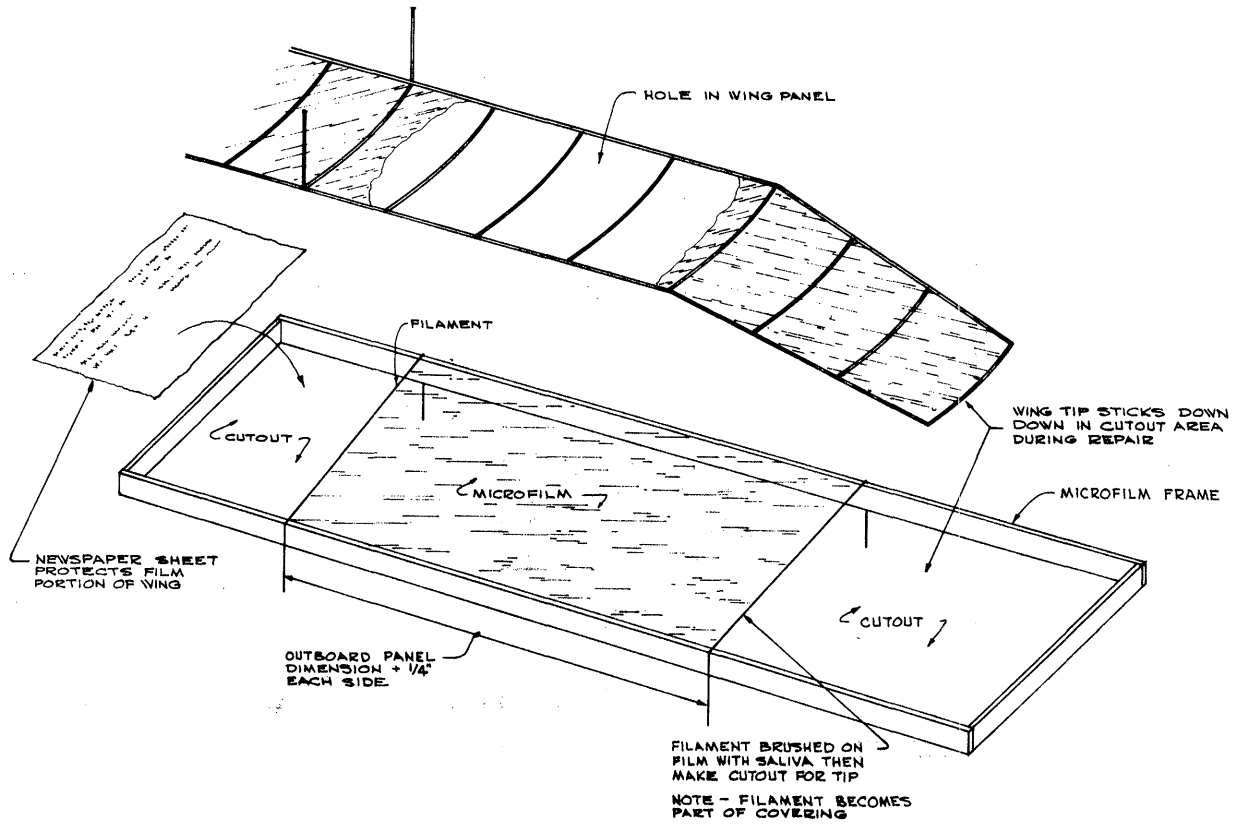
Loose Wing Post?

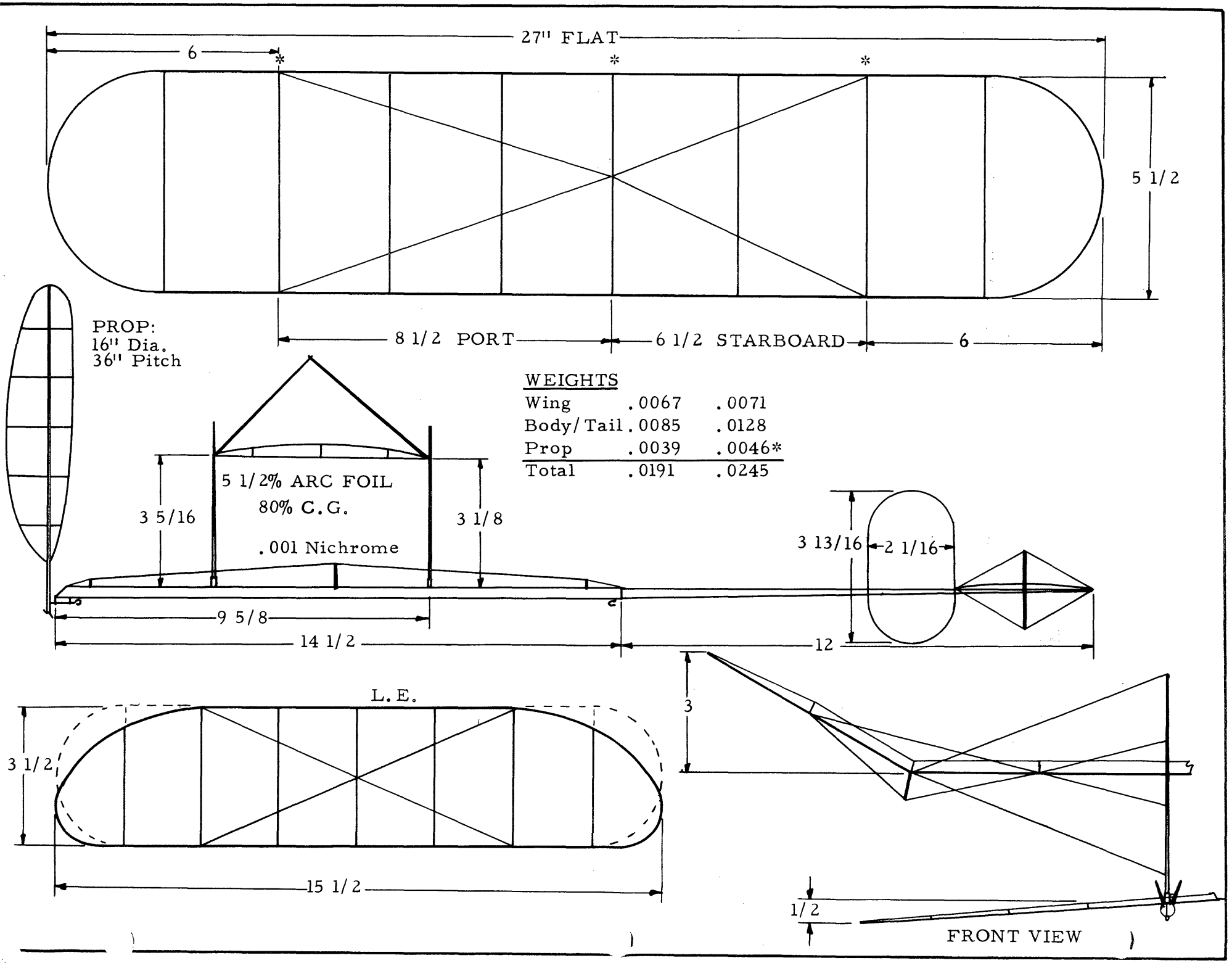
Bob Randolph suggests that a thin coat of rubber cement will make a loose wing post fit nicely. It is more permanet than using water to swell the wood for proper fit and is still adjustable without sticking.

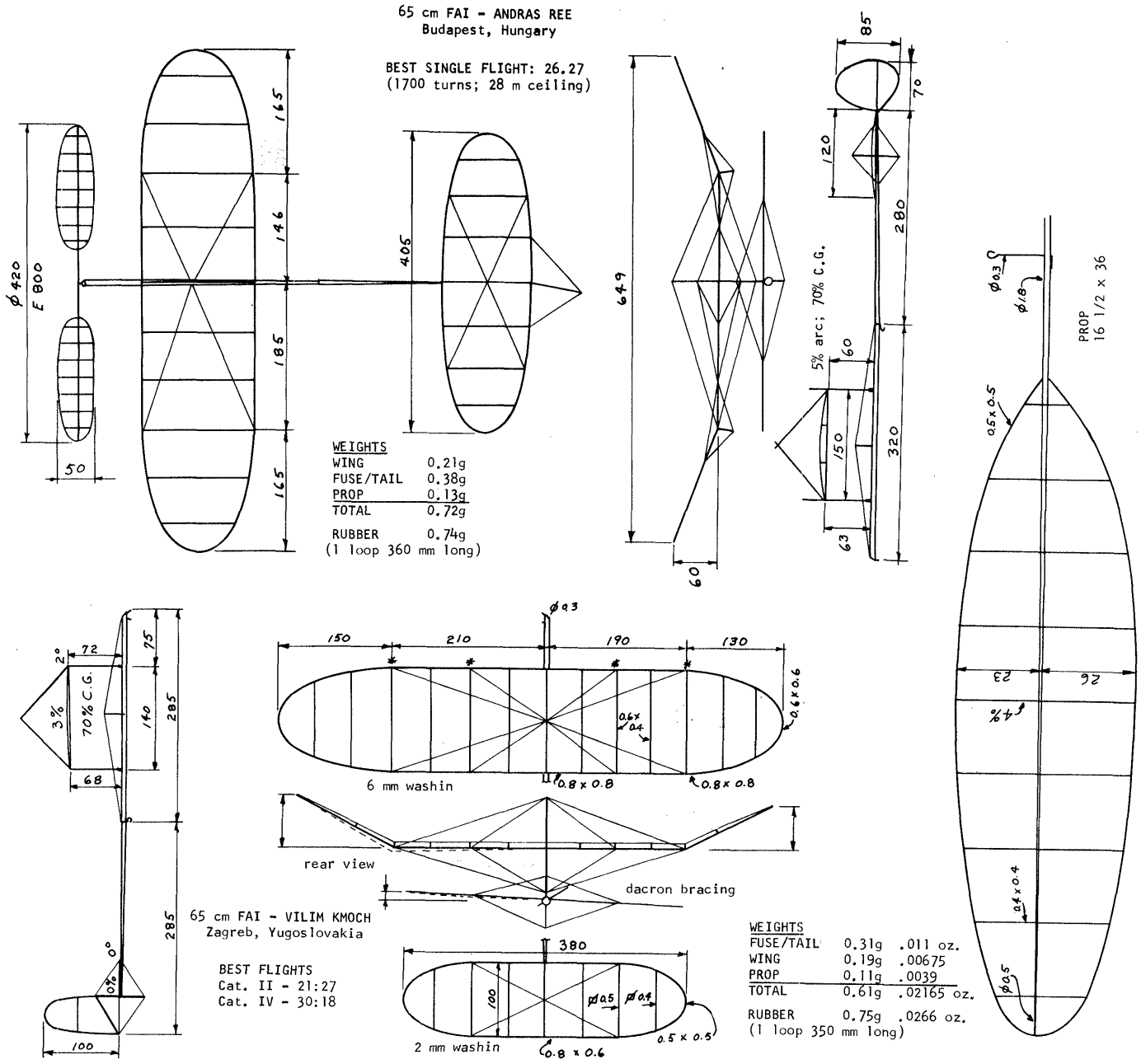
Film Repaired Easily

When Bob Putman lost a large section of covering on a wing, he was able to repair it neatly and quickly by the method sketched below. Dacron monofilament was wet down to the hoop with saliva, to support a section of film long enough to make the patch. The rest of the film was stripped from the hoop to allow clearance for the wing tip and cabane (not shown). Top bracing on the damaged side also had to be removed. The wing was lowered onto the hoop and stuck in place. Note that the monofilament becomes a permanent part of the patch. Thanks to Jim Mills for drawing this sketch.

It is also possible to use dacron monofilament to help bridge across large areas when you patch: in some cases very dilute rubber cement (test this with your film before depending on it in the field) can be used in place of saliva.




27" FLAT
6
5 1/2
8 1/2 PORT
6 1/2 STARBOARD
6
PROP:
16" Dia.
36" Pitch
WEIGHTS
Wing .0067 .0071
Body/Tail .0085 .0128
Prop .0039 .0046*
Total .0191 .0245
5 1/2% ARC FOIL
80% C.G.
.001 Nichrome
3 5/16
3 1/8
3 13/16
2 1/16
9 5/8
14 1/2
12
L.E.
3 1/2
15 1/2
3
1/2
FRONT VIEW



STATE OF THE ART

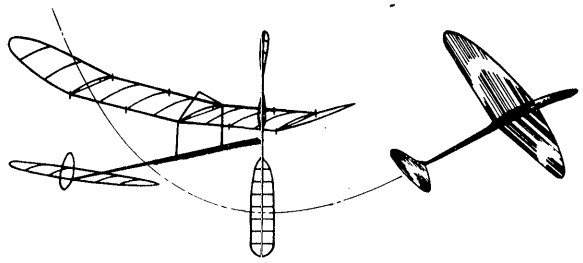
This month's three-way presentation leads off with a composite plan of Jim Richmond models. The basic design differs from the original presentation (July '67 INAV) in that the fin was moved from behind the stab to in front. Two weight schedules are shown, both lighter than the .0267 oz. shown originally. The .0191 was the weight for Jim's 1968 Nats winner, which had the dotted stab outline shown. The other weight schedule is for his West Baden winner, except that the prop weight may have been somewhat different. At the World Champs, Jim flew the Nats winner until it refused to hold together under increased turns needed for winning time. Jim then switched to the West Baden model with a stiffer than normal prop to win with a great 36:18 - 1½ minutes higher than the next closest time. Other slight differences in various models include CG as far forward as 75% and either karma or dacron bracing on wing and stab. An outstanding characteristic of all this design series is a nose-up attitude during the entire flight, and a forward cruise speed lower than most similar models, without undue sensitivity to drift.

The other two models shown represent Yugoslavia (Vilim Kmoch; 8th place at the W/Ch) and Hungary (Andras Ree). Andras was runner-up in the Hungarian team selections with the design shown; I understand he proxy-flew the models of Geza Varszegi, who was unable to make the trip due to illness. The model by Andras can perhaps be considered typical of the Hungarian models, and of many of the other European models besides.

Three differences show up immediately in Vilim's model in spite of the first-glance similarity. The upright fin, integral with the stab bracing, is a neat solution to a problem which is personally vexing. In addition, the stab has zero camber, and the wing airfoil is only 3%. The model is lighter than the other two, with the shortest motor stick. It is interesting to note that all three of these models had almost exactly the same wing loading, in spite of the 7% lower "dry" weight of Vilim's model. A full size copy of Vilim's prop outline will be furnished upon request.

The Voice of N.I.M.A.S. DEC 1968

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

EVA BIDDLE, 2156 Street Rd., Warrington, Pa. 18976
CHARLES R. CARTER, 2291 Gold Star Hwy., Mystic, Conn. 06355
BENJAMIN F. KOON, 1400 MacDade Blvd., A-327, Woodlyn, Pa. 19094
JOSEPH G. SOVA, 977 E. Philadelphia Ave., Youngstown, O. 44502

Family Members

NEAL ROZELLE, 1403 Midlawn Dr., Decatur, Ga. 30032

Kopecky Recovering

We are happy to report that Ernie Kopecky is at home and recovering from his recent heart surgery and hepatitis. He expresses his gratitude for your many cards and letters and says they meant a lot to him.

Season's Greetings

We wish all of you the very best in this Christmas season and the new year to come. It is impossible for us to send cards to all of you, so we use this method to send you our greetings.

Help Wanted!

In this month's PIRELLI LORE, it is explained that good answers to some aspects of pirelli usage depend upon a testing program more comprehensive than I can undertake at this time. Therefore, there is a great need for many people with torque meters to run parts of the test series. Rubber will be furnished - all you have to do is run the tests and summarize the results. Help! Drop a card to Bud Tenny, Box 545, Richardson, Tex. 75080 today!

Decals Needed!

The current supply of NIMAS decals, which were run at cost after the art work was converted into silk screens, is almost exhausted. Does anyone have the capability and inclination to help out?

Site Survey Form

Several years ago it was suggested that a survey of active sites be made and the results made available. The project has dragged for lack of help, but a coordinator is now on the job. The forms should soon be available and on the way to you.

NIMAS Awards

Silver Cat. I HLG Award - 0:28.2, Dan Belieff

Silver Cat. II HLG Award - 0:48.0, Dan Belieff

Gold Cat. II HLG Award - 1:02.5, Dan Belieff

Diamond Cat. II HLG Award - 1:05.0, Dan Belieff

NIMAS Aces

Dan Belieff is the latest NIMAS Ace (see above) and the first flier to become a Cat. II HLG Ace. In spite of the times shown above, he was able to garner only second place at the Philadelphia meet, where those times were flown! The boys play rough now and then!

FAI INDOOR REPORT

Program Suggestions

Clarence Mather has set forth the following goals for the upcoming Team Selection Program:

1. Select the best team to represent us in 1970.
2. Raise money for the Team Travel Fund.
3. Improve the standard of indoor flying.
4. Create more interest in indoor flying.

Of these goals, #1 is obviously the most important, but #2 is also very important. Last time, about 50% of the total Fund was donated from outside the program, and the total was barely adequate to cover the needs. Not many of our fliers can really afford a lot of expense, so a good Fund broadens the field of possible fliers. Goal #3 comes automatically - in fact, the 65 cm birds have improved the average performance tremendously in just one W/Ch round and there is talk of 40 minutes to come!

Clarence has suggested that all CD's holding indoor meets between January 1 and April 31 (time limits for Local Qual. Trials) could help raise money for the Team Travel Fund by running one or more events in the meet as FAI "benefit" events. The method would be to charge a normal entry fee and give nominal prizes; leaving some profit (?) to be donated to the Travel Fund. The same thing could be done at Record Trials - where no prizes are expected anyway.

FAI Rules

The following rules have been taken from the latest edition of the FAI Sporting Code, and are directly applicable to all rounds of the Team Selection Program:

3.4.6 Collision Rule: In the event of a collision between two models in flight, both competitors may immediately choose, either to retain the time of the flight or to recommence the flight.

3.4.7 Steering of model (use of balloon): To prevent a model from colliding with the structure of the building or with another model, a balloon, its line or a stick of 2 to 8 meters long may be used for three 15 second periods during any one flight. The 15 second period shall commence when the steering device first contacts the model, and the contestant may continue steering for the full 15 second period, regardless of the number of intermittent contacts between the steering mechanism and the model. The steering tactic is intended to change the direction of flight only. It must be performed by the contestant. In cases of physical disability of the contestant prior arrangement for a substitute must be made with contest officials.

It is the responsibility of the time-keepers to observe if the use of a balloon, or its line, by another competitor is likely to foul the model which they are timing, and to warn the user of the balloon accordingly.

If however a model is fouled by another competitor, the fouled competitor has the choice of another flight.

3.4.9 Timing of flights: The timing of each flight shall commence when the model is released. Timing shall terminate when:

a. the model lands normally on the floor of the building.

b. when the model comes into contact with any part of the building other than the floor and translational movement ceases, the timekeepers shall continue to time the flight for 10 seconds. Should the model remain in contact with the building after 10 seconds, timing will cease and 10 seconds will be subtracted from the time of flight. Should the model release itself from contact with the building in less than 10 seconds, timing will continue normally.

c. jettisoning occurs.

3.4.10 Number of helpers: The competitor is entitled to have one helper in the starting area.

3.4.12 (partial) Ceiling height definition: The height of the ceiling is defined as the vertical distance from the floor to the highest point at which a circle 15 meters can be inscribed, below the primary structure of the building.

Area Coordinators

The following people have agreed to serve as Area Coordinators in the geographical regions nearest to the address shown:

Joe Bilgri
1255 Blackfield Dr.
Santa Clara, Cal. 95051

Jim Richmond
131 Pamela Dr.
Bensenville, Ill. 60106

Dick Ganslen
1204 Windsor
Denton, Tex. 76201

Bob Champine
360 Abingdon Circle
Hampton, Va. 23369

It should be noted that Local Qualification Trials should be in the planning stage now, even if they are late in the period set for these events. Each event must be cleared in the normal manner with the Dist. Contest Coordinator, but each event should also be cleared with the Area Coordinator listed above. It would also be helpful if each approved date be sent to INAV for publication.

LAST MINUTE BULLETIN: Poland has been chosen as host for the 1970 World Championship. Details when available.

INDOOR RULES

The Free Flight Contest Board has defined built-up fuselage as "a structure assembled from discrete structural members into a framework essentially open in nature; if such a framework is covered, the covering material must not contribute significantly to the compressive strength of a load bearing member."

CONTEST CALENDAR

CALIFORNIA - San Diego
Cat. I indoor contest for HLG, Easy B and Scale late in January. Contact Clarence Mather for details at 3880 Ecochee Ave., San Diego, Cal. 92117.

ILLINOIS - Chicago
Arrangements have been made for indoor fliers to use the Washington Park Armory this winter. Contact Pete Sotich, 3851 West 62nd Place, Chicago 60629 or Al Sortwell 236 Placid Place, Elk Grove Village, Ill. 60007 for info about possible contests or flying sessions.

INDIANA - Kokomo
Chuck Borneman announced an indoor session at the old Purdue Fieldhouse in West Lafayette, Ind. for Dec. 8. If enough interest was shown, more such sessions will be held at the same site. To find out more, and express your own interest, contact Chuck at 1401 W. Taylor, Kokomo, Ind. 46901 or call him at 317-459-3656.

KANSAS - Kansas City Area
HLG & Delta Dart contest, Feb. 15, 1969. 1 pm to 6 pm at a site to be announced. Contact Roger Schroeder, 4111 West 98th St., Overland Park, Kansas for details.

MASSACHUSETTS - M.I.T.
Indoor sessions at M.I.T. Armory, 3 pm to 6:30 pm. on Dec. 14, 1968 and Feb. 1, 1969. Contest Mar. 15, 1969, 1:30 pm to 8:30 pm. Contact Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. 01778.

MARYLAND - Silver Spring.
Indoor sessions, 7 pm to 11 pm. at J. F. Kennedy High School Gym. Dec. 20, 1968, Jan. 3, Jan. 17, 1969. School address is 1901 Randolph Rd., Silver Spring, Md. Bill Saunders, 11613 Le Baron Terrace, Silver Spring, Md. 20902 Ph. 301-593-7196.

MISSOURI - St. Louis
Indoor sessions Jan. 17, Feb. 9; indoor contests Mar. 9 and April ?, 1968. Indoor Symposium Jan. 17, 1968. For details: Jim Gremel, 8618 Jo Court, Berkeley, Mo. 63134, ph. 524-0884; Dick Hardcastle, 1616 Dearborn, St. Louis, Mo. 63122, YO 6-0037; Bob Hotze, 673 Craigwoods Dr., Kirk-Wood, Mo. 63122, TA 2-1257.

VIRGINIA - Hampton
Cat. I RT at Willis School in Hampton, Va. Dec. 28-29 1968, with Easy B and HLG on 12/29 1 pm to 5 pm. Rubber record challenge 3 pm to 9 pm 12/28 and 5 pm to 9 pm, 12/29/68. Hal Crane, 4002 Buchanan Dr., Hampton, Va. 23369

WASHINGTON - Bellevue
Indoor contests in January and March, 1969 at Interlake High School, 16245 N. E. 24th, Bellevue, Wash. Contact John Crosetto, 14809 S. E. 54th, Bellevue 98004, ph. SH 6-2781 for rules and dates.

RECORDS? MAYBE!

PHILADELPHIA SKY PIRATES 2ND ANNUAL INDOOR MEET, 11/17/68
Philadelphia Convention Hall, Cat. II, 80'+ ceiling
Open HLG - 2:14.8, Bob Gutai
DENTON INDOOR CONTEST, Nov. 30, 1968, 30' 6" ceiling
Ballroom, TWU, Denton, Texas Cat. I AMA & FAI
Junior C Cabin - 5:17, Bobby Dunham
Junior HLG - 1:08.2, Bobby Hanford
Open HLG - 1:14.5, Dick Mathis

STATE OF THE ART

The model of the month was flown to a very close second place in the 1968 W/Ch. by Jiri Kalina, and it holds one World Record and a Czech national record. Compare the plan shown with Jiri's '67 Coppa Urbe winner (Oct. '68 INAV) and note design changes in this version. Thanks to Rudolf Cerny for sending this information!

Information not shown on the plan, or not adequately explained follows:

The 30" pitch prop (small outline) was used for the Cat. I World Record and the Czech Cat. IV record. In Cat. I a 12.6" loop of .043 rubber with 1750 turns gave 19:20 in a 6.5 m site, with a substantial amount of ceiling scrubbing. In Cat. IV (the big hall in Brno) a 14.16" loop of .043 rubber and 1950 turns gave 32:24. The Cat. I motor weighed .0214 oz; the Cat. IV motor weighed .0267.

The larger prop outline, with 14.2" loop of .043 rubber and 1950 turns gave two 34+ flights at Rome. The model weight schedule is:

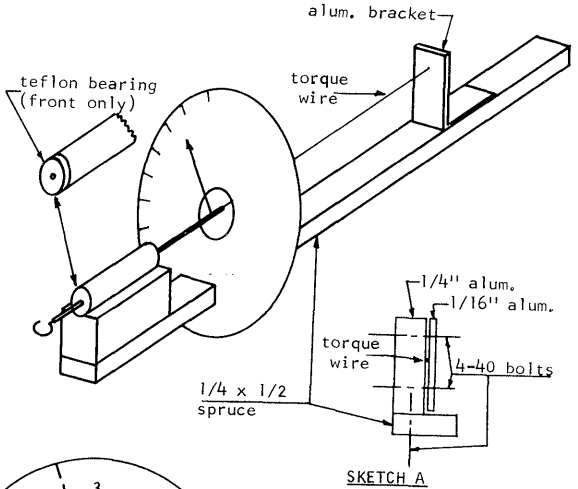
Wing	0.22g	.0078 oz.
Boom/stab/fin	0.11	.0039
Stick	0.20	.007
Prop	0.10	.0035
	0.63g	.0222 oz.
Rubber	0.75	.0266
	1.38g	.0488 oz.

If the printer follows instructions, the model plan is 1/5 size and the props and airfoils are full size.

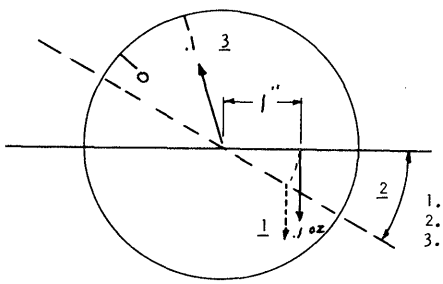
THE LAB

Improved Torque Meter

Some previous issues have shown torque meters, all of which had one fault in common. The scale and pointer were right next to the hook, and a broken motor tends to scramble the pointer or worse. The device sketched below will take a lot of abuse. A single teflon bearing in the front absorbs side loads due to unhooking the motor, and catches broken motors. The torque wire solders into the 1/16" dia. brass tube in front, just behind the scale. At the rear the torque wire passes through an aluminum bracket and is clamped in some fashion so it can be adjusted for zero. An improved clamp is shown in sketch A - this one permits both zero adjustment and minor changes in length (during calibration). Sketch B shows the calibration method. A balanced beam or rod is attached to the front hook, and a .1 oz. weight placed exactly 1" from the center of the hook. Then rotate the torque meter so the beam is level and mark the pointer position on the scale. Do this with the same weight at 1" increments until you have the desired range - a minimum of .6 inch-oz. should be used. On the original device, 2½" of .012" dia. music wire gave .8 inch-oz. of torque in about 300° of rotation.

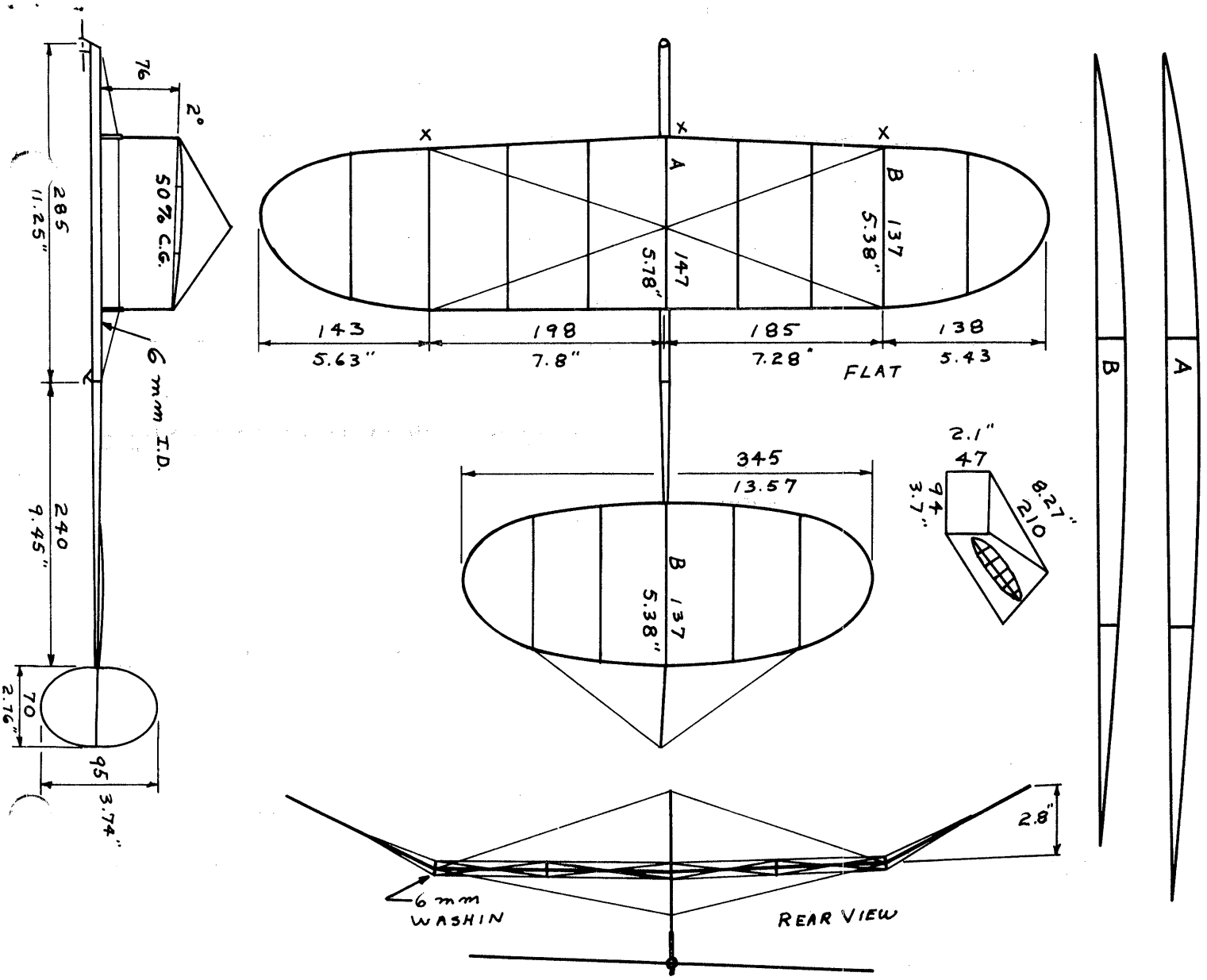


SKETCH A



1. Hang weight 1" from center
2. Rotate beam level
3. Mark calibration point

SKETCH B

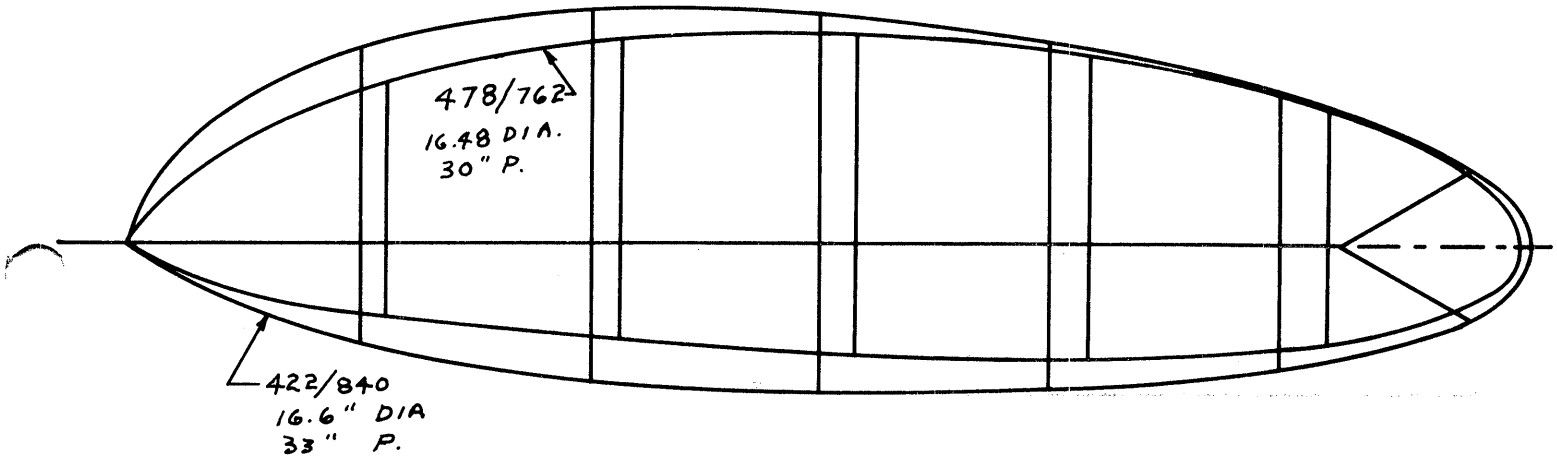


65 cm FAI INDOOR
JIRI KALINA - CZECHOSLOVAKIA
Cat. I World Record - 19:20
Czech Cat. IV Record - 32:24
2nd Place 1968 W/Ch - 69:30

WING:
25 1/2" Projected Span
135 Sq. In. Proj. Area

WEIGHTS

Wing	.215g	.0077 oz.
Stab/Fin	.07	.0025
Stick	.205	.0073
Boom	.04	.0014
Prop	.11	.0039
	.64g	.0228 oz.



PIRELLI LORE

Walter Erbach took rightful exception to the Pirelli Lore material presented in the Nov. '68 INAV. His arguments were basically that a single test result was used to support a general statement; this is a valid objection. He also objected on the basis of tests that he conducted in the past, but I could not accept the test procedure he used. I have decided that my test erred in that the motor was not allowed to rest a minimum of 24 hours (see Sept. '68 INAV) and no effort was made to determine the state of breakin of the motor (no followup made at zero slack). As it stands, the curves presented gave a very good picture of loss of torque due to motor fatigue (or failure to return to original length).

In a long series of tests, I have found the following to affect torque curves: winding technique, amount of rest the motor has, speed of unwinding, speed of reading torque (how long you wait at each point to read torque) amount of breakin the motor has, and amount of slack in the motor before winding.

This series was begun in an attempt to define several characteristics of pirelli, and point the way to more efficient usage of pirelli, since no one has ever admitted knowing these things with enough certainty to tell others about it. In order to overcome several shortcomings in test procedures, I have outlined a better test program. However, such a program would entail far too much investment of time for me to undertake it, since a single test of a single motor represents the better part of an hour. I will furnish motors to anyone who will test them as outlined and return the results for inclusion in future INAV reports. The test can be designed to offset the differences between individual torquemeters and operators, and will yield much significant information. Meanwhile, the information below represents (once again) only a single test motor in each case and indicates a trend rather than an absolute quantity.

One of the most pressing questions raised over pirelli is whether to break-in the motor or just fly it in (fly the model with new rubber and then increase turns and/or shorten the motor as it breaks in). The graphs below give clear evidence that pirelli improves with break-in. Fig. 1 comes from Bob Platt - it shows the first wind and the seventh on an 18" (new) loop of .071 pirelli. The motor was wound to the same torque level each time; about 15 minutes was required to take each torque curve and the motor was allowed to rest 30 minutes before the next wind. Torque was taken with 12" between hooks - which is why the average sustaining torque is lower on the 7th wind (over 7" of slack). The 7th wind had 15% more energy and 22% more turns than #1 wind; average torque was .124 in. oz. for #1 and .122 in. oz. for #7.

Fig. 2 shows winds #1 and #5 on a 15" (new) motor run on 15" hook spacing. Again, extra turns and energy are apparent - note that the average torque is the same, but that wind #5 has a flatter and longer cruise portion. 24 hours rest between winds was allowed, giving somewhat less slack than for Fig. 1.

Fig. 3 gives the best news of all! Taken from the same motor as Fig. 2, it compares wind #1 and wind #6 - but the motor was shortened to the original 15" length and run on 15" hook spacing. Not only does the motor accept 7% more turns at the same torque, but the average torque is 13% higher and the slope of the cruise portion is less.

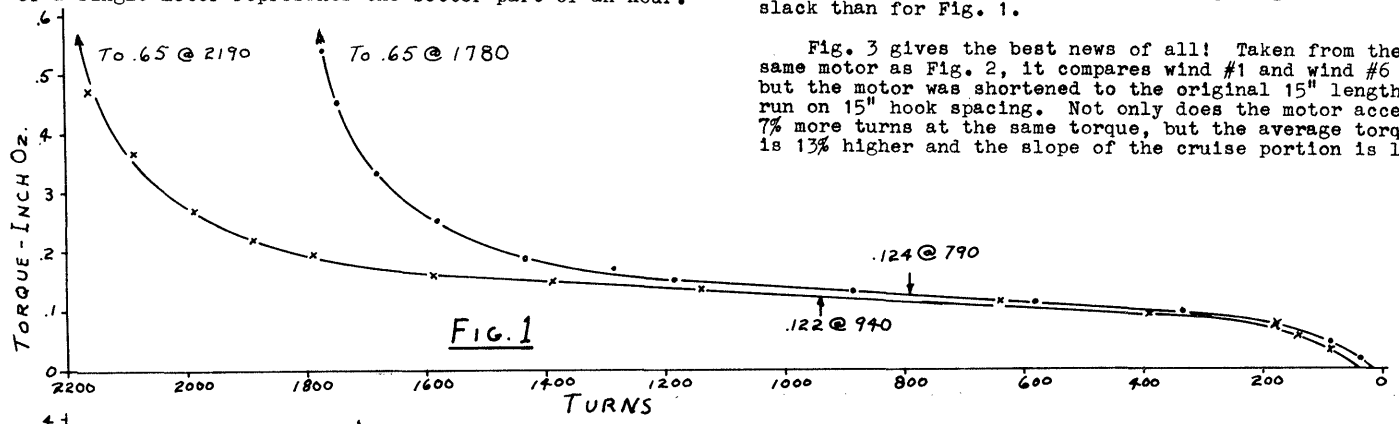


FIG. 1

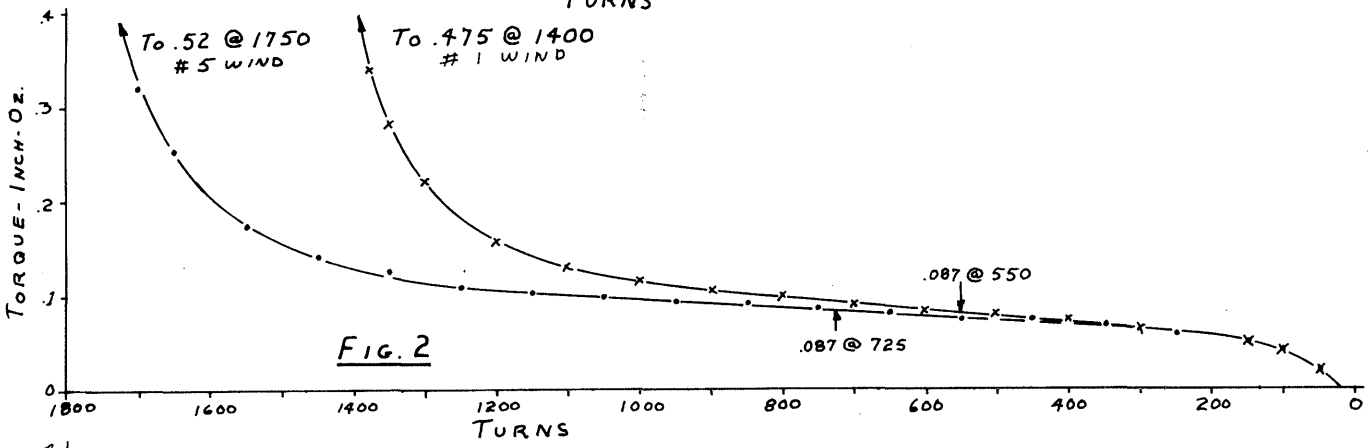


FIG. 2

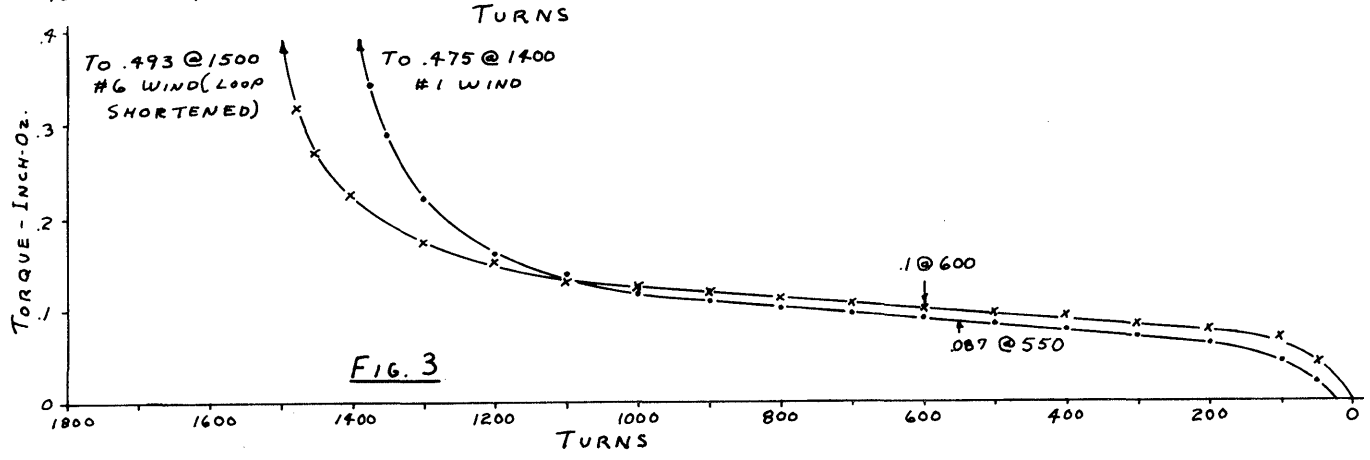
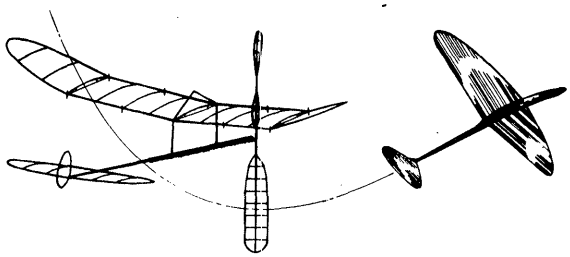


FIG. 3

The Voice of N.I.M.A.S. JAN·1969

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

JOE DEADY, 466 155th Ave.SE, Bellevue, Wash. 98004
DAN DOMINA, 1229 S. Long Ave., Hillside, N. J. 07205
ANNIE GIESKIENG, 1333 S. Franklin St., Denver, Colo. 80210
BENJAMIN F. KOON, Jr., 1400 MacDade Blvd., A-327, Woodlyn, Pa. 19094
HERMAN NEWKIRK, 18595 Marine View Dr. SW, Seattle, Wash. 98166
NICK PANAGIOTOU, 3911 Norton Ave., Oakland, Cal. 94602
PETER PATTERSON, 15042 SE 15th., Bellevue, Wash. 98004
DON STEEB, 955 Milstead Way, Rochester, N.Y., 14624
O. C. STEWART, Box 168, 8060 Spencer Hwy, Pasadena. Tex. 77505
JIM WALTERS, 240 SW 184, Seattle, Wash. 98166

Family Members

BENJAMIN F. KOON III, 1400 MacDade Blvd., A-327, Woodlyn, Pa. 19094
SCOTT NEWKIRK, 18595 Marine View Dr. SW, Seattle, Wash. 98166
JAY PATTERSON, 15042 SE 15th, Bellevue, Wash. 98004

Change of Address

These NIMAS members have requested that their new addresses be published:

BILL HANNAN, P. O. Box 1596, Escondido, Cal. 92025
KEITH VARNAU, 900 W. Belden Ave., Apt. 211, Chicago, Ill. 60614

Bill Hannan is the man who has all those scale model goodies (Graphics), and says that his product lists are available for the price of a 6¢ stamp.

Sorry About That!

In the Nov. '68 INAV, our newest sponsored Junior was introduced as Phillip Lawrey; it should have been Lawry.

In the Dec. '68 INAV, a note pertaining to wingspan and projected area appeared just under the rear view of Kalina's model. Oddly enough, this should have appeared in the Nov. '68 issue, on the plan of Jim Richmond's W/Ch winner! It was a separate note which apparently worked loose from the plan and stayed unnoticed in the plan envelope and then dropped out in December. So, the printer put it where he thought it belonged!

In the Dec. '68 INAV, Bobby Dunham's C Cabin record was listed as 5:17.0; should be 5:14.2.

Dick Black Memorials

At long last two Dick Black memorial lectures are ready for showing. One is on balsa wood selection and cutting, and the other on pouring microfilm. These are slide-tape lectures, using audio tape at 3 3/4 inches per second playing speed and 35 mm color slides. These are to be available to clubs or individuals on a first-come, first-served basis. All mailing will be by first class mail (approximate cost 30¢) and individuals are requested to keep any one lecture no more than 2 days. Clubs can have a lecture 5 days, and a reasonable effort will be made to "bracket" club meeting dates if you request it.

NIMAS Awards

Silver Cat. I HLG Award - 0:24.8, Dick Mathis

Gold Cat. I HLG Award - 0:27.7, Dick Mathis

Diamond Cat. I HLG Award - 0:38.0, Dick Mathis

Silver Cat. II HLG Award - 0:51.0, Dick Mathis

Gold Cat. II HLG Award - 1:01.0, Dick Mathis

Diamond Cat. II HLG Award - 1:07.0, Dick Mathis

NIMAS Aces

Flights made at the '68 Nats and at the Denton indoor meet in November added up to Cat. I and Cat. II Ace rating for Dick Mathis. This makes Dick the first Open double Ace, and only the second to make Cat. II Ace in HLG.

Steering Pole?

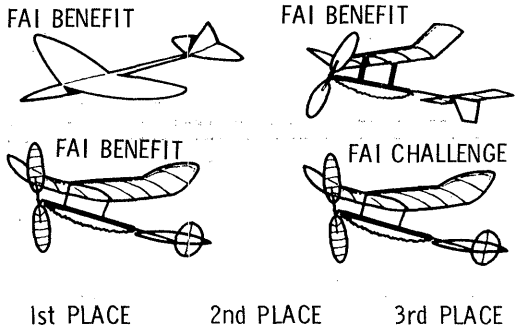
Stan Chilton located a telescoping fiberglass fishing pole, 20' long, that is light, strong and ideal for pole steering. It is available from Sears, Roebuck & Co. for around $10, price depending upon whether you get it from a catalog order or regular store. The store part number is 535-305361, catalog number (Spring/Summer '68 catalog) 6 K 30536C.

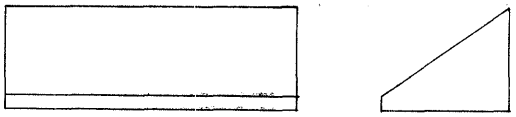
More Volunteers Needed

So far, two people have volunteered to help run some of the tests being set up in support of the PIRELLI LORE series. Four more volunteers with torque meters are needed, besides some help in reducing the data. This last task will consist of averaging results from three motors at each of several stages of the test and producing charts from which graphs will be drawn. Help! Drop a card to Bud Tenny, Box 545, Richardson, Tex. 75080

FAI Benefit Events

It was announced in the Dec. '68 INAV that Clarence Mather (Indoor Team Selection Chairman) had suggested that extra money for the FAI Inboard Travel Fund could be raised by special "team benefit" events. In line with this idea, NIMAS has available trophy "makings" for 55¢ per trophy. You get a piece of mahogany cut to shape and two plates with the design shown below. The wood block needs a light sanding and whatever finish you choose; the plates (one event plate and one place plate) are then put in place with contact cement. The finished trophy is in the form of a paperweight of the shape sketched below. It is 4" long and about 1 1/4" high and 1 5/8" wide. This low cost award scheme permits over 50% of the entry fee (assuming $1 per entry and 4 entries) to be donated to the Travel Fund. The FAI Benefit plates shown below are now available, and the FAI Challenge plate can be made ready in short order. Submit 55¢ per trophy desired, and then refund whatever postage cost it takes to deliver them; send orders to NIMAS, Box 545, Richardson, Tex. 75080.





As an afterthought, it should be noted that benefit meets would not have to involve FAI models, nor would the contestants have to have FAI stamps unless they were trying to qualify for the Quarter Finals.

FAI INDOOR REPORT

Rules Correction

The Dec. '68 INAV listed pertinent parts of the FAI Sporting Code which will be enforced during the Team Selection Program. AMA HQ has informed INAV that the second paragraph of the steering rule beginning with "It is the responsibility ....." was deleted by unaminous vote of the 1967 CIAM meeting. For those with a copy of the Sporting Code, that is Sec. 3.4.7 "Steering of Model" that is affected.

Local Qualification Trials

The following Local Trials have been announced. If your area is not represented, contact the Area Coordinator listed below for more information. If you know of a any Trials now set up but not listed, please notify us at Box 545, Richardson, Texas 75080.

CALIFORNIA - San Diego. FAI Benefit meet & FAI Local, Feb. 1, 1969. Clarence Mather, 3880 Ecochee Ave., San Diego, ph. 273-9396.
OKLAHOMA - Tulsa. FAI Local Jan. 11-12, Feb. 8-9, 1969. Bob Hanford, 3838 S. 88th E, Ave., Tulsa, NA 7-6932
MISSOURI - St. Louis. FAI Local, Feb. 23, 1969, East St. Louis Armory (Cat. I) Dick Hardcastle, 1616 Dearborn, St. Louis, YO 6-0037.
TEXAS - Dallas/Ft. Worth/Denton. FAI Benefit meet, HLG, Easy B, Rubber. Bud Tenny, Box 545, Richardson, Tex. 214-235-4035.
TEXAS - Houston. FAI Contest, Feb. 2, 1969, FAI Local, Mar. 16, 1969. Lars Giertz, 11703 N. Willow Circle, Houston, PA 3-6463.
VIRGINIA - Hampton. FAI Local Jan. 26, Mar. 1, April 5-6, 1969. Bob Champine, 360 Abingdon Cir., Hampton 23369.

Joe Bilgri
1255 Blackfield Dr.
Santa Clara, Cal. 95051

Jim Richmond
131 Pamela Dr.
Bensenville, Ill. 60106

Dick Ganslen
1204 Windsor
Denton, Tex. 76201

Bob Champine
360 Abingdon Circle
Hampton, Va. 23369

CONTEST CALENDAR

CALIFORNIA - San Diego. Indoor meet, HLG, Easy B, Indoor Stick. Feb. 1, 1969, Colina del Sol Auditorium, 54th & Orange St., 8 am to 5 pm. Clarence Mather, 3880 Ecochee Ave., San Diego, Cal. 92117. Practice flying same site Jan. 12, 1969.

INDIANA - West Lafayette. Purdue Aeromodelers plan a meet in February. Perdue Fieldhouse, 65' ceiling, 150' x 180' floor area. Chuck Borneman, 1401 W. Taylor, Kokomo, Ind. 46901, ph. 317-459-3656.

KANSAS - Olathe. HLG & Delta Dart contest at Olathe NAS Drill Hall. Feb. 15, 1969, 1 pm to 5 pm. Roger Schroeder 4111 West 98th St., Overland Park, Kansas.

MASSACHUSETTS - M.I.T. Indoor session at MIT Armory, 3 pm to 6:30 pm, Feb. 1, 1969. Contest Mar. 15, 1969. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. 01778.

MARYLAND - Silver Spring. Indoor session at JFK High School, Jan. 17, 1969. School is at 1901 Randolph Rd., Silver Spring, Md. Bill Saunders, 11613 Le Baron Terrace, Silver Spring. Md. ph. 301-593-7196.

MISSOURI - St. Louis. Indoor sessions Jan. 17, Feb. 9; indoor contests Mar. 9 and April ?, 1969. Indoor Symposium Jan. 17, 1969. Jim Gremel, 8618 Jo Court, Berkeley, Mo. 63134 ph. 524-0884.

OKLAHOMA - Tulsa. Cat. I RT & contest Jan. 11-12, TGD 2nd Annual Indoor Contest Mar. 9 (?), 1969. Bob Hanford, 3838 South 88th E. Ave., Tulsa 74145 ph. NA 7-6932.

TEXAS - Dallas/Ft. Worth/Denton. FAI Benefit meet, HLG, Easy B, Indoor Rubber. Bud Tenny, Box 545, Richardson, Tex. 75080 ph. 214-235-4035.

TEXAS - Houston. Indoor sessions Jan. 12, Mar. 2, 1969 6 pm to 11 pm. Gene Simpson, 4327 McDermed Dr., Houston, Tex. 77035 ph. PA 3-8413.

RECORDS? MAYBE!

BRAINBUSTERS RECORD TRIALS, 12/28-29/68, Cat. I
Willis School, Hampton, Va. 20' 6" ceiling.
Open B Cabin - 8:09.2, Tom Vallee
Open B Stick - 17:13.5, Tom Vallee
Open FAI Cat. I FAI - 17:54.8, Hal Crane
Open AMA Cat. I FAI - 17:41.0, Hal Crane
Open D Stick - 17:21.4, Hal Crane
Open Helicopter - 6:55.9, Tom Vallee

STATE OF THE ART

Here is another composite plan - Stan Chilton's B/FAI model in two versions. For the basic model, check back to Dec. '67 INAV (Goldilox - 1967 version). From a 5% wing thickness and 50% CG, Stan has advanced to 100% CG and thicker airfoils as noted on the plan. Goldilox II was the version which set the 17:52 World Record (he held the record for three weeks) and held (until last week) the B Stick and both the FAI and AMA Cat. I FAI records. Goldilox III exceeded the B Stick and FAI Cat. I FAI records under somewhat poor conditions on Nov. 30, 1968, but with no sanction in force to qualify the 17:20 time. G-III is visibly better in the air, and the flaring prop looks much more efficient in flight. Stan's models are extremely well constructed, flawless and clean. These models are very well developed; perhaps the best developed B Stick design we have witnessed. Note that G-II set the records on rubber weighing 73% of the airframe weight - this is possible because the model will climb for about 9 minutes when launched with .12 inch-oz of torque - and probably flies level at .08 inch-oz, perhaps the lowest torque during level flight of any model of comparable size. The major departure of this model from normal practice is the reduced pitch near the prop hub. No one can explain just why such a prop should work, but Stan's props produce an improvement in performance on other models with no other changes.

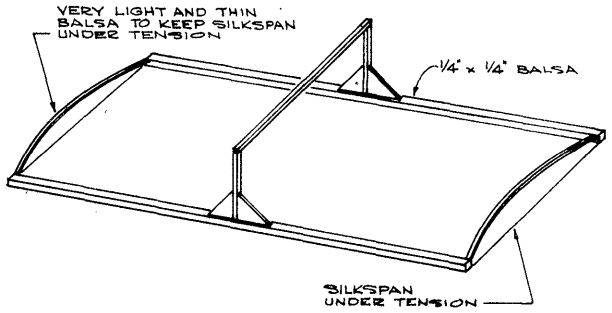
POSTAL CHALLENGERS

Pete Paterson, Jim Walters, Joe Deady and Herman Newkirk, members of the Boeing Hawks who joined en masse this month, offer a challenge for Cat. I Easy B and HLG to any clubs willing to take them on. Their sites are 20' and 23' high, and they will use standard NIMAS fudge factors.

HINTS AND KINKS

Kopecky Covering Frame

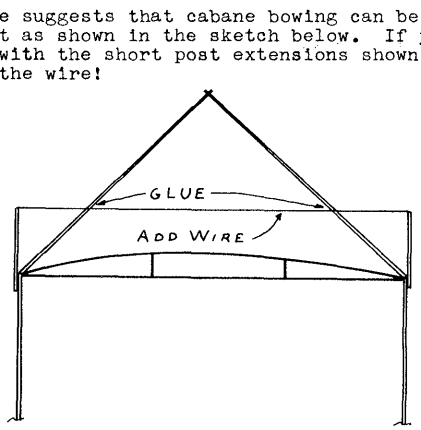
The sketch below amply covers the construction of this useful gadget by Ernie Kopecky. In use, the frame is covered by placing it directly on the storage hoop; the film can be caused to adhere to the frame either by water or by rubber cement (rubber cement is probably preferable). It is then placed over the surface to be covered. The wing or stab has previously been wet down to the board in typical Bilgri covering style. As the covering frame is lowered over the wing, the light balsa end strips permit the film to conform to the rib shape; thus giving a smooth covering job with little extra effort. Thanks to Jim Mills for drawing up this sketch.



KOPECKY COVERING FRAME

Weak Cabane?

Hal Crane suggests that cabane bowing can be prevented by bracing it as shown in the sketch below. If you now use bracing with the short post extensions shown, all you need add is the wire!



WEIGHTS	GOLDILOX II	GOLDILOX III
Wing	.0066	.0055
Prop	.0036	.0036
Stick + Tail	.012	.010
Total	.022	.0191
Rubber	.016	.0222
Total	.0381	.0413

GOLDILOX II

PROP - 4% .014 x .020

WING - 6% .014 x .022

STAB - 5%

.012 x .020

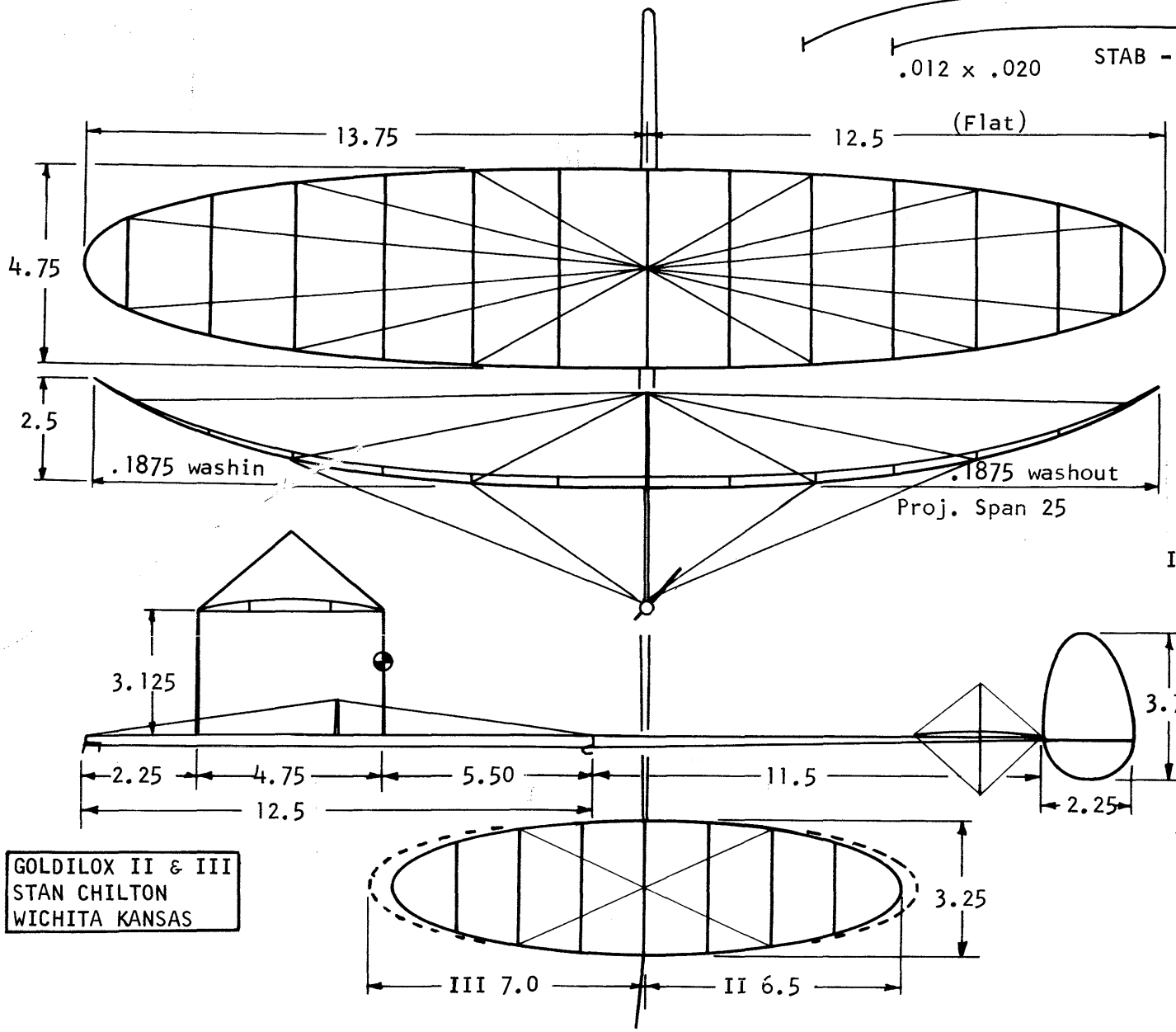
GOLDILOX III

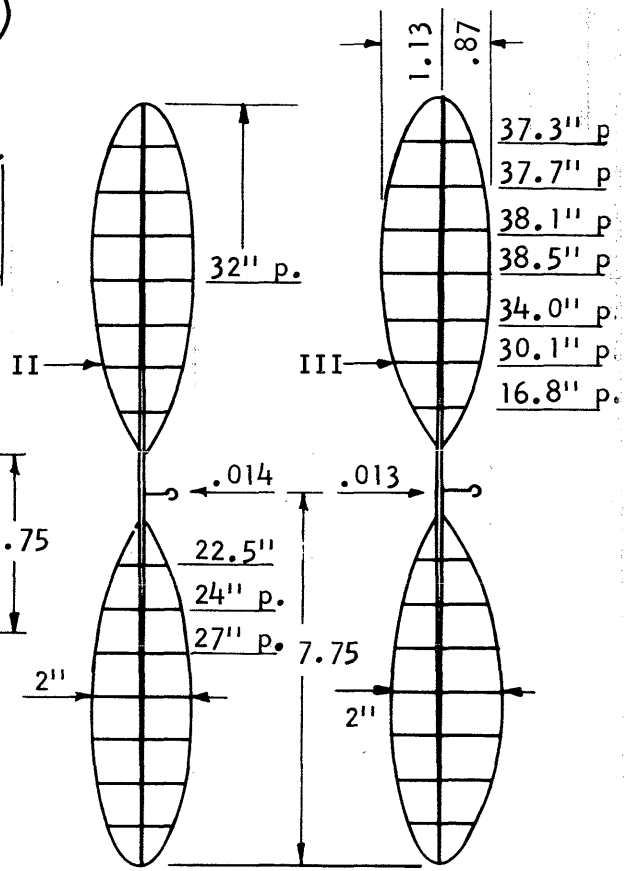
PROP - 4% .014 x .020

WING - 8% .014 x .022

STAB - 5%

.012 x .020





GOLDILOX II & III
STAN CHILTON
WICHITA KANSAS

DESIGN FOOTNOTES

Constant Margin of Stability

Several months ago, a method of CG location was outlined. The method and discussion was based on Fig. 1 below, which came from an article by Hank Cole in Dec. '47 Air Trails. This graph has since become available in a metal plate for tool box use and is designated NIMAS Chart number III.

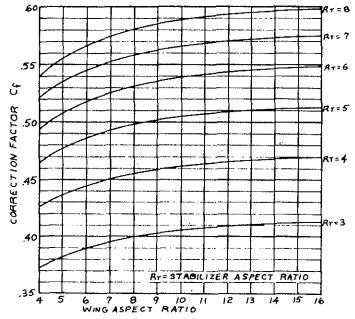
When this chart and discussion was printed, I had no experience in applying it to indoor. No doubt some of you suffered the same frustration as I did in applying this method to indoor models. The difficulty is that the chart assumes a fixed wing location, and ballast to locate the CG properly. Indoor models with wing location shifted to locate the CG properly force you to use a series of successive approximations - very tedious work.

So, why bother? The chart sets up a fixed margin of stability; different designs of similar weight adjusted to the same margin of stability fly in almost identical fashion. This is not necessarily true for models adjusted to have identical CG locations (such as 70% CG). To illustrate, consider two models of identical design but with different location of CG with respect to the thrust bearing. The model specs are: rectangular wing, 4" x 25" projected (100 sq. in., aspect ratio 6.25:1); stab, 2.8" x 12" (32.8 sq. in., A/R 4.3:1); 12" motor stick and 12" tail boom. In Fig. 2, Model A balances 6" from the nose, while model B balances 9" from the nose. Both models are assembled so the CG falls at 75%.

Let's figure the margin of stability on these models. Referring to Fig. 1 (Step 1) and Fig. 2, the tail moment of Model A is 17.9". C_f for both models (Fig. 1, Step 3) is .46. Computation of A.C. (aerodynamic center) for both models locates A.C. of model A 2.7" aft of the 25% chord; on model B the figure is 2.25". Both models have a 75% CG location; the margin of stability of A is .7"/4" = 17.5%, but on B the margin is .25"/4" = 6.25%. A 5% margin is about the most sensitive set-up which will fly well in average conditions, so model B is close to a critical adjustment and model A is too stable for best results.

As mentioned before, application of the principle of constant margin of stability is mathematically tedious. Fig. 3 illustrates a model (same design as A and B) with pertinent dimensions labelled to illustrate a graphical approach to constant stability margin. Tail moment arm will be 9.9" + 3" + Z. For this example, let the margin of stability = 5%. Thus, dimension "M" is .05 x 4" = .2", for all models built to this design. Compute A.C. for Z = 1" (A.C. = 2.10") and Z = 6" (A.C. = 2.85").

If Z = 1", Y = 11"; for Z = 6", Y = 6". Referring to Fig. 3, for the case of Z = 1", the CG will be 1.1" ahead of the wing TE. (AC is 3" - 2.10", or .9" ahead of the TE; M = .2", so the CG is 1.1" from TE). Thus, since Y is 11", X = 9.9". Similarly, for the case Z =6", X = 5.65". Graph these two points (Fig. 4) and connect these points with a straight line. This line is the locus of all practical locations for the wing trailing edge, given the condition that the stability margin is 5% of the wing average chord. In the case of models with flying surfaces not rectangular, the graph is the locus of locations of the 100% average chord line, not the root chord.



METHOD FOR DETERMINING POSITION OF C.G.

STEP I Measure tail moment arm between 25% point on the average chord of wing and stab. AV. CHORD = Area/Span

STEP II Find Aspect Ratio of Wing and Stab. Aspect Ratio = Span/Av. Chord or $Span^2/Area$

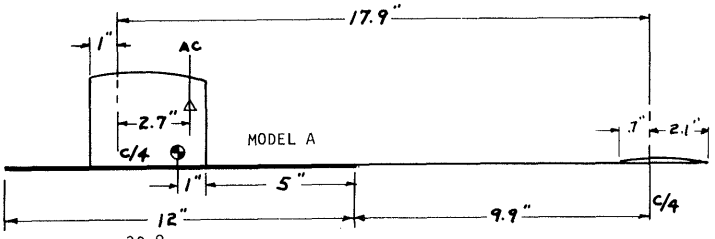
STEP III Find C_f from graph

STEP IV Find distance from 25% point of wing to A. C. A.C. = $\frac{\text{stab area}}{\text{wing area}}$ x Tail Mom. Arm x Cf

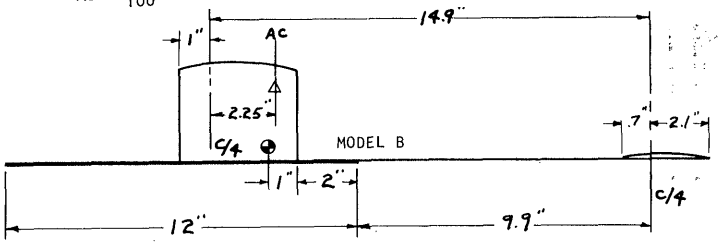
STEP V Locate C.G. 25% of average chord ahead of A.C.

FIG. 1

To summarize, compute the factors of Fig. 4, using a fixed stability margin. Balance the model, complete with prop and motor but minus wing, and measure distance X. Read Y from the graph and locate the wing TE accordingly. All models of similar size and weight, with the same margin of stability, will react to gusts and rafter-banging in very similar fashion. Constant stability margin is far more reliable for insuring good performance, in my opinion, than a specified CG location with regard to the wing.

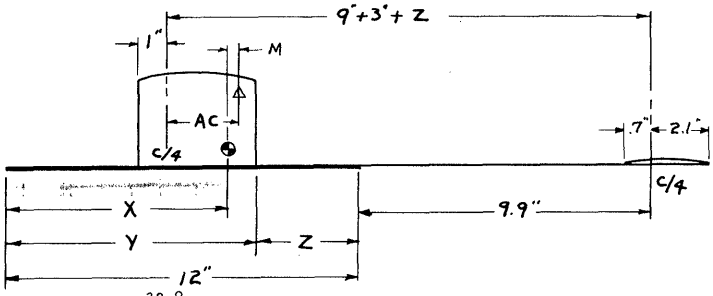


AC = $\frac{32.8}{100}$ x 17.9 x .46 = 2.7 CG is .7"←AC



AC = $\frac{32.8}{100}$ x 14.9 x .46 = 2.25 CG is .25"←AC

FIG. 2



AC = $\frac{32.8}{100}$ x 13.9 x .46 = 2.1 (Z = 1")

AC = $\frac{32.8}{100}$ x 18.9 x .46 = 2.85 (Z = 6")

FIG. 3

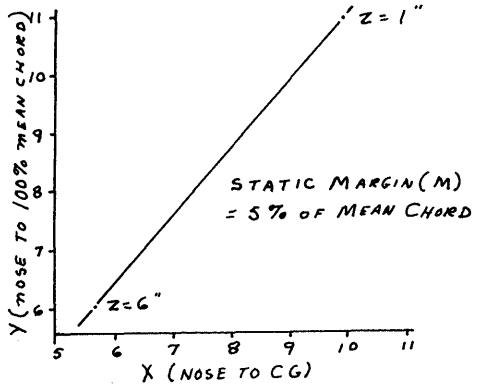
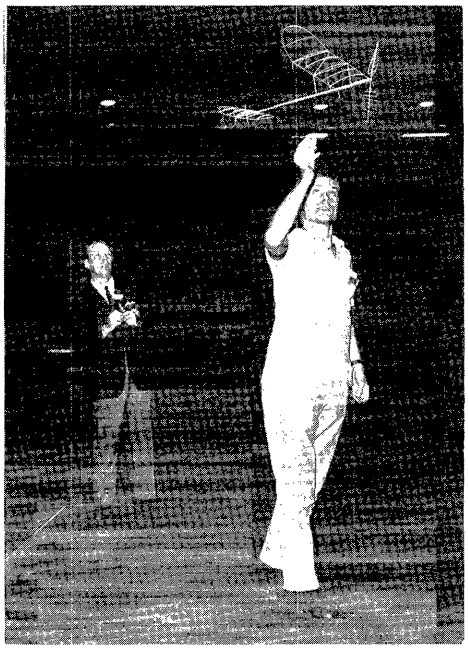


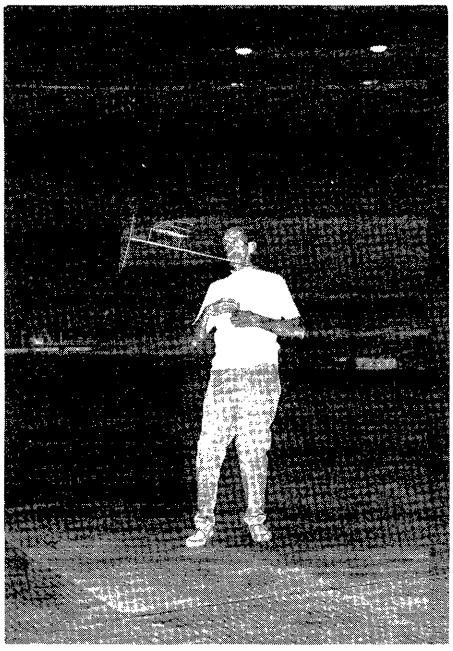
FIG. 4

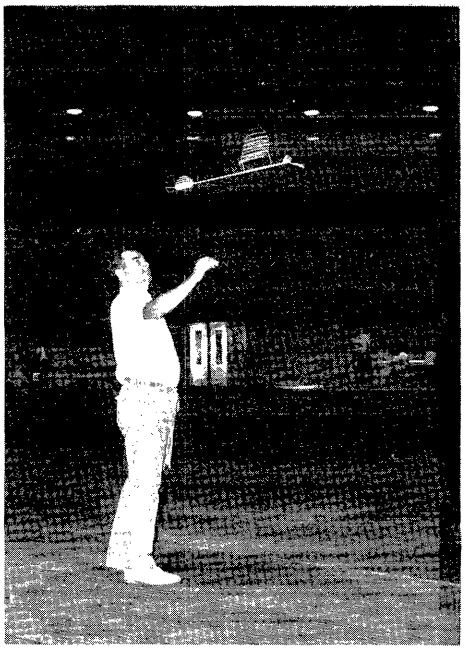
ROME - THE PICTURE STORY

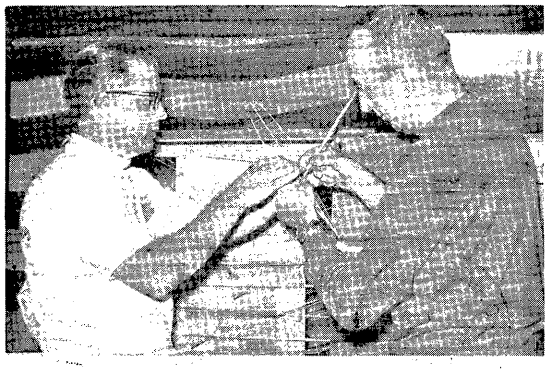
The pictures on page 5 were made available by Jim Richmond (pictures taken by a member of the Italian Aero Club) and by Eduard Chlubny of Czechoslovakia.

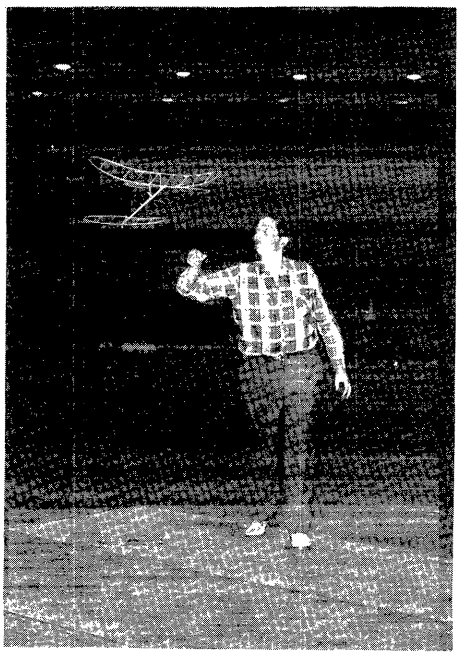
Top Row: Gunter Maibaum & Werner Wetzel (Germany); Clarence Mather; Gabriel Leopold (Yugoslavia).
Middle: Al Rohrbaugh (US) and Egizio Corazza (Italy); the Czech team - Jiri Sitar, Jiri Kalina, Eduard Chlubny.
Bottom: Hans Beck (Germany); Teodor Strasberger and Gabriel Leopold (Yugo); Manfred Koller (Austria).

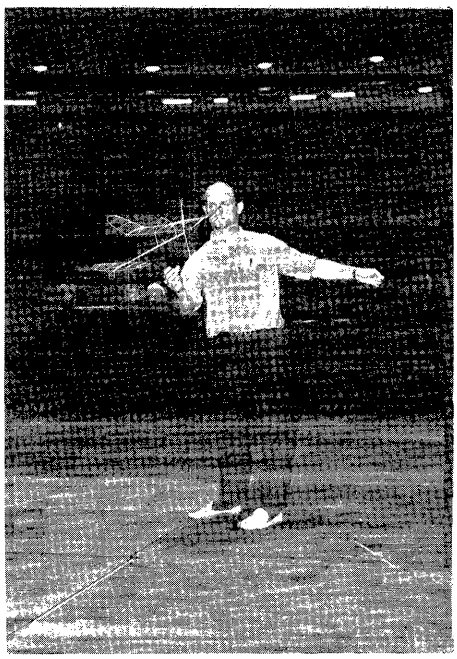






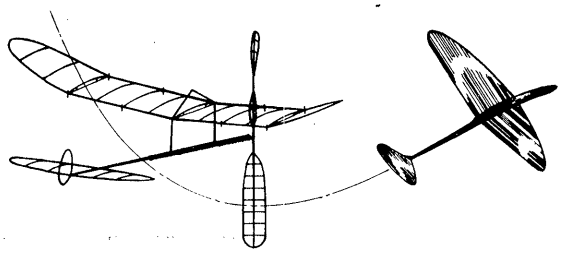






The Voice of N.I.M.A.S. FEB·1969

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

H. T. ADAMS, JR., P. O. Box 491, Rome Ga. 30161
BERNIE BISHOP, 2706 Park Dr., Parma 34, Ohio
VICTOR R. BOSWELL, 98 Ridge Rd., Greenbelt, Md. 20770
CHUCK BROADHURST, 3818 El Ricon Way, Sacramento, Cal. 95825
GENE MENEGHINI, 1214 E. 169th St., Cleveland, O. 44110
ELBERT MINTER, 2317 Calumet Ave., NE, Decatur, Ga. 35601
CHARLES PETREVAN, 257 Ridgeroad Rd., Rochester, N.Y. 14626
RICHARD F. SCHENZ, 5010 Hillridge Way, Fair Oaks, Cal. 95628
ALAN SZABO, 6499 Duval Rd., Mayfield Hts., O. 44124
DON TEEPLES, 6207 Forest Mill Lane, Laurel, Md. 20810
LEE WEBSTER, 1000 Sycamore, Manchester, Tenn. 37355

Family Memberships

BRIAN WEBSTER, 1000 Sycamore, Manchester, Tenn. 37355

Special Action Committee

In recent months, comments by NIMAS members indicated a need for material to help beginners (mostly Juniors) to get started in indoor flying. An action committee has been formed to address this problem. Possible products of this committee could take the form of group projects, new models and designs of graded skills, an instruction booklet, or combinations of these.

The committee needs help of all kinds - ideas, plans (drafting of plans), art work, photos, printing and/or duplication - you name it! If you can help, drop a note telling what you can do to: Roger Schroeder, 4111 W. 98th St., Overland Park, Kan. 66207 or Box 545, Richardson, Texas 75080.

Extra NIMAS Services

Those who have joined NIMAS in the past couple of years have received a sheet listing NIMAS services - NIMAS AWARDS and Certificates, free dacron, indoor films, etc. To the list you can add prop design charts (designed by the Velocity Focusing method outlined in March and May '68 INAV's), layout sheets for VF prop design, and calculation sheets for stability margin calculation (see Jan. 1969 INAV for details of stability margin). If you are interested, drop a line to Box 545, Richardson, Tex. 75080.

Dick Black Memorials

The Dick Black Memorial lectures have been started on their rounds - please make reservations early. Individual fliers are requested to return the lectures after two days if possible; clubs and groups are allowed five days and a reasonable effort will be made to bracket club meeting times. The only cost is to reimburse NIMAS for the postage costs incurred.

Meanwhile, many color slides are needed for future Memorial series; if you have proper equipment, please shoot sequential slides on any of the following topics:

1. Covering and patching with microfilm and paper.
2. Bending and installing hardware on models.
3. Construction techniques - building framework, rolling tissue sockets, rolling tubes and booms, model assembly and balance, wire bracing, etc.
4. Model packaging for storage and transport.
5. Prop construction and prop jig construction.
6. Rubber stripping and methods of winding motors on and off the model; use of torque meters.

NIMAS Awards

Silver Cat. I HLG Award - 0:29.0, Tom Peadon

Gold Cat. I HLG Award - 0:34.5, Tom Peadon

Diamond Cat. I HLG Award - 0:36.1, Tom Peadon

NIMAS Aces

Tom Peadon is the latest NIMAS Ace, based on the times shown above. He is the fifteenth NIMAS member to attain Ace, but only the fifth HLG Ace.

More Steering Poles!

After the announcement last month about telescoping fiberglass fishing poles (they are excellent FAI steering poles) available from Sears, Roebuck & Co., Tom Vallee noted that these are available in 12', 16' and 20' length, with prices from $6.88 to $9.88.

Rubber Winder?

Elbert Minter (new member this month) saw a winder at the Nats that he liked - can anyone give him information on how to get one? It was yellow plastic with crank on the side and winding hook coming out one end. Help!

Contest Results?

Many of you have sent in results from contests that had been announced in Contest Calendar. Please don't stop sending in this material - I try to find room for it, but it sometimes gets crowded out. Also, if those readers who really like contest results in INAV will drop a line, this will help me set space priorities. I can't give you what you like without knowing what it is!

Indoor Scale Sheet

Bill Hannan, P. O. Box 1596, Escondido, Cal. 92025 has excellent indoor scale instruction sheets, covering trim, balance and flying hints. He has offered a special price to NIMAS members - only 25¢. It is a good buy!

FAI Benefit Meet

The Dallas/Ft. Worth/Denton FAI Benefit meet raised $12 for the Inboard Travel Fund. This really is an effective way to raise the money - let's get with it! Any award system is OK, but the NIMAS trophies detailed in Jan. '69 INAV were well received.

FAI INDOOR REPORT

Qualification Trial Results

TULSA GLUE DOBBERS LOCAL TRIALS - Jan. 11, 1969
Four qualifiers:

Bobby Dunham	10:04	8:35	18:39
Jim Gardner	8:02	10:09	18:11
Bob Dunham	8:25	9:23	17:48
Bobby Hanford	6:42	7:21	14:03

Team Selection Trials Schedule

CALIFORNIA - San Francisco. FAI Local, Mar. 1-2, 1969, Cow Palace. Bud Romak, 85 Sullivan Dr., Moraga, Cal. 94556. Flying session Feb. 9, 1969 beginning 10 am.

MISSOURI - St. Louis. FAI Local, Feb. 23, 1969, East St. Louis Armory (Cat. I). Dick Hardcastle, 7319 Wise Ave. St. Louis, Mo. 63117, ph. YO 6-0027.

TEXAS - Houston. FAI Local, Mar. 16, 1969. Lars Giertz, 11703 N. Willow Circle, Houston, Tex., ph. PA 3-6463.

VIRGINIA - Hampton. FAI Local Mar. 1, April 5-6, 1969. Bob Champine, 360 Abingdon Cir. Hampton, Va. 23369

CONTEST CALENDAR

INDIANA - West Lafayette. Purdue Aeromodelers Indoor Contest; tentative date March 9, 1969, 9 am to 4:30 pm. HLG, Scale, Easy B and Indoor Stick. Bob Fish, c/o Purdue Memorial Union, West Lafayette, Indiana.

KANSAS - Olathe. HLG & Delta Dart contest at Olathe NAS Drill Hall. Feb. 15, 1969, 1 pm to 5 pm. Roger Schroeder 4111 West 98th St., Overland Park, Kan. 66207

MARYLAND - Silver Spring. Indoor sessions at JFK High School, 1901 Randolph Rd., Silver Spring. Feb. 14, 28; Mar. 14, 28; Apr. 18; May 1, 16; June 6, 13 1969. Bill Saunders, 11613 Le Baron Terr., Silver Spring, Md. 20902, ph. 301-593-7196.

MASSACHUSETTS - M.I.T. Indoor contest at MIT Armory, Mar. 15, 1969. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. 01778.

MISSOURI - St. Louis. Indoor session Feb. 9, indoor contest Mar. 9, 1969. Jim Gremel, 8618 Jo Court, Berkeley, Mo. 63134 ph. 524-0884. Indoor contest April 20, 1969, Dave Linstrum, 12411 Leigh Lane, Maryland Hts, Mo. 63042 ph. 314-434-8894. Events both contests: Easy B, Indoor Stick, Scale, HLG.

OKLAHOMA - Tulsa. TGD 2nd Annual Indoor Contest Mar. 9, 1969, 9 am to 5 pm; ANG Hangar. HLG, Easy B, Scale, Paper Stick, Indoor Stick. TGD Annual (AAA meet) will have indoor events, July 4-5, 1969. Bob Hanford, 3838 South 88th E. Ave., Tulsa, Okla. 74145 ph. NA 7-6932.

TENNESSEE - Manchester. Second Annual Airfoiler Indoor Meet, March 16, 1969. Manchester High School Gym, 8 am to 5 pm. Events: HLG, Scale, Paper Stick, Indoor Stick. Lee F. Webster, 1000 Sycamore, Manchester, Tenn. 37355, phone 615-728-3283.

TEXAS - Dallas/Ft Worth/Denton. North Texas Annual Indoor Meet, Feb. 23, 1969 9:30 am to 5:30 pm. Events: HLG Indoor Stick, Easy B (Jr. only), Sub. Jr. HLG. Bud Tenny, Box 545, Richardson, Tex. 75080 ph. 214-235-4035.

TEXAS - Houston. Indoor session Mar. 2, 1969 6 pm to 11 pm. Gene Simpson, 4327 McDermed, Houston, Tex. 77035, ph. PA 3-8413.

WISCONSIN - Milwaukee. Indoor sessions each Thursday 7:30 pm to 9:30 pm at Sherman Social Center, North 51st St. and W. Locust St. Ken Kraemer, 3945 N. 41st St., Milwaukee, Wisc. 53216

NIMAS POSTAL MEET

The 4th Annual NIMAS Postal will be held during Feb. and March, with entries to be postmarked by Mar. 31, 1969.

Events: Easy B, paper covered only, AMA Rules otherwise.

HLG - AMA Rules except two ceiling classes - 18' to 25' and 25' to 35'

Indoor Stick - AMA Rules except use FAI ceiling measure to compute fudge factor.

General Rules: Entry fee 15¢ per event, stamps preferred. Separate events may be flown at different sessions, but all flights for given event must be flown at one session. Please note ceiling height with each entry - it will be used to figure fudge factors, with standard NIMAS fudge factors. Separate class for Juniors in all events, with awards for high placing Seniors. Separate class for Sub-Junior (age 12 and under) in HLG. Entry open to all, no need to be NIMAS member!

POSTAL CONTESTS!

Tom Vallee issued a postal challenge to fliers at the Denton contest on Jan. 25, with these results:

Name	FAI	Paper	Stick
Tom Vallee	13:00 + 17:13 = 30:13	10:46	17:13
Stan Chilton		12:07	15:10
Bud Tenny	9:07 + 9:35 = 18:42	9:35	
Dick Ganslen		8:24	

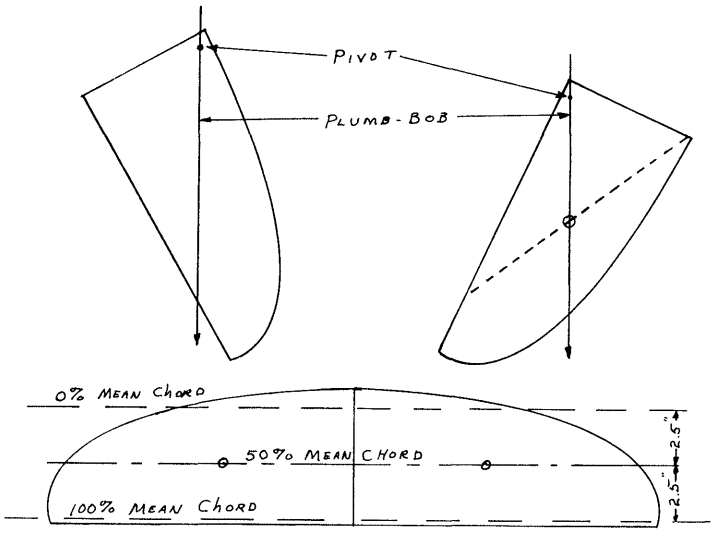
DESIGN FOOTNOTES

Constant Margin of Stability - Follow-Up

A couple of questions have come up about the presentation on stability margin in the Jan. '69 INAV. The graph shown in Fig. 4 is drawn from the computed values of X (distance from nose to CG) and Y (distance from nose to 100% mean chord) for each model design. That is, you make a graph for the given model design and stability margin, then all models built to that design can be balanced from the one graph. By the way, a different stability margin can be recorded on the same graph; it will be a line that is parallel to the first line and displaced to one side.

The matter of mean chord should be explained further, since the example shown was a constant chord wing for simplicity. The method shown below is sufficiently accurate for the purpose and is simple. It will work for any shape of surface, and for assymetrical (offset) wings.

Make a scale drawing of the surface on thin cardboard, cut it out, and cut it in half. Pivot each piece on a pin at two different places and use a plumb-bob and thread to draw a vertical line across the outline. The intersection of the two lines locates the CG of each piece (centroid of the area). If the two pieces are then re-assembled and a line is drawn between the two centroids, this line is 50% of the mean chord. To locate the 0% and 100% lines, compute the mean chord. For the example shown, the root chord is 6" and the span (flat) is 27". Since the outline is a parabolic development, the area is span x root chord x .833 (see Jan '67 INAV or p. 206 in the 1959 Zaic YB). The area is then 134.5 sq. in. and the mean chord (area divided by span) is 5". The 0% and 100% lines can now be drawn in equidistant from the 50% line, and the stability margin graph can be constructed.



STATE OF THE ART

The model of the month is Dick Ganslen's 1967 Great Lakes Paper Stick winner. The winning time of 16:40 has not been exceeded in subsequent meets, in either paper or microfilm events. The model is mostly straightforward in concept and construction, except for the modified prop block and large amount of stick bowing. The last is a tricky technique - hard to master, but often effective.

PIRELLI LORE

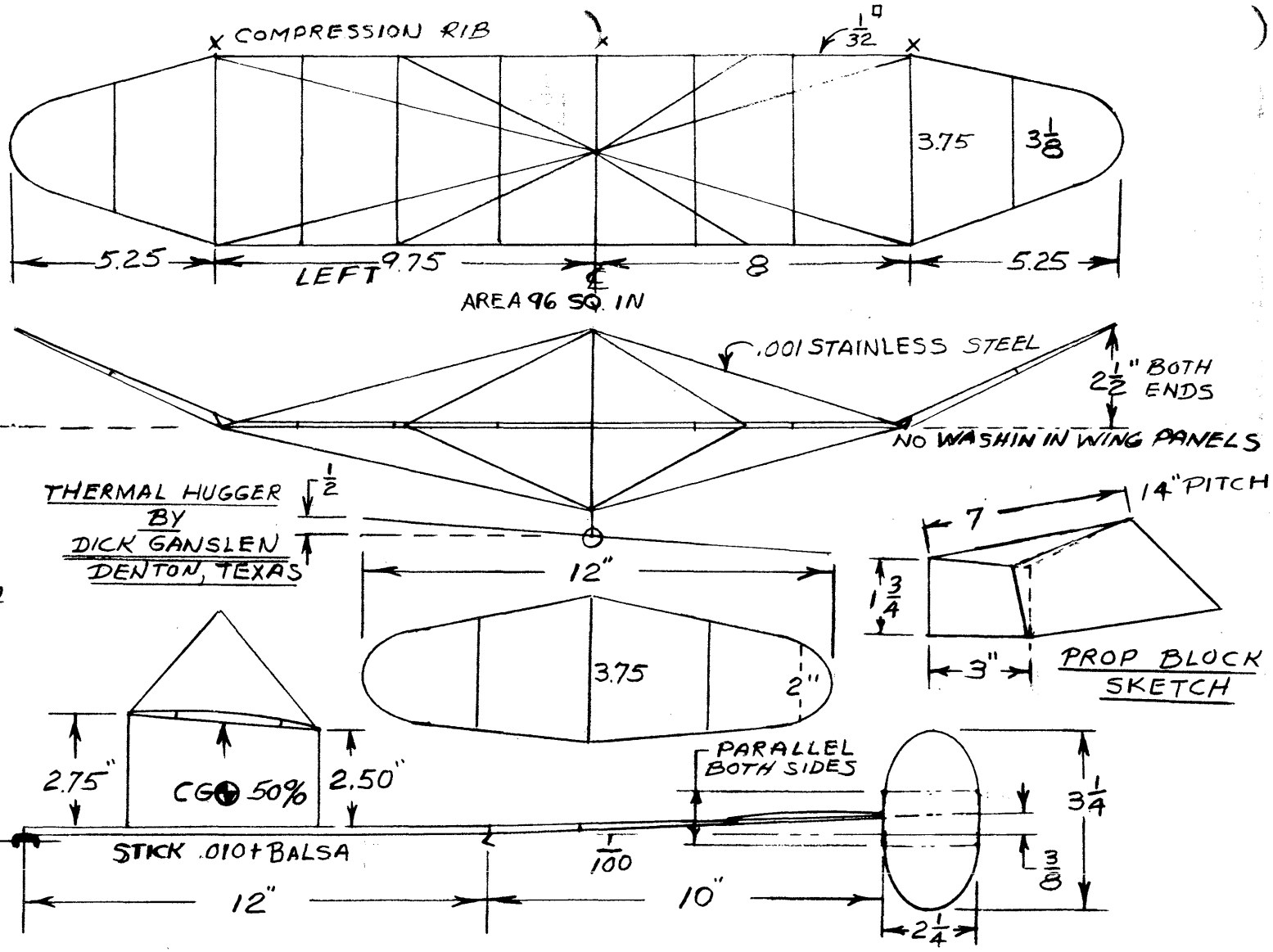
The material presented below is exerpted from a report of his rubber test methods by George Zenakis, noted Wakefield flier and member of both the 1969 Wakefield and Nordic teams. It does not bear directly on pirelli usage for indoor flying, except to determine the ultimate energy release of the rubber. In other words, the actual shape of the torque curve is also a major determining factor in proper rubber usage for indoor, and the energy release is not directly related to the torque curve in any way that we now understand. The report:

To measure the energy output of the rubber, I load all motors to the same value of force per unit of unbroken-in cross section area. This is the same (assuming that all motors are equal weight, as in normal wakefield practice - Ed.) as using a constant value of force times the unbroken-in length. The force is F x l = 150, where F is maximum pull force and l is unbroken-in length in feet. Typically, the maximum force for a ten strand motor is 65 to 75 lbs.

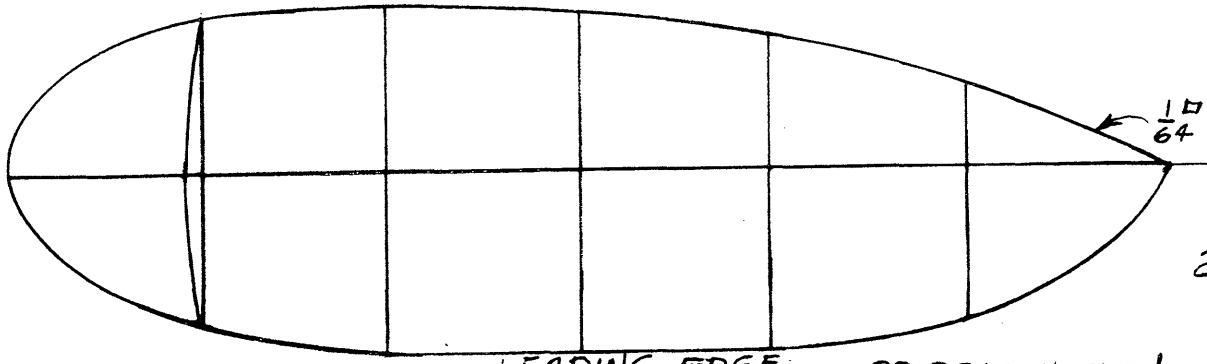
The energy measurement is made by pulling the motor to the required maximum force, then relaxing it slowly. A recording of force vs. elongation is made as the motor is relaxed, with the recording being made on a friction wheel disc integrator. This gadget gives the answer on a three digit counter; this count is proportional to the area under the force vs. elongation curve.

By applying the proper factors for spring constant, integrator wheel size, etc., the three digit count can be converted directly to ft. lbs./lb., and the repeatability of the rig is quite good.

Some results obtained by George: so long as none of a skein of rubber has not been damaged (nicks or cuts, or chemical damage such as exposure to sunlight), the entire skein will test at the same energy regardless of varying cross section. (Remember, testing is on basis of weight.) That is, the rubber quality is uniform throughout.



WING - .0260
STICK - .0120
TAIL + BOOM } .0095
PROP - .0096
TOTAL = .0571



1967 WINNER

14" DIA
26" PITCH

GREAT LAKES INDOOR MEET
PAPER STICK
16 MIN. 40 SECONDS

.070 RUBBER 1940 TURNS
RUBBER WEIGHT .062
STICK FLEXES UNDER FULL TURNS - SUBSTANTIALLY
CEILING 80 FEET

PROP BLOCK CUT 1/4 INCH ON HUB END (SEE SKETCH)

BY E.M.H. 8/30/68

Repeated testing of motors (up to three tests) show no evidence of fatigue, with the same energy release from any motor under repeated tests. No difference is noted between tests conducted right after break-in and those made after several days of rest.

George has found no correlation between energy release and torque output or turns capability. That is, very good rubber can be quite stretchy (high turns capability) or have high torque.

MICROFILM TECHNIQUES

Optimum Pouring Conditions

Past commentary in these pages has referred to the uncertain nature of microfilm pouring - that it was almost a case of "black magic" when you got good results. It has been possible to isolate at least two factors responsible for inconsistent results, and my own pouring sessions have been happier since. These two factors are atmospheric pressure and relative humidity, with atmospheric pressure the most important. For my location, just under 1000 feet altitude, the atmospheric pressure (local pressure, not altimeter setting) needs to be about 29.50 inches of mercury or higher. For that pressure, the relative humidity should be 50% or lower. Tonight, I had beautiful results at 29.73 in. Hg. and 65% R. H.

Atmospheric pressure can be checked by calling the local airport or weather bureau and converting this to your own local pressure if you know what altitude you live at. The correction is approximately .115 in. Hg. per 100 feet of altitude above sea level (subtract .115).

Relative humidity can be checked by the wet bulb-dry bulb method. Get two inexpensive thermometers which read alike and close to the right temperature. Mount both so you can place them in the slipstream of an electric fan, and arrange a wick of soft absorbent cloth over one bulb and dipped in a reservoir of water. The water evaporates and cools the thermometer in proportion to the relative humidity. The chart below is arranged so you can read the difference between the two thermometers and convert this to relative humidity.

TABLE OF RELATIVE HUMIDITY – MEASURING MOISTURE

Difference between wet-bulb and dry-bulb readings	Temperature of air, dry-bulb thermometer, Fahrenheit							
	30°	40°	50°	60°	70°	80°	90°	100°
1	90	92	93	94	95	96	96	97
2	79	84	87	89	90	92	92	93
3	68	76	80	84	86	87	88	90
4	58	68	74	78	81	83	85	86
6	38	52	61	68	72	75	78	80
8	18	37	49	58	64	68	71	71
10		22	37	48	55	61	65	68
12		8	26	39	48	54	59	62
14			16	30	40	47	53	57
16			5	21	33	41	47	51
18				13	26	35	41	47
20				5	19	29	36	42
22					12	23	32	37
24					6	18	26	33

Comparison of readings on the wet-bulb thermometer with those on a dry-bulb thermometer will show relative humidity by using this table. Top figures on the chart are the present dry-bulb reading. By checking the left column for degree difference shown on your two thermometers and across to the dry-bulb reading, you will find the relative humidity.

For instance, if the difference between dry- and wet-bulb thermometers is 6 degrees, and the dry bulb reads 70 degrees, the RH is 72.

A LOOK AT YESTERYEAR

Where Are They?

Ed Franklin, a long-term NIMAS member, asks if some of the East Coast old-timers are still around. For example, those who flew in the New York City Armories back in 1931 and 1932? How about former members of Gimbel's J.A.L.? And those from Stein's Sky Cadets (Ben Shereshaw was leader of this group)? If any of you know of any of these men and their present whereabouts, drop Ed a line at 226 Harrington St., Bergenfield, N. J. 07621.

HINTS AND KINKS

One of the major drawbacks to the prop jig type shown below in Fig, 1 is the difficulty of cutting accurate triangles. No matter how you run the wood grain, you always have one cut across grain that must be accurate. The easy way is to assemble the station from two pieces of 3/32" x 1/2" balsa, as shown in Fig. 2. Except for glue drying time, this method is much quicker; it is far more accurate than cutting wood to the right angle.

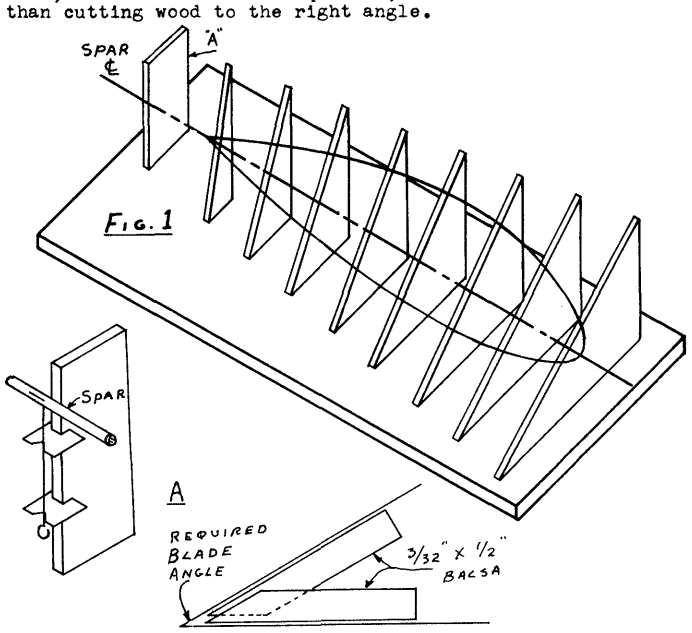


FIG. 1

FIG. 2

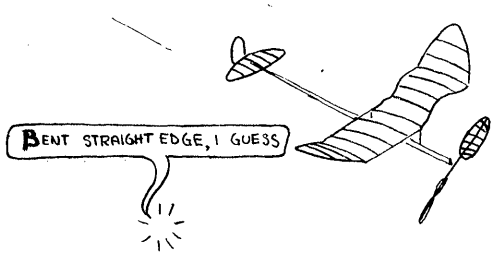
INDOOR ELSEWHERE

Czechoslovakia

My thanks to Dagmar and Eduard Chlubny for this information about Czechoslovakian indoor activity. Indoor flying began in Czechoslovakia in 1950-51 as a winter sport, with a lapse until 1955-56 when it began again. It has been a year-round activity since 1964. At first, times were around 5 to 8 minutes, improving to 11 minutes average in 1964. Eduard set a national record of 16:38 in 1964, with a typical model for that time: outdoor balsa frame, reed motor stick and balsa or human hair bracing. Dagmar's model for Debrecen (1966 W/Ch) was her first with rolled balsa motor stick, as indoor balsa first began to be available.

Prior to Debrecen, indoor information was scarce and limited to early issues of MAN plus sketches of winners from 1961 and 1962 W/Ch. Since Debrecen, INAV has been available, thanks to donations by many NIMAS members.

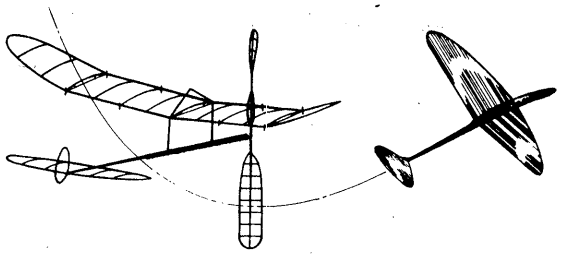
Team selection in Czechoslovakia is done by totalling scores from three national meets. In previous years, all these meets were in the big hall in Brno, and each flier was scored on the basis of the best two scores from the 3 meets. This year, one meet was held in the 12 m site in Ostrava, and the fliers scores based on a percentage of the winning times from each meet. The team for 1969 will be Jiri Kalina, Karol Rybecky and Eduard Chlubny, with Weigert as alternate.



PAT PERCIVAL - INDEPENDENCE, O.

The Voice of N.I.M.A.S. MAR·1969

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

ROGER J. BEHRA, 257 E. 156th St. #302, Cleveland, O. 44110
JOHN M. HOPPER, 23rd & S. Commerce, Russelville, Ark.72801
CARL O. JAEGER, 415 Moore Ave., Miamisburg, O. 45342
DAVE RIGOTTI, 1451 Commonwealth, Cleveland, O. 44124
GORDON WISNIEWSKI, 1801 S. 2nd St., Milwaukee, Wisc. 53204

Family Memberships

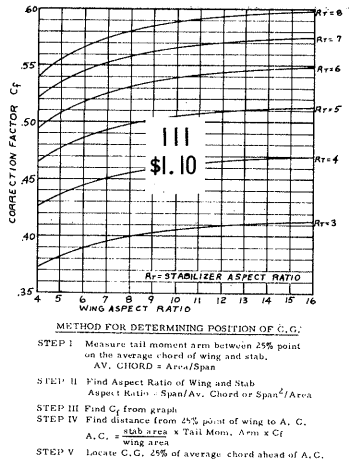
JOE R. MINTER, 2317 Calumet Ave. SE, Decatur, Ala. 35601

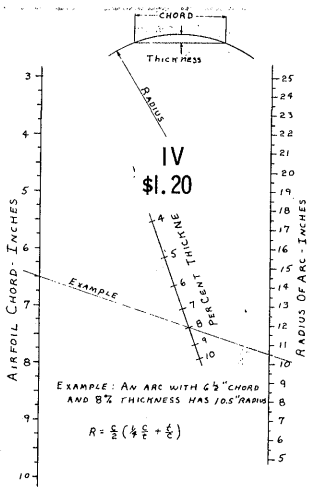
Goofs!

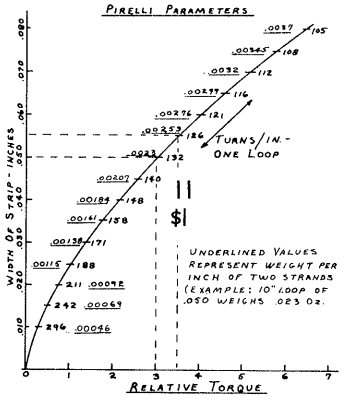
Elbert Minter's address was listed as Decatur, Ga. in the Feb. '64 issue - the address should have been Decatur, Ala. 35601 - a typographical error - and the date would have been 1969 except that the 9 came unglued!

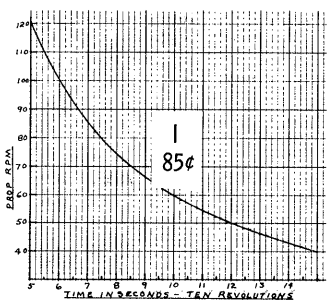
NIMAS Charts

All of the original group of NIMAS Charts have finally been delivered and more are prepared for immediate delivery. The material covered by the charts is reproduced below about 2/3 normal size. Order by the number shown, for the price shown. For those who didn't see the original announcement, the charts are permanent aluminum, suitable for tool box use.









Change of Address!

Ron Ganser asks his friends to note that he has moved to 1745 Brett St., Pittsburgh, Pa. 15205.

Two Day Indoor Nats!

The 1969 Indoor Nats will be held at Lakehurst on July 14 and 15, 1969; Indoor Rubber (paper, mike and cabin) on July 14 and Indoor HLG and Indoor Scale on July 15. When the hangar was found to be available both days, it became possible for Indoor Scale to be made an official event. It should be noted now that this is not likely to be the case often (perhaps never again), and that each event will probably have to support itself in terms of manpower for timing. This likely will take the form of "time a flight, then fly a flight", and will require cooperation from all contestants.

NIMAS Awards

Silver Cat. I HLG Award - 0:29.5, John Thornhill

Silver Cat. I HLG Award - 0:29.0, Don Teeples

Gold Cat. I HLG Award - 0:33.8, John Thornhill

Gold Cat. I HLG Award - 0:35.9, Don Teeples

Gold Cat. I HLG Award - 0:35.6, Dan Belieff

Diamond Cat. I HLG Award - 0:36.8, Don Teeples

Diamond Cat. I HLG Award - 0:39.6, Dan Belieff

NIMAS Aces

As shown above, Don Teeples has qualified as Cat. I HLG Ace with the times given, while Dan Belieff stacked both Gold and Diamond times on top his previous Silver to complete Cat. I Ace and become the third Double Ace in the history of NIMAS.

FAI Benefit Meet

The Brainbusters of Hampton, Va. are the latest club to hold a Benefit Meet to raise money for the Inboard Travel Fund - their March 1 FAI Local raised $4 to help with Team travel expenses. Meanwhile, the Dixie Maxers of the Atlanta area will hold a raffle this month with the proceeds to benefit the Travel Fund. This idea of benefit events is excellent - our past Teams have done very well, both competitively and as good will ambassadors to our friends in Europe. They deserve our strong support, both in spirit and financially.

FAI INDOOR REPORT

Qualifiers Via Contests

Name	Meet/Date	Time/Winning Time	%
STAN CHILTON	Denton/Jan. 25	15:10/15:10	100
JIM CLEM	Denton/Mar. 2	10:38/10:38	100
KRISTI TENNY	Denton/Mar. 2	10:58/6:54	63

Qualification Trial Results

ST. LOUIS LOCAL QUAL. TRIAL (McDonnell FF Club)			
Paul Tryon	10:05	11:03	21:08
Tony Schott	11:14	8:43	19:57
Dave Linstrum	6:38	7:46	14:24
Richard Hardcastle	7:16	6:54	14:10
Nan Tryon	6:35	6:38	
1st BRAINBUSTERS LOCAL QUAL. TRIAL (Hampton, Va.)			
Hal Crane	11:03	12:16	23:19
Bob Platt	10:07	8:40	18:47
Bob Champine	9:06	8:43	17:49
Hewitt Phillips	6:08	8:09	14:17
COW PALACE LOCAL QUAL. TRIALS, San Francisco			
Carl Rambo	19:28	25:52	45:20
Bud Romak	21:49	23:25	45:14
Bob Randolph	22:08	19:07	41:15
Warren Williams	18:12	20:04	38:16
Joe Bilgri	18:20	17:31	35:51
Bill Gibbs	14:42	14:18	29:00

Team Selection Trials Schedule

NEW JERSEY - Irvington. FAI Local, April 15, 1969. Ernie Kopecky, 38 Fawn Lane, Watchung, N. J. 07060.

NEW JERSEY - Lakehurst. The following dates have been set pending Navy approval: April 27, 1969 - FAI Local; May 25, 1969 - Quarter Final; June 29, 1969 - Semi-Final. Chester Wrzos, 184 Oak St., East Orange, N.J. ph. 673-7951.

TEXAS - Dallas/Ft. Worth/Denton. FAI Local, Mar. 22, 1969 Dick Ganslen, 1204 Windsor, Denton, Tex. 817-387-1969. Special note: The floor in the ballroom will be freshly refinished - rubber-soled shoes are a must!

Special Note To CD's

Clarence Mather has requested that all CD's of all FAI Team Selection Trials send him a copy of the results with addresses of the qualifiers, so he may contact them any time it is necessary. His address is 3880 Ecochee Ave., San Diego, Cal. 92117, ph. 273-9396.

In the interests of better communication, will all CD's please send word of planned Qual. Trials to Box 545, Richardson, Texas 75080.

Special Note To Contestants

If there is the slightest doubt of whether there will be a Local Qual. Trials in your area, you should enter the program by sending $3 to AMA HQ to get the program entry forms. You will then be able to qualify at any indoor meet if you fly a model of 65 cm span or less and make at least 60% of the winning time in that event.

CONTEST CALENDAR

ILLINOIS - Chicago. Pete Sotich has announced sessions at the Washington Park Armory in Chicago on Saturday from 9 am to 5 pm. HLG flying is held from 9 am to 12 noon and 4 pm to 5 pm, while indoor rubber is scheduled from noon to 4 pm. This scheduling is contingent upon Nat'l Guard drill schedules; phone the Armory at 312-752-9006 or 312-752-9795 and check before driving to the Armory.

MARYLAND - Silver Spring. Indoor sessions at JFK High School, 1901 Randolph Rd., Silver Spring. Mar. 14, 28; Apr. 18; May 1, 16; June 6, 13, 1969. Bill Saunders,11613 Le Baron Terr., Silver Spring, 20902, ph. 301-593-7196.

MARYLAND - Ft. Meade. Class AA Indoor meet by D.C. Maxecutors and Ft. Meade Modlers, Cat. I (34.5' ceiling). Ft. Meade Field House, 9 am to 5 pm. HLG, Easy B, Indoor Stick, Scale, plus special Sub-Jr event - Delta Dart.

MASSACHUSETTS - M. I. T. Indoor contest at MIT Armory, Mar. 15, 1969. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. 01778.

MISSOURI - St. Louis. Indoor contest Apr. 20, 1969. Dave Linstrum, 12411 Leigh Lane, Maryland Hts., Mo. 63042, ph. 314-434-8894. Easy B, Indoor Stick, Scale, HLG.

NEW JERSEY - Irvington. Indoor sessions at Madison Ave. Elem. School, Mar. 18, 25; Apr. 1, 15, 29; May 6, 13; 17' ceiling. Chester Wrzos, 184 Oak St., East Orange, N. J. 07018, ph. 673-7951.

OKLAHOMA - Tulsa. Record Trials Apr. 12-13, 1969. TGD Annual (AAA Meet) will have indoor events July 4-5, 1969. Bob Hanford, 3838 South 88th E. Ave., Tulsa, Okla. 74145, ph. NA 7-6932

PENNSYLVANIA - Pittsburgh. Invitational Indoor Fun Fly, Mar. 16, 1969, 10:30 am to 4:30 pm, Soldiers & Sailors Hall, Fifth Ave. at Oakland. Easy B, HLG, Delta Dart, Scale. Jim Hanst, Box 421, Valencia, Pa. ph. 443-6064 or Paul Kastory, 132 Bronx Ave., Pittsburgh, Pa. 15229, ph. 761-8730.

PENNSYLVANIA - Pittsburgh. Fifth Annual Indoor Air Meet, April 12-13, 1969. Regular indoor events on Saturday, and the special Junior events on Sunday. Ron Ganser, 1745 Brett St., Pittsburgh, Pa. 15205.

TENNESSEE - Manchester. Second Annual Airfoiler Indoor Meet, Mar. 16, 1969. Manchester High School Gym, 8 am to 5 pm. Events: HLG, Scale, Paper Stick, Indoor Stick. Lee F. Webster, 1000 Sycamore, Manchester, Tenn. 37355, phone 651-728-3283.

WISCONSIN - Milwaukee. Indoor sessions each Thursday in March, 7:30 pm to 9:30 pm at Sherman Social Center, North 51st St. and W. Locust St. Ken Kraemer, 3945 N. 41st St., Milwaukee, Wisc. 53216.

STATE OF THE ART

Part of the uncertainty surrounding the Constant Margin of Stability concept (Jan. '69 INAV) is what margin of stability to use. Richard Ennis made a survey of all the 65 cm models in past INAV's, and the results are tabulated below. Where wing location data was not given, this was scaled from the plan. Since the concept is based on info computed for outdoor models, the graph (NIMAS Chart III) gives coefficients that result in negative values of margin stability for some of the models listed.

Model	Issue	CG Location	% Margin
Goldilox III	Jan. '69	100%	+1.14
Goldilox II	Jan. '69	100%	-7.23
1968 Kalina	Dec. '68	50%	+17.6
Richmond'68 Nats	Nov. '68	80%	-5.4%
Kmoch W/Ch.	Nov. '68	70%	-9.78
1968 Andras Ree	Nov. '68	70%	+6.38
Top Cat III	Sept. '68	Note 1	
Crane 654	June '68	75%	+9.0
Lerman 65 cm	Apr. '68	75%	-5.09
Chlubny	Feb. '68	65%	+5.0
Goldilox	Dec. '67	50%	+25.8
Rohrbaugh	Nov. '67	50%	+6.13
Bastard Mk. II	Oct. '67	90%	-17.5
1967 Andras Ree	Oct. '67	70%	+10.04
Otto Hints	Oct. '67	80%	-5.6
1967 Mather	Sept. '67	65%	+17.4
1967 Richmond	July '67	80%	+3.0
Phillips "B"	May '67	96.4%	+19.7

Note 1 - The plans had no CG location shown. Computations were made for 80% and 90% CG locations; the margins were +9% and -2.35% respectively.

Two models grace the plan page this month - Bob Randolph's Cat. II A ROG and Dick Mathis' "Ear Spear" HLG. Full size plans are available for both models upon request accompanied by stamped self-addressed envelope.

Bob's A record was set during the practice session for the 1968 Great Lakes meet, and the mark stood until late in June when Joe Hindes beat the mark at a session CD'd by Bob. Talk about mixed feelings!

Dick's glider was an early forerunner of the glider he set the Cat. I mark with late in 1968. He won first place with it at the 1st Glue Dobbers Indoor Annual in 1968. In that meet the glider started with a flat airfoil and was slightly heavy for the ceiling. He warped in the drooping airfoil and gained enough on sink rate to win.

RECORDS? MAYBE!

FAI BENEFIT MEET, Jan. 25, 1969, Cat. I, 30' 6" ceiling
Ballroom, Texas Womans Univ., Denton, Texas
Junior Indoor Stick - 11:40, Kristi Tenny

D.C. MAXECUTORS CAT. I RECORD TRIALS, Feb. 18-19, 1969
Hangar #2, Bolling AFB, 34.5' ceiling.
Open HLG - 1:18.8, Dan Belieff
Open Helicopter - 7:14.8, Tom Vallee

BRAINBUSTERS FAI LOCAL, March 1, 1969, Cat. I
Willis School, Hampton, Va. 20' 6" ceiling
AMA CAT. I FAI - 17:59.4, Hal Crane
FAI CAT. I FAI - 18:27, Bob Champine

COW PALACE FAI LOCAL, Mar. 1-2, 1969, AMA Cat. II,
Cow Palace, San Francisco, Cal. 99' 6" FAI Cat. IV
Senior AMA Cat. II FAI - 14:42, Bill Gibbs

NIMAS POSTAL MEET

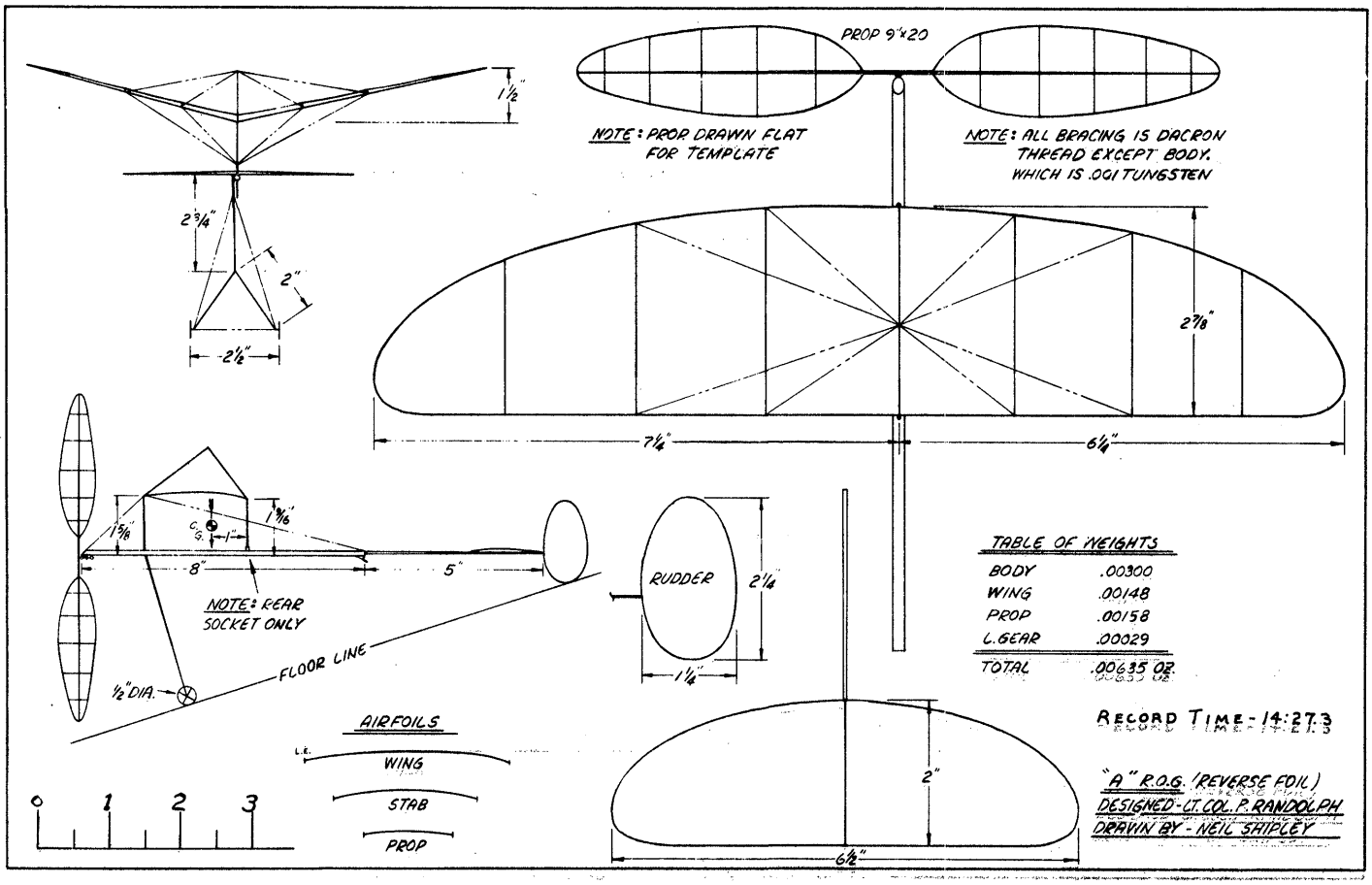
The 4th Annual NIMAS Postal ends this month, with entries to be postmarked by Mar. 31, 1969. Send entries to Bob Putman, 507 Darlene, Arlington, Tex. 76012, along with 15¢ (stamps preferred) per entrant.

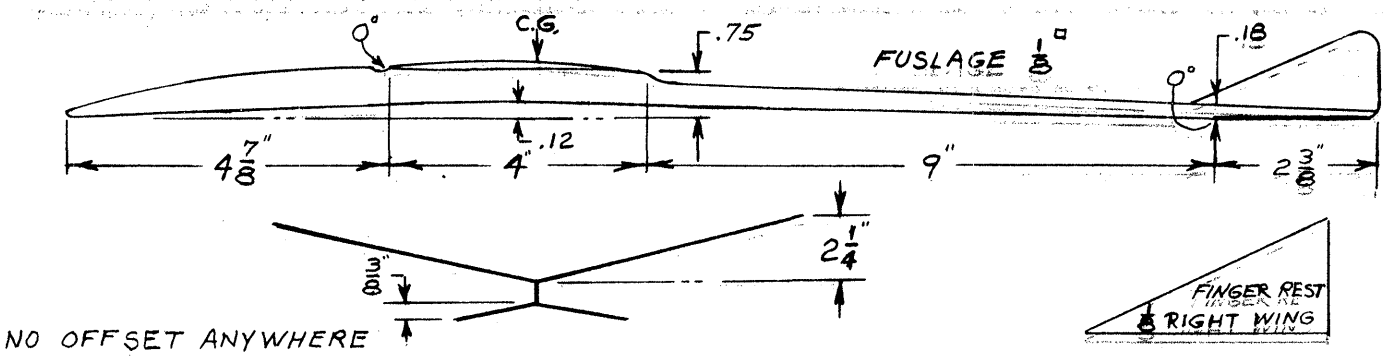
Events: Easy B, paper covered only, AMA Rules otherwise.

HLG - AMA Rules except two ceiling classes - 18' to 25' and 25' to 35'

Indoor Stick - AMA Rules except use FAI ceiling measure to compute fudge factor.

General Rules: Entry fee 15¢ per event, stamps preferred. Separate events may be flown at different sessions, but all flights for given event must be flown at one session. Please note ceiling height with each entry - it will be used to figure fudge factors, with standard NIMAS fudge factors. Separate class for Juniors in all events, with awards for high placing Seniors. Separate class for Sub-Junior (age 12 and under) in HLG. Entry open to all, no need to be NIMAS member!



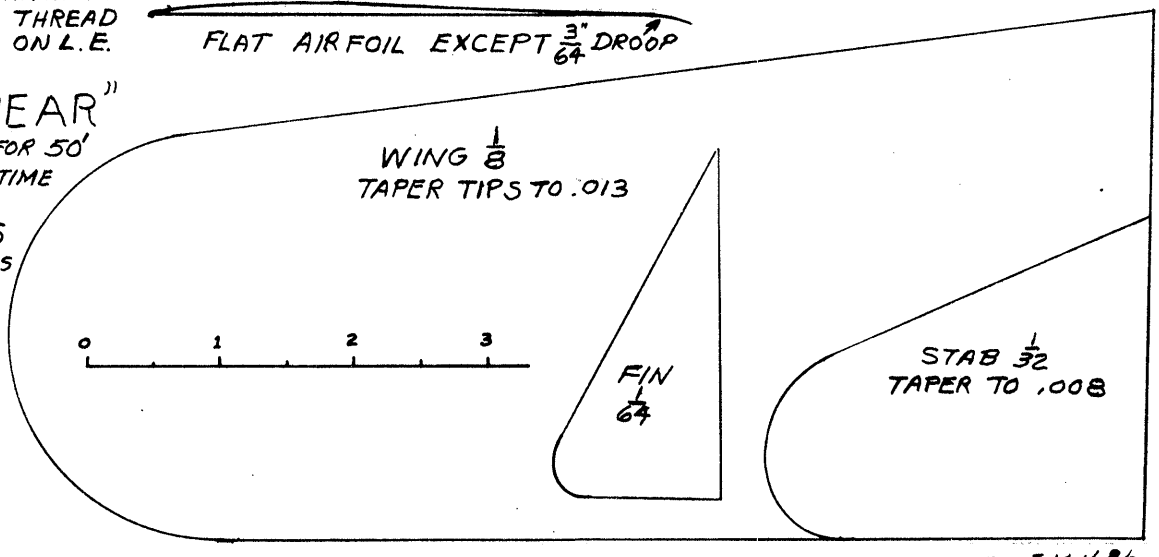


NO OFFSET ANYWHERE
LEFT-LEFT PATTERN
WITH RUDDER AND
LEFT WING WASH-IN
THREAD
ON L.E.

ALL BALSA "C" GRAIN

FLAT AIR FOIL EXCEPT 3/64 DROOP

"EAR SPEAR"
INDOOR HLG FOR 50' CEILING BEST TIME 50.2 SEC.
BY: D. MATHIS
DALLAS, TEXAS



BY E.M.H. 8/30/68

MICROFILM TECHNIQUES - FOLLOW-UP

The "Optimum Pouring Conditions" discussion (Feb. 69 INAV) detailed tentative limits for both relative humidity and atmospheric pressure which encourage good results in pouring microfilm. It should have been stressed that such limits serve me well at approximately 700 feet altitude above sea level. I would very much like to have comments from others at other altitudes, in order to collect a more complete amount of information on the subject.

Meanwhile, a question was asked about correcting altimiter setting to local pressure. To explain further, a call to the weather bureau yields a number such as 30.21 inches of mercury (abbreviated in. Hg.). This number is used by pilots to adjust their altimeter so it will read altitude above sea level. As stated before, the correction is approximately .115 in. Hg. per 100 feet of altitude. For altitudes above sea level, the pressure is less and this correction is subtracted. For 700 feet above sea level, the correction is 7 x .115 or .805 in. Hg. For the example above, 30.21 - .805 = 29.405. I would not try to pour, since the lower limit here is about 29.50. It is possible that a change in solvent balance of the microfilm solution would improve pouring at other pressures, but I don't have time to find out now!

HINTS AND KINKS

Glider Sanding Jig

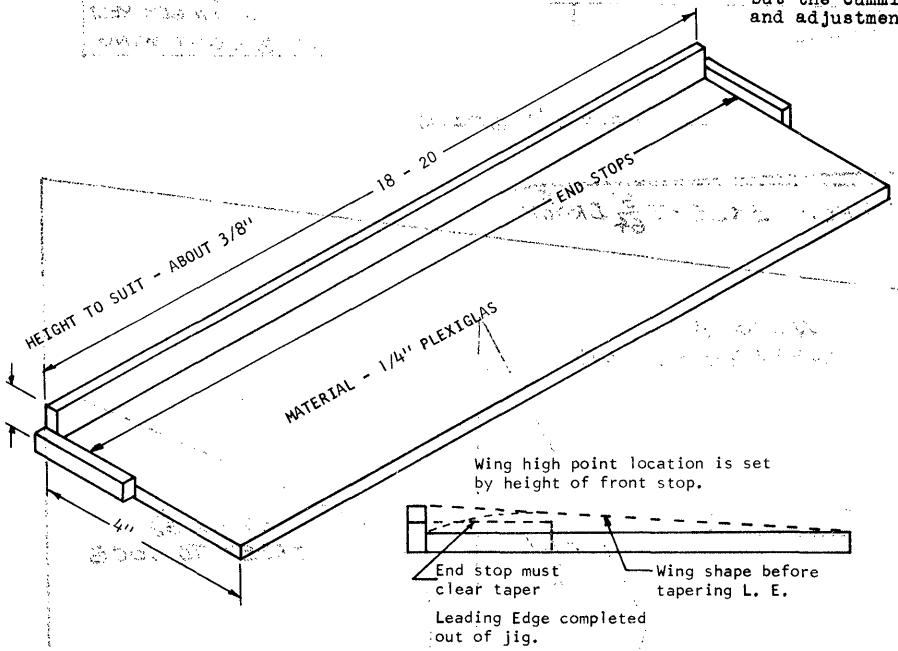
The sketch below details a sanding jig for HLG wings which was built by Bob Dunham from a design by fellow Glue Dobber John English. John's jig was made from wood, but Bob found plexiglas to be an improvement. The jig is for wings with straight trailing edge like the Sweepette, and makes it simple to produce an even airfoil by allowing the sanding block to ride on the edges of the jig.

The end stops keep the wing tight from end to end, and a shorter wing is wedged in place by removable fillers. Different wing thicknesses can be accomodated by shimming from the bottom, but care must be used to avoid sanding the trailing edge too thin. The wing leading edge can be finished easily and quickly after removing the blank from the jig.

An excellent sanding block for use anywhere is made by using contact cement to hold the sandpaper on 3" x 6" plexiglas. This makes a rigid and perfectly flat sanding block; two such blocks with a different grade of sandpaper on each face gives all grits needed to finish a wing.

End Lube Mess!

Wayne Zink suggests that rubber lube can be kept in a 15 cc nasal mist spray bottle (Dristan). All you need to do is remove the siphon tube and wash the bottle, and you have a handy dispenser for rubber lube. Be sure to mark the contents on the outside - this is a must for any drug container used for another purpose!



DICK BLACK MEMORIALS

The two Dick Black Memorial lectures have been on the go constantly since they were announced, and have been well received. As a reminder, clubs or individuals may use them, and the only cost is to refund the postage cost. Please keep them a minimum of time so others may use them also. Each one runs about 8½ minutes and requires a 35 mm slide projector and a tape recorder capable of playing at 3 3/4 inches/sec. #1 covers microfilm techniques and #2 balsa wood selection and cutting.

POSTAL CONTESTS!

The D. C. Maxecutors flew a record trials at Bolling AFB (34.5' ceiling) and challenged entrants at the Denton contest (30.5') to a postal contest. The results:

Flier	Site/Ceiling	Fudge	Time	Score
Paper Stick				
Bob Randolph	Bolling/34.5	1.0	11:51	11:51
Bob Wilder	Denton/30.5	1.06	8:33	9:03.8
HLG				
Dan Belieff	Bolling/34.5	1.0	1:16.3	1:16.3
Don Teeples	"	1.0	1:12.9	1:12.9
Dick Mathis	Denton/30.5	1.13	1:03.4	1:11.6
Tom Peadon	"	1.13	1:03.3	1:11.5
John Sites	Bolling/34.5	1.0	1:08.4	1:08.4
John Thornhill	"	1.0	1:03.3	1:03.3
Bud Tenny	Denton/30.5	1.13	0:52.6	0:59.4

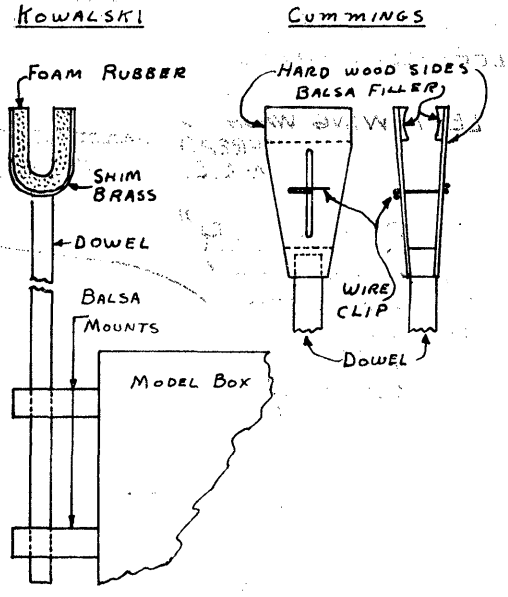
C.M.O.S. - AGAIN

The constant margin of stability discussion (Jan. & Feb. '69 INAV) is based on an article by Hank Cole in Dec. '47 Air Trails. Hank used the term "aerodynamic center", which is customarily (in full scale aero work) used to define factors of the airfoil. Apparently Hank used the term in the context of "aerodynamic center of the model", which should not be too confusing.

Several people have questioned the importance of the CMOS concept, preferring to stick with locating the CG at some arbitrary location such as 70% of the root chord. If you get down to cases, Goldilox III (Jan. '69 INAV) has a 100% CG and +1.14% margin of stability, while Harry Lerman's FAI (Apr. '68 INAV, labelled Mar. '68) has a 75% CG and -5.09% stability margin. How many times have you designed a new model, only to have to move the wing after test flying? My personal record is about 9 out of 10 - so I'm delighted to be able to locate the wing correctly the first time on new models!

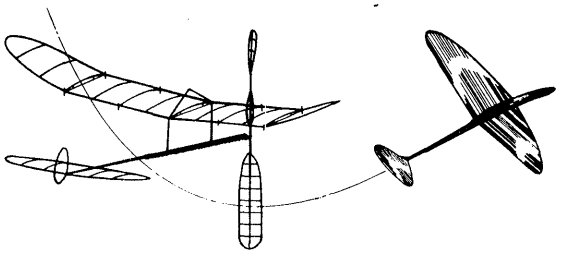
RUN-DOWN STANDS

One of the handiest things on the flying field is a place to "hang" your model while the motor runs down or while you repair or adjust it. The best two I've seen are reproduced below, reprinted from an early INAV. Both stands work well; Kowalski's design is easiest to make, but the Cummings design probably holds better for repair and adjustment.



The Voice of N.I.M.A.S. APR·1969

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

RON ETTELDORF, 1405 Elder St., Waukesha, Wisc. 53186
STEPHEN J. FAUBLE, 801½ 5th Ave., Mendota. Ill. 61342
JOHN A. HATCH, RD#2, Box 58, Rhinebeck, N. Y. 12572
JOHN W. HILLEGAS, 7804 St. Clair, Cleveland, O. 44103
DAVID A. JENCKS, 11 Revere St., Lexington, Mass. 02173
ED LORENZ, 69 Colburn Dr., Poughkeepsie, N. Y. 12603
TERRY THORKILDSEN, 3101 W. Willow Ave., Phoenix, Ariz. 85029

Special Action Committee

The Special Action Committee is evolving a plan of action to help Juniors learn indoor; the main thrust of the action will be personal contact. Model plans, jigs, and sources of material will be made available to all who would serve as instructors, and some special beginner kits will be designed.

The above program will adequately serve beginners who live near NIMAS members willing to serve as instructors, but what about those who don't? It is possible for an experienced builder to guide beginners by mail (I speak from experience, as some INAV readers know), so how about some volunteers? Send your name and address to Roger Schroeder, 4111 West 98th St., Overland Park, Kan. 66207 or to Box 545 Richardson, Texas 75080.

Help Wanted!

Enough printed material now exists to produce special pamphlets on prop design and consatruction, model design, construction techniques, and other topics. Help is needed in arranging this material, editing it in some cases, and pasting it up to serve as masters for multilith printing.

The completed masters could be printed in small lots if someone has access to multilith and would do it for the cost of materials. The alternative is $4 per page in 100 unit lots if they are printed commercially. This is a substantial investment - out of reach for the NIMAS budget at this time.

Finally, more help is needed with the Dick Black memorial series. If you are building a prop, or a wing, or doing some other indoor building, take a series of color slides showing the step-by-step action and send them in to be combined with other slides to make up another of these popular lectures.

NIMAS Honorees

It has been suggested that there is a need for another type of NIMAS honor besides the NIMAS Awards. Do you know a NIMAS member who seems to spark indoor activity wherever he is? Someone who always seems to be able to locate sites and activate them? We have this type, and we all benefit from their efforts. How about some suggestions on what form the honor should take, some tentative standards to guide those who would nominate people for the honor, and suggestions for a name to call the honor?

Bargain Corner

Stan Chilton let us know of a special sale of Dial Thickness Gages by A.O.K. Tool Corporation, 82-21 Sutter Ave., Ozone-Park, N. Y. 11417. Their model SI-112 sells for $9.90 in their 3rd Anniversary Sale, and measures up to .400" by .001" increments. This type of gage is "the" way to measure balsa, rubber, and other indoor stuff. Be sure to mention the anniversary sale when you order!

Pirelli Report

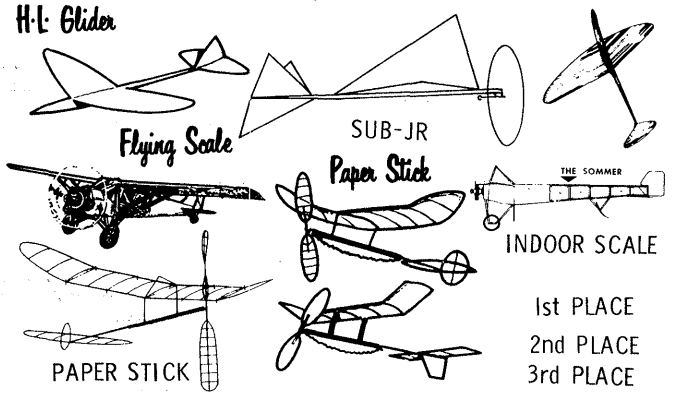
Several of the special tests for PIRELLI LORE have been completed, and the data will be sent out to volunteer workers who will reduce the data and plot it. If you are anxious to see the results, so are we!

NIMAS Awards

Silver Cat. II HLG Award - 0:49.2, Edgar Franklin

Trophy Plates Take Time!

Although it has not been widely publicized, NIMAS has a trophy plate service - provided you plan ahead. Numerous "standard" designs are available, and sheets of art work such as the types shown below are available for you to paste up and arrange to suit your needs. Write to Box 545, Richardson, Texas 75080 for more information; but be sure to allow over a month to be sure there is time to set up and produce the plates you will need.



FAI INDOOR REPORT

Special Note To CD's

Clarence Mather has requested that all CD's of all FAI Team Selection Trials send him a copy of the results with addresses of the qualifiers, so he can contact them if necessary. His address is 3880 Ecochee Ave., San Diego, Cal. 92117.

In the interests of better communication, will all CD's please send word of planned Qual. Trials to Box 545, Richardson, Texas 75080.

Special Note To Contestants

If there is the slightest doubt of whether there will be a Local Qual. Trials near you, you should enter the program by sending $3 to AMA HQ to get the program entry forms. You will then be able to qualify at any indoor meet if you fly a model of 65 cm span or less and make at least 60% of the winning time in that event. Note CONTEST CALENDAR for this month, since this will be your last opportunity. Qualification must be completed by April 30, 1969, whether you qualify at a Trials or an indoor meet.

Team Selection Trials Schedule

ILLINOIS - Chicago. FAI Local, April 12, 1969, Washington Park Armory, 5200 Cottage Grove Ave., Chicago. Pete Sotich, 3851 West 62nd Place, Chicago 60629, RE 5-1353 Site is active Armory, so call PL 2-9006 or PL 2-9795 before leaving home to be sure event has not been cancelled by extra drill session.

MICHIGAN - Detroit. FAI Local, April 13, 1969, Michigan State Fair Coliseum. Paul Crowley, 32604 Tecla, Warren, Mich. 48093, ph. 313-294-0266

MICHIGAN - Detroit. FAI Quarter Finals, May 10, 1969, Michigan State Fair Coliseum. Ed Stoll, 30471 Manse, Mt. Clemens, Mich. 48043.

NEW JERSEY, Irvington. FAI Local, April 15, 1969, Ernie Kopecky, 38 Fawn Lane, Watchung, N. J. 07060.

NEW JERSEY - Lakehurst. The following dates have been set pending Navy approval: April 27 - FAI Local, May 25 - Quarter Final, June 29, 1969 - Semi-Final. Chester Wrzos, 184 Oak St., E. Orange, N. J. ph. 673-7951

OKLAHOMA - Tulsa. FAI Quarter Final, May 10-11, 1969, Bob Hanford, 3838 South 88th E. Ave., Tulsa, Okla. 74145, ph. NA 7-6932.

VIRGINIA - Hampton. FAI Quarter Final may be held at Willis School, Apr. 26-27, 1969. Bob Champine, 360 Abingdon Circle, Hampton, Va. 23369

Qualification Trial Results

DALLAS/FT. WORTH/DENTON LOCAL QUAL. TRIALS, Denton, Texas

Bud Tenny	7:58	5:35	13:33
Dick Ganslen	5:38	7:50	13:28
O. C. Stewart	6:37	5:40	12:17
Richard Powell	4:21	4:06	8:27

POSSIBLE WORLD RECORD

It is reported that Jiri Kalina of Czechoslovakia will apply for a Cat. IV World Record on the basis of his 39:18 flight with a 65 cm model during the International Meet in Romania on Mar. 20-23, 1969. This record is presently listed as 45:40, set with a 90 cm model by K-H Rieke at the 1962 W/Ch. The existing record is certainly an absolute indoor record, but it is hard to predict whether the CIAM will now make a distinction for 65 cm models.

REPORT FROM EUROPE

Mihail Teut of Romania reports that both a Romanian National Championship and an International Contest were held on March 20-23, 1969 - in the large salt mine. Otto Hints set a new Romanian record of 27:42 during the National Champs. The International Contest was attended by five countries - Czechoslovakia, Hungary, Italy, Romania and Yugoslavia. The results:

1.	Hungary	164:09
2.	Czechoslovakia	156:26
3.	Romania	150:56

These times, and particularly Kalina's 39:18 flight which is being submitted for World Record, are unusually good considering that the mine is a constant 60° F.

CONTEST CALENDAR

ILLINOIS - Chicago. Weekly indoor sessions at the Washington Park Armory, contingent upon National Guard drill schedules. HLG 9 am to noon and 4 pm to 5 pm; indoor rubber noon to 4 pm. Call Armory at 312-752-9006 or 321-752-9795 to check drill schedule before leaving home.

MARYLAND - Silver Spring. FAI Benefit meet, Apr. 18-19, 1969. Provisional site arrangements require contestants contact Tom Vallee, 444 Henryton So., Laurel, Md. 20810, in advance. FAI Qual. by voucher, RT, HLG, Indoor Stick.

MARYLAND - Silver Spring. Indoor sessions at JFK High School, Apr. 18, May 1, 16, June 6, 13, 1969. Bill Saunders, 11613 Le Baron Terr., Silver Spring, Md. 20902 ph. 301-593-7196.

MICHIGAN - Detroit. Annual Indoor State Meet, May 3-4, 1969, State Fair Coliseum. Youth events May 3, 10 am to 3 pm; HLG, AMA CUB, PreFab, three age classes. Regular AMA events May 4, 9 am to 3 pm; HLG, Paper Stick, Indoor Stick, Flying Scale. Walter Hartung, 14759 Kilbourne, Detroit, ph. LA 7-7620.

MISSOURI - St. Louis. Indoor contest, Apr. 20, 1969, Dave Linstrum, 12411 Leigh Lane, Maryland Hts., Mo. 63042, ph. 314-434-8894. Easy B, Indoor Stick, Scale, HLG.

NEW JERSEY - Irvington. Indoor sessions at Madison Ave. Elem. School, Apr. 15, 29; May 6, 13. 17' ceiling. Chester Wrzos, 184 Oak St., E. Orange, N. J. ph. 673-7951.

NEW YORK - Hicksville, L. I. Cat. II Indoor meet May 4, 1969, 8 am to 5 pm. Sponsored by LIAMAC, at Cantiague Park Skating Rink, Hicksville, L. I. Site is 50' high, 190' dia. dome. HLG, Easy B, Scale, Paper Stick, Indoor Stick. Bill Dunwoody, 985 Ft. Salonga Rd., Northport, Long Island, N. Y.

OHIO - Cleveland. Cat. I RT, Easy B Contest, May 4, 1969 at Euclid Arena, 22550 Milton Ave., Cleveland. 30' ceiling, 85' x 180' floor. Contest portion for age groups 0-13, 14-16, 16-20, over 20. Dr. Vernon Hacker, 25599 Breckenridge, Euclid, O. 44117, ph. 216-261-4990.

OKLAHOMA - Tulsa. Indoor RT, Apr. 26-27, 1969. Bob Hanford, 3838 South 88th E. Ave., Tulsa, Okla. 910-NA 7-6932.

PENNSYLVANIA - Pittsburgh. 5th Annual Indoor Air Meet, April 12-13, 1969. Regular indoor events Apr. 12, and Junior events Apr. 13. Ron Ganser, 1745 Brett St., Pittsburgh, Pa. 15205.

VIRGINIA - Hampton. Indoor contest and maybe FAI Quarter Finals, Apr. 26-27, 1969. Willis School. Bob Champine, 360 Abingdon Circle, Hampton, Va. 23369

CONTEST RESULTS

TECH MODEL AIRCRAFTERS CLASS AA INDOOR MEET, M.I.T. Armory
Cat. II, 45' ceiling.

Indoor Stick		Open HLG	
1. Harry Lerman	17:35.6	1. Ed Archer	0:59.5
2. Ed Archer	14:06.2	2. Don Richard	0:52.4
3. Jim Daley	12:25.5	3. Jim Daley	0:52.0
4. Sears McCorrison	0:45.0	4. Ron Evans	0:45.5
		5. Sears McCorrison	0:21.5

Delta Dart		Easy B	
1. Mike Daley	0:56.1	1. Ira Lerman	7:01.8
2. Mark Daley	0:50.8	2. Ralph Lerman	6:20.0
3. Mike Roby	0:43.0	3. Mike Daley	3:13.1
4. Dave Tencks	0:36.0		
5. Phill Lawry	0:31.5		

McDONNELL INDOOR MEET, March 9, 1969, E. St. Louis Armory

Delta Dart		Indoor Scale	
1. Ron Weaver	192 sec.	1. Art Biehl	130 pt.
2. Jeff Hardcastle	118.3	2. Jim Richmond	83.4
3. Mike Boyer	114.8	3. Dick Hardcastle	74.7

Open HLG		Junior HLG	
1. Dick Hardcastle	1:08.4	1. Steve Veselsky	0:49.0
2. Paul Tryon	1:01.1	2. Jeff Hardcastle	0:43.5
3. Bob Hotze	0:57.8	3. Rick Ryan	0:33.7

Open Easy B		Junior Easy B	
1. Jim Richmond	14:08.2	1. Craig Hardcastle	3:01
2. Dick Hardcastle	9:58.1	2. Karl Crosby	1:37
3. Tony Schott	7:45.2	3. Mitchell Blum	1:07

Indoor Stick	
1. Carl Jaeger	10:42
2. Paul Tryon	8:54
3. Jim Richmond	8:34

SECOND ANNUAL AIRFOILER CLUB INDOOR MEET, Manchester, Tennessee

Paper Stick		Junior Easy B	
1. Tom Killough	9:25.6	1. Craig Hardcastle	6:26.6
2. Richard Hardcastle	8:41.8	2. Craig Powell	5:32.8
3. Rex Powell	8:01.6	3. Neal Rozelle	4:47.6
4. Walt Rozelle	6:52.6	4. Charles Krickel	4:13.6
5. Lee Webster	5:42.4		

Open Easy B		Indoor Stick	
1. Jim Davidson	9:43.6	1. Richard Hardcastle	16:15.2
2. John Krickel	4:16.0	2. Walt Rozelle	7:02.8
3. Howard Counts	3:22.0	3. Arthur Mansfield	4:46.8
4. Chet Tuthill	3:20.2	4. Jim Davidson	3:30.6
		5. Rex Powell	2:56.5

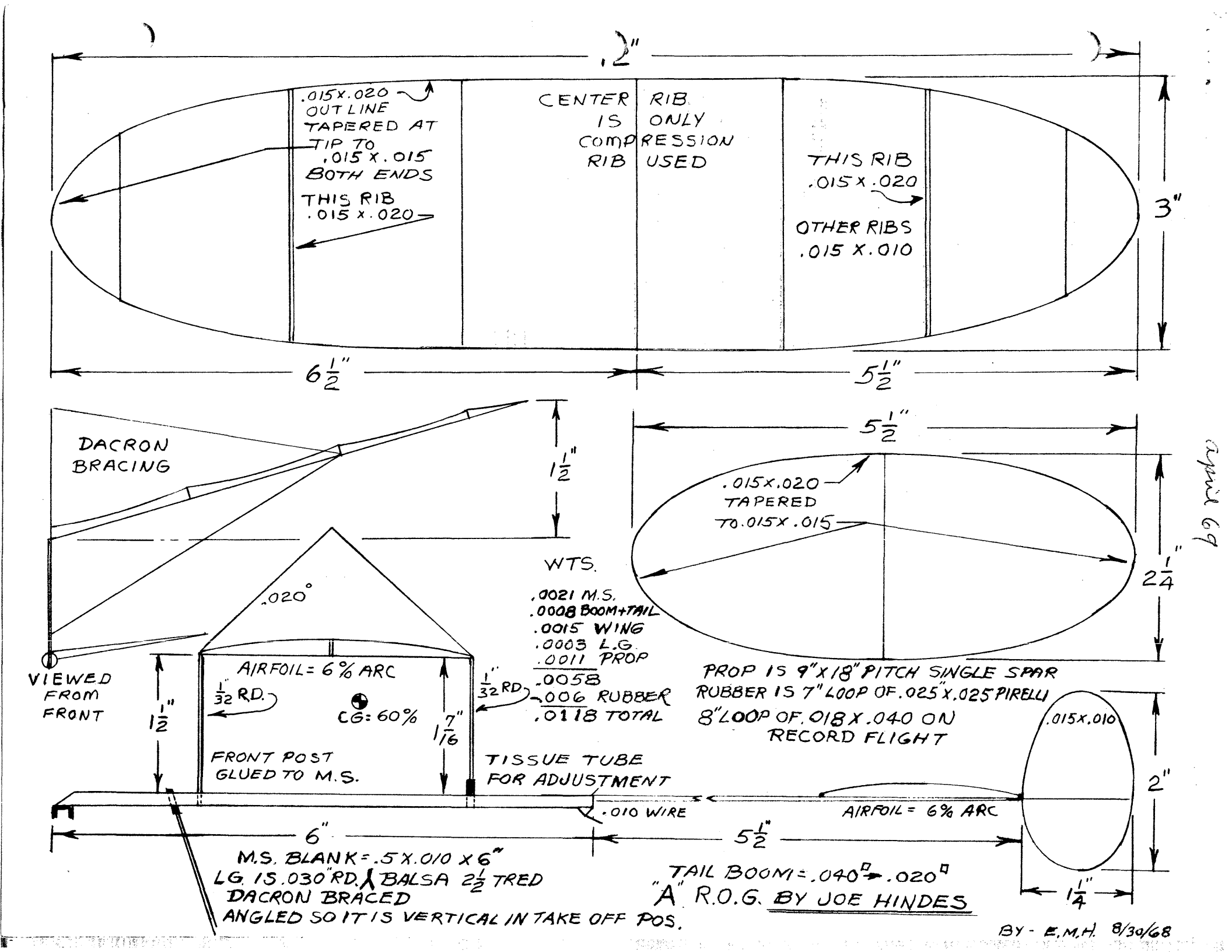
Junior HLG		Open HLG	
1. Steve Farmer	0:53.0	1. Tom Killough	1:05.2
2. Neal Rozelle	0:50.4	2. Dick Hardcastle	1:05.2
3. Jeff Hardcastle	0:47.6	3. Rex Powell	1:04.8
4. Craig Hardcastle	0:44.0	4. Harry Grogan	1:01.6
5. Craig Powell	0:38.6	5. John Cartwright	1:01.2

STATE OF THE ART

This month's model is the current holder of the Cat. II A ROG record at 15:53.2. Joe Hindes set the record at one of the many RT's held by Bob Randolph at Wingfoot Hangar in Ohio - taking the record from Bob. Compare the two models (Randolph's in Mar. '69 INAV) - they are quite similar. Joe said this model was both adequately strong and sufficiently stable to be ballooned easily - you just have to be able to catch it with the balloon!

A LOOK AT YESTERYEAR

Who was the first indoor flier? Hewitt Phillips was recently asked to check the technical accuracy of translations of letters of Alphonse Penaud. Penaud has been credited with being the inventor of the rubber-powered model airplane, and he did most of his aviation experimenting in Paris between 1870 and 1880. One letter to a T. J. Bennett in England said "The airplane which I sent you was demonstrated at a public meeting on the 27th of last November (1873) and made several circuits of the room, which was 19 x 19 meters." Hewitt told much more about Penaud and his models (helicopters, ornithopters and fixed wing pushers), but perhaps this glimpse can be wound up with a quote about making demonstrations with models: "I always tremble when I make an airplane model perform before the public, which, as everyone knows, is always cruel toward failure. Thanks to Heaven that up to now I have been successful in all my attempts."


12"
.015x.020 OUTLINE TAPERED AT TIP TO .015 x .015 BOTH ENDS
THIS RIB .015 x .020
CENTER RIB IS ONLY COMPRESSION RIB USED
THIS RIB .015 x .020
OTHER RIBS .015 x .010
3"
6 1/2"
5 1/2"
DACRON BRACING
1 1/2"
.020°
VIEWED FROM FRONT
1 1/2"
AIRFOIL = 6% ARC
1/32 RD.
CG = 60%
1/32 RD.
1 7/16"
FRONT POST GLUED TO M.S.
TISSUE TUBE FOR ADJUSTMENT
.010 WIRE
6"
5 1/2"
M.S. BLANK = .5 X .010 X 6"
LG. IS .030" RD. BALSA 2 1/2 TRED
DACRON BRACED
ANGLED SO IT IS VERTICAL IN TAKE OFF POS.
WTS.
.0021 M.S.
.0008 BOOM+TAIL
.0015 WING
.0003 L.G.
.0011 PROP
.0058
.006 RUBBER
.0118 TOTAL
5 1/2"
.015x.020 TAPERED TO .015x.015
2 1/4"
PROP IS 9"X18" PITCH SINGLE SPAR
RUBBER IS 7" LOOP OF .025"X.025" PIRELLI
8" LOOP OF .018 X .040 ON RECORD FLIGHT
.015x.010
2"
AIRFOIL = 6% ARC
1 1/4"
TAIL BOOM = .040□ → .020□
"A" R.O.G. BY JOE HINDES
BY - E.M.H. 8/30/68
April 69

THE LAB

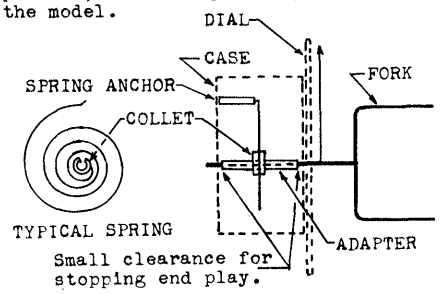
Launch Torque Meter

The Dec. '68 INAV presented a torque meter to be used as a winding stooge and for checking torque curves of rubber motors under test or evaluation. If you use an "O" ring at the torque meter end, that type can be used as a rough check of torque that you launch with. For low ceiling flying, the launch torque determines very closely how high the model will climb. (See "THE LAB", May '68 INAV and "CHOICE OF RUBBER MOTOR FOR LOW CEILING INDOOR", p. 78 of the 1968 NFFS SYMPOSIUM REPORT.)

If you lose any turns hooking up after winding, or wait very long to launch, the torque level will change. Also, it is very difficult to hit a desired launch torque exactly while winding on a torque stooge. The answer to all these objections and problems is to measure the torque just before launch. If you have this capability, it is a simple matter to hook up with a higher torque than needed and let the prop run in short bursts until the torque has dropped to the exact value needed.

A hairspring of suitable strength can be used to make a torque meter to make torque measurements on the model, as shown schematically below. The particular spring used in this torque meter cost $1 postpaid at Addison Aero Parts & Sales, P. O. Box 216, Addison, Texas 75001; order part number 671-73 Hairspring. This spring has a split collet which will need an adapter. Make the adapter to fit the collet, and drill #67 thru the center of the adapter. Press a polished piece of 1/32" music wire thru the adapter to complete the main assembly. The case was made from 1/8" x 1/2" pine strips set on edge and covered with .020" aluminum to form a box. The only bearing necessary is to drill the case sides to fit the 1/32" music wire. Anchor the free end of the spring to the case, and assemble the case to the frame with small screws. Calibrate the unit in the same manner as for the meter in Dec. '68 INAV.

How do you use this device safely? Hold the model by the front wing socket (thumb and index finger of right hand) with the prop spinning free. Engage the fork with the prop shaft, which stops the prop. Read the torque and launch the model.



PIRELLI LORE

The Dec. '68 INAV showed that pirelli improves as it is broken in, both in energy output and number of turns. Bob Platt presented part of this information which showed how much a certain motor improved with successive windups. He later had second thoughts, and made the following comments:

"I thought that the previous tests showed definitely that used rubber was better than new rubber. However, I have decided that energy outputs can't be compared this way because the rubber is being stressed higher and higher with each wind. This is because the increase in length is accompanied by a reduction in cross-section, yet the motor is wound to the same maximum torque.

It finally occurred to me that a better test would be to compare a used (broken in) motor with a new one which was stripped to give the same cross-section area as the old motor. Then, when wound to the same maximum torque we would be comparing motors at the same stress. To improve accuracy I used two new motors and faired a curve through the points to represent new rubber. I also used one broken in motor and wound it twice (with two days of rest between winds) and faired through these points to represent broken-in rubber. The curves represent about 8% increase in energy output per unit weight."

MODEL STORAGE AND TRANSPORTATION

Part I - General Considerations

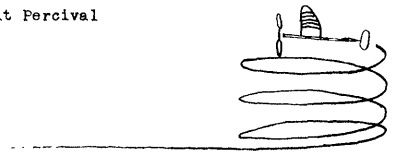
This series is an attempt to answer numerous requests for information about model boxes with comprehensive coverage of the subject. I invite contributions by anyone who has a different way of solving the problems involved with this field.

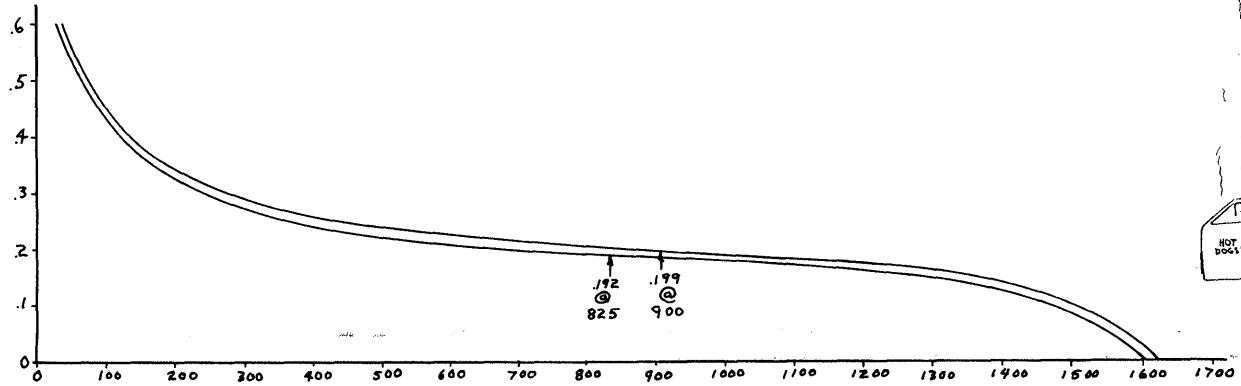
Boxes which house indoor models must be airtight so they can be carried outside safely. They should be constructed so that they can be opened without causing a big inrush of air. The models should not be packed too closely so there is danger of hooking one part on another as you remove the models from the boxes. Everything in the box must be secured so it can't come loose. It is advisable to use sway braces when models are packed closely - particularly if the box will be handled by others besides the owner. Large boxes should definitely have a handle, and a locking device to prevent accidental opening. It is advisable to have the box waterproofed inside and out - not necessarily so it will float but to prevent moisture from being absorbed by the material of the box.

Finish (both color and waterproofing) inside a box is important. If the box is black inside, it is easier to see model components due to the color contrast. It is important that the paint material be thoroughly dry before you use the model box. Otherwise, solvent evaporation from the paint may make the microfilm **droopy**. Note that this is not a reliable way to remove warps due to tight film! The film always recovers within a few minutes after coming out of the box, unless the film is sticky. In that case the slack film sticks to itself and pulls holes or warps the structure after you take it out of the box.

The choice of box type is an individual matter, based on model sizes and types to be carried, how many models must be carried, and general convenience. Many "full house" A ROG models do not come apart (see Randolph's A ROG, Mar. '69 INAV), and cabin models often have the wing integral with the built-up body and landing gear. These models require special boxes and different packing. Someone who flies only FAI size models needs a different box than someone who flies Easy B and paper stick. Another decision involves which model types to group together if you have too many models for one box. This series shows a number of different choices - don't get a headache making the choice!

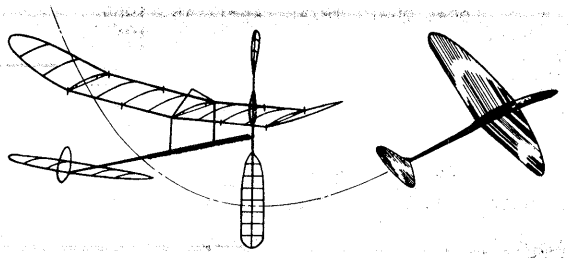
Pat Percival





The Voice of N.I.M.A.S. MAY·1969

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

TERRY BUDDINGH, 1689 Juniper St., Livermore, Cal. 94550
ROBERT D. HABERSTROH, Route 1, Box 466, Ft. Collins, Colo. 80521
MARLIN J. RABUCK, 157 Parkview Rd., Stratford, N. J. 08084

Indoor Nats - PAY ATTENTION!

The March '69 INAV announced that the 1969 Indoor Nats will be held on two days. Indoor Stick, Paper Stick and Indoor Cabin will be held on Monday, July 14, from noon to 8 pm. HLG and Indoor Scale will be held on July 15, from 10 am to 6 pm.

Registration will be held only at Willow Grove NAS, and you must register before flying. Registration opens 8 am, July 14, and continues during the week. This means that indoor rubber contestants must plan to enter Willow Grove NAS (near Philadelphia, Pa.) at 8 am when the base is opened to contestants, register immediately, and then go directly to Lakehurst, New Jersey to fly. Scale and HLG contestants are advised to register on July 14 also.

Elimination of registration at Lakehurst was necessary due to the impossibility of coordinating two separate registration centers, and to help reduce Navy manpower requirements. We have received assurances from AMA HQ and members of the Nats Executive Committee that there is ample time to complete registration and make it to Lakehurst before flying begins. Special registration procedures are being set up, and Pete Sotich has made maps with the fastest route marked available to all who wish them.

Indoor has been growing rapidly this year - let's have a large Nat's entry! Entry blanks are available from AMA HQ. Any requests for entry blanks must be accompanied by a stamped, self-addressed envelope. Use one 6¢ (or 7¢ if rates go up) stamp for each entry blank requested. Note that the deadline for advance Nats entry is June 15, 1969. If you miss that deadline, you must enter in person on July 14, and pay a substantial late entry fee. Either way you must register before you fly!

Indoor Nats Timing

The Indoor Nats will again be staffed entirely by AMA personnel - timing, paperwork - the whole project. It is virtually certain that each flier will have to time as many flights as he makes - time then fly! Juniors will be exempted, of course - so plenty of volunteer timing help will also be needed. Volunteer by sending your name to Box 545, Richardson, Texas 75080. If you can't help for the full eight hours, please note when you can!

NIMAS Awards

SILVER CAT. I HLG AWARD - 0:25.0, Hal Crane

GOLD CAT. I HLG AWARD - 0:35.6, Rex Powell

HLG Plan Offered

Ron Wittman has offered to furnish a plan of "Tara 18" complete with full size outline drawings to any NIMAS member who will furnish a stamped, self-addressed envelope for the return of the plan. Send the envelopes to Box 545 Richardson, Tex. 75080. The plan includes info on the version which holds the Open OHLG record (19:32), and the Cat. II/III version which has won several places in Nats competition. This would be a good model for the 1969 Indoor Nats!

Please Have Patience!

If you have a NIMAS Award, or a NIMAS certificate coming, or if you wrote recently, it may be a while but you will hear from me! This winter has been especially busy; my total preparation for the Team Selection Program to date has been one box, one completed (but untested) model, and two model designs.

Because of the tight scheduling of the Team Selection Program, and the early Nats, the next two or three INAV's will be on a highly variable schedule. Stay cool!

Help Wanted!

It has been suggested that the NIMAS mailing list be broken down to a listing by states; this seems like a most useful thing to have. Will anyone handle the task of sorting the names and assisting in keeping the list up to date?

Competition Newsletter

One of the best ways to stay abreast of what is happening in AMA is to subscribe to the AMA Competition Newsletter. This is part of the new competition service which is offered to AMA members for $3 per year. The newsletter is really outstanding, and content goes beyond AMA doings and covers technical matters.

FAI INDOOR REPORT

Team Selection Trials Schedule

CALIFORNIA - Edwards AFB. FAI Q-F - May 18, 1969. Entrants must contact Bob Randolph, 25145 Lawton Ave., Loma Linda, Cal. 92354 in advance so he can arrange for security clearance.

CALIFORNIA - San Francisco. May 25, 1969 at Cow Palace; FAI Q-F. FAI Semi on June 8, 1969. Joe Bilgri, 1255 Blackfield Dr., Santa Clara, Cal. 95051.

ILLINOIS - Chicago. FAI Q-F on May 4, 1969. Pete Sotich, 3851 W. 62nd Place, Chicago 60629. Call 312-PL 2-9006 or 312-PL 2-9795 (the armory) to check if a special drill has cancelled the session.

MICHIGAN - Detroit. FAI Q-F May 10, 1969 at Michigan State Fair Coliseum. Ed Stoll, 30471 Manse, Mt. Clemens, Mich. 48043.

NEW JERSEY - Lakehurst. FAI Q-F May 25, 1969; FAI Semi on June 29, 1969. Chester Wrzos, 184 Oak St., E. Orange, N. J. 07018 ph. 201-673-7951.

OKLAHOMA - Tulsa. FAI Q-F May 9, 1969, 5 pm to 10 pm. Note! This is a change of date and site! Bob Hanford 3838 South 88th E. Ave., Tulsa, Okla. ph. NA 7-6932.

TEXAS - Dallas. FAI Q-F on May 25, 1969. Dick Ganslen, 1204 Windsor, Denton, Tex. 76201 ph. 817-387-1969.

VIRGINIA - Hampton. FAI Q-F on May 17-18, 1969. Bob Champine, 360 Abingdon Circle, Hampton, Va. 23369

Qualification Trial Results

Qualifiers Via Contests

Name	Meet/Date	Time/Winning Time	%
Bill Hulbert	Pittsburgh/4/12	14:08.5/14:08.5	100
Carl Jaeger	"	13:05/14:08.5	93
Ron Ganser	"	11:47/14:08.5	83
Dale Hacker	"	10:02/14:08.5	71
Lou Willis	"	9:32/14:08.5	67
Dr. Vernon Hacker	"	8:46/14:08.5	62

EDWARDS AFB QUAL. TRIAL (Bob Randolph sponsor)
Robert Gibbs
Paul Allen, Jr.
Linda Randolph
Fudo Takagi

CHICAGO AREA LOCAL QUAL. TRIAL, April 12, 1969 90' ceil.

Erwin Rodemsky	16:04	27:47	43:59
Curtis Janke	19:55	22:12	42:07
Wayne Zink	18:14	16:52	35:06
Charlie Sotich	14:47	15:33	30:20
Wally Mumper	15:19	11:05	26:24

IRVINGTON, N. J. LOCAL QUAL. TRIAL, April 15, 1969

Chester Wrzos	10:41
John Triolo	10:13
C. V. Russo	9:03
Julius Rudy	8:37
Richard Nawoyski	7:52
Emanuel Radoff	6:47

RECORDS? MAYBE!

FAI BENEFIT MEET, Bolling AFB, Apr. 19, 1969 Cat. I
Hangar #2, 34.5' ceiling
Open Paper Stick - 14:01, Bob Randolph
Open Cabin - 12:54.2, Bob Randolph

FAI LOCAL QUAL. TRIAL, April 12, 1969 CAT. II AMA
Washington Park Armory, Chicago, Ill. 90' ceiling
Open Paper Stick - 21:55.6, Jim Richmond
AMA CAT II FAI - 33:20.5, Jim Richmond

HAMPTON INDOOR CONTEST, April 26, 1969 Cat. I
Willis School, 20' 6" ceiling
Open Indoor Stick - 20:02.8, Hal Crane

POSSIBLE WORLD RECORD!

Hal Crane's 20:02.8 flight listed above was not only an unsteered flight, but it also fulfilled all requirements for a World Record. Hal had the foresight to have a World Record sanction in force, so he has filed to claim the record. The existing record is held by Jiri Kalina at 19:20, and Hal had to exceed that by 2% (exceed 19:43.2). If this flight is recognized, the next one will need to exceed 20:25. Hal's model was a 31.5" span "D" which weighed .0445 oz. and used .0415 oz. rubber. This is truly a magnificent achievement!

CONTEST CALENDAR

ILLINOIS - Chicago. Weekly indoor sessions at the Washington Park Armory, contingent upon National Guard drill schedules. HLG 9 am to noon and 4 pm to 5 pm; indoor rubber noon to 4 pm. Call Armory at 312-752-9006 or 321-752-9795 to check drill schedule before leaving home.

MARYLAND - Silver Spring. Indoor sessions at JFK High School, ~~Apr. 18, May 1,~~ 16, June 6, 13, 1969. Bill Saunders, 11613 Le Baron Terr., Silver Spring, Md. 20902 ph. 301-593-7196.

MICHIGAN - Detroit. Annual Indoor State Meet, May 3-4, 1969, State Fair Coliseum. Youth events May 3, 10 am to 3 pm; HLG, AMA CUB, PreFab, three age classes. Regular AMA events May 4, 9 am to 3 pm; HLG, Paper Stick, Indoor Stick, Flying Scale. Walter Hartung, 14759 Kilbourne, Detroit, ph. LA 7-7620.

NEW JERSEY - Irvington. Indoor sessions at Madison Ave. Elem. School, ~~Apr. 15, 29;~~ May 6, 13. 17' ceiling. Chester Wrzos, 184 Oak St., E. Orange, N. J. ph. 673-7951.

NEW YORK - Hicksville, L. I. Cat. II Indoor meet May 4, 1969, 8 am to 5 pm. Sponsored by LIAMAC, at Cantiague Park Skating Rink, Hicksville, L. I. Site is 50' high, 190' dia. dome. HLG, Easy B, Scale, Paper Stick, Indoor Stick. Bill Dunwoody, 985 Ft. Salonga Rd., Northport, Long Island, N. Y.

OHIO - Cleveland. Cat. I RT, Easy B Contest, May 4, 1969 at Euclid Arena, 22550 Milton Ave., Cleveland. 30' ceiling, 85' x 180' floor. Contest portion for age groups 0-13, 14-16, 16-20, over 20. Dr. Vernon Hacker, 25599 Breckenridge, Euclid, O. 44117, ph. 216-261-4990.

GEORGIA - Moultrie. Georgia State Championships at Spence AFB, May 3-4, 1969 (AAA) will have indoor May 3, 7:30 pm to 10:30 pm. Easy B, HLG, Paper Stick. Walt Rozelle, 1403 Midlawn Dr., Decatur, Ga. 30032 ph. 404-284-8110

WISCONSIN - Milwaukee. Indoor sessions 7:30 pm to 9:30 pm, May 8,15,22,29, June 5, 1969 at Sherman Social Center, North 51st. St. and W. Locust St. Ken Kraemer, 3945 N. 41st. St., Milwaukee, Wisc. 53216

INDOOR WORLD CHAMPIONSHIP

Poland has withdrawn their offer to host the 1970 W/Ch because their site will not be finished. Romania has been accepted as alternate host, and the site will be the salt mine where Kalina did 39+ with a 65 cm model. This site is 122 m below ground; 32.5 m wide, 65 m high and 120 m long. Drift is perhaps the lowest of any site in the world, but the temperature is constant at 9° or 10° C. More details and a site sketch next month!

NIMAS POSTAL MEET

Overall entry this year was somewhat bigger than last year, but youth entry was again pretty slim. All times are listed in seconds. The standard rubber fudge factor was used for rubber events (square root of the ceiling height ratio), and for HLG (except Jr.) the ratio of ceiling height was used since this has proved most equitable for small differences in height. The HLG Fudge graph was used for Jr. HLG; this graph appeared in Oct. '66 INAV. All winners will receive NIMAS Certificates, and Junior entrants will receive a copy of the Bilgri reprint and a slide rule. The results:

	Time/ceiling	Fudge	Adj. Time
OPEN EASY B			
1. Clarence Mather	590/30'	1.16	690
2. Joe Pontecorvo	516/24'	1.31	674
3. Pete Patterson	492/24'	1.31	643
4. Jim Walters	392/24'	1.31	525
5. Howard Haupt	384/25'	1.28	492 (1st Senior)
6. Phil Hainer	383/25'	1.28	490
7. Joe Deady	367/24'	1.31	480
8. Rex Powell	395/31'	1.15	454
9. R. J. Dunham	453/41'	1.0	453
10. Fudo Takagi	352/25'	1.28	450
11. John Thornhill	318/30.5'	1.16	369
12. Martin Richardson	278/35'	1.08	301
13. Steve Kokita	169/25'	1.28	216
JUNIOR EASY B			
1. R. J. Dunham II	467/41'	1.0	467
2. Kim Mather	255/25'	1.28	326
3. Neal Rozelle	287/35'	1.08	311
CLASS I OPEN HLG			
1. Jim Walters	60/25'	1.0	60
2. Clarence Mather	59.5/25'	1.0	59.5
3. Nat Antonioli	59/25'	1.0	59
4. John Richards	49.4/25'	1.0	49.4
CLASS II OPEN HLG			
1. Dan Belieff	76.3/34.5'	1.014	77.36
2. Don Teeples	72.9/34.5'	1.014	73.92
3. Dick Mathis	63.4/30.5'	1.15	72.91
4. Tom Peaden	63.3/30.5'	1.15	72.79
5. John Sites	68.4/34.5'	1.014	69.36
6. Bucky Serviates	65.9/35'	1.0	65.9
7. John Thornhill	65.2/34.5'	1.014	66.1
8. Tom Killough	56.3/31'	1.13	63.62
9. Bud Tenny	52.6/30.5'	1.15	60.49
10. Rex Powell	48.7/31'	1.13	56.16
11. Martin Richardson	52.6/35'	1.0	52.6
JUNIOR HLG			
1. R. J. Dunham II	71.5/55'	1.0	71.5
2. Neal Rozelle	26.8/35'	1.40	37.6
SUB-JR. HLG			
1. Jimmy Clem	30.9/30.5	1.0	30.9
2. Kristi Tenny	27.6/30.5	1.0	27.6
INDOOR STICK			
1. Clarence Mather	972/22.3'	1.29	1252
2. R. J. Dunham	807/37'	1.0	807
3. R. J. Dunham II	716/37'	1.0	716 (1st. Jr.)
4. Walter Rozelle	449.9/21'	1.33	600
5. Carl Jaeger	540/35'	1.06	556

STATE OF THE ART

The model of the month is Dan Belieff's "Fluf-Duf" - which currently holds the Cat. I Open HLG record at 1:18.8 and has won or placed at many other meets. It is possible that Dan could tell you where to get full size plans, since this presentation is a blue-line print. Dan Belieff 204 Cedar Lane, Rockville, Md. 20851.

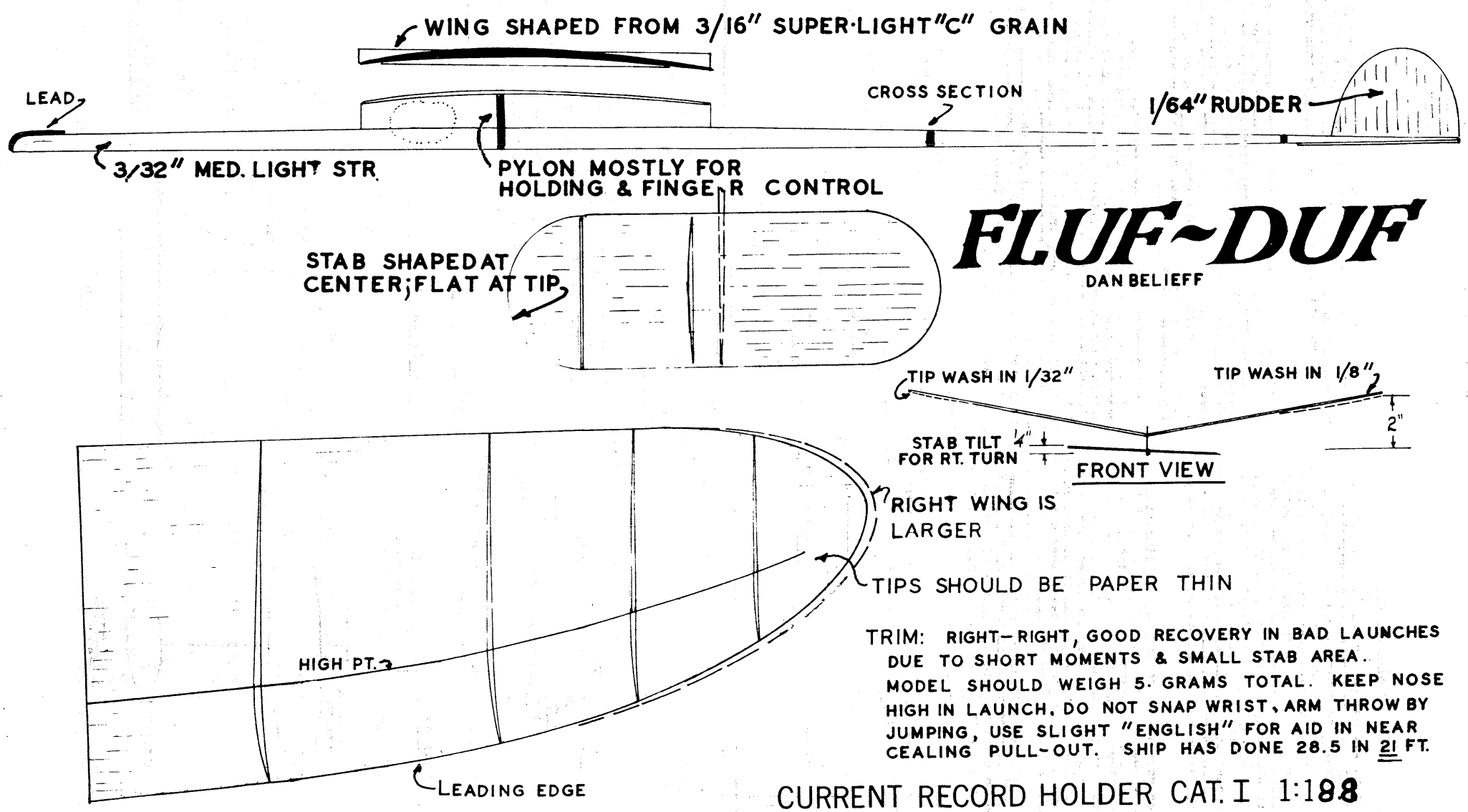
CALIBRATING INDOOR SCALES

The March '64 INAV presented two indoor scales, and noted that weight for calibrating the scales could be made through access to precision laboratory balances. Bob Dunham has called to our attention an article "Direct Reading Indoor Scale" which appeared in the June '60 MAN. This is an interesting article about a different type of scale, but the real meat is in a chart of weights. Plain enamel covered magnet wire, obtainable at electronic supply houses, is made to close tolerances. The following chart gives the weight/inch of several wire sizes:

Wire Gage	Inches/Oz.	Wire Gage	Inches/Oz.
10	28.5875	26	956.25
12	37.41	28	1518.00
14	59.55	30	2415.85
16	94.575	32	3759.00
18	150.60	34	6097.50
20	239.25	36	9665.25
22	380.70	38	15369.0
24	602.25	40	24429.75

As an example of how to make a calibrating weight using the chart above, #34 wire is 6097.5 inches per ounce. A .001 oz. weight would then be 6.0975" long; if you can manage to measure it to just over 6.09" long it will be within .1% of the correct weight. Similarly, 15.06" of #18 wire would be exactly .1 oz.

Use care in making the weights for best accuracy. Be sure you use new, clean, unscratched wire, and get it as straight as possible to measure it. Use a machinist's ruler to measure the wire; file one end of the wire flat for reference and then cut and file the other end to the proper length.



TRIM: RIGHT-RIGHT, GOOD RECOVERY IN BAD LAUNCHES DUE TO SHORT MOMENTS & SMALL STAB AREA. MODEL SHOULD WEIGH 5. GRAMS TOTAL. KEEP NOSE HIGH IN LAUNCH. DO NOT SNAP WRIST, ARM THROW BY JUMPING, USE SLIGHT "ENGLISH" FOR AID IN NEAR CEALING PULL-OUT. SHIP HAS DONE 28.5 IN 21 FT.

CURRENT RECORD HOLDER CAT. I 1:188

BALLOON STEERING - ANOTHER LOOK

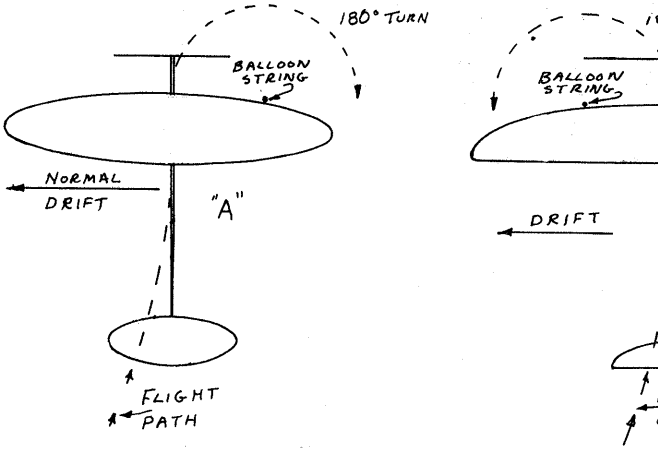
Balloon steering was covered in May '63 and June '65 INAV's. These two articles can be briefly summarized in the following remarks. The basics are simple, and only require practice - the higher the model the more practice becomes important. The most important single thing is to decide when to steer; do not delay in getting the balloon up while you decide. If you safely can do so, put the balloon up if you even suspect you will need it; then you can agonize to your heart's content and you are ready for the decision when it comes. If possible, the balloon should be much higher than the model, and the string must be pretty snug. A loose balloon will only wreck the model or catch the prop, since you can't move it as fast as you need to.

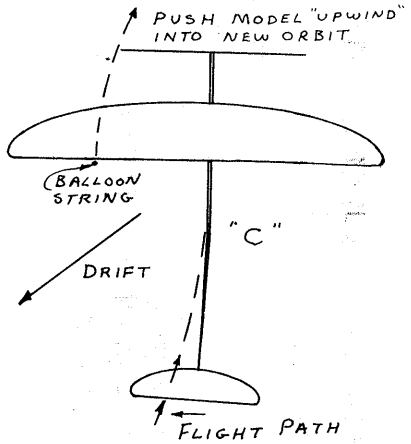
Three methods were discussed before, as illustrated in "A", "B" and "C" below, along with Fig. 1 & 2. "A" is the basic method outlined by Bruce Paton in 1963. The outboard wing is allowed to contact the string, and the model rotates 180° and you release it. Fig. 1 shows the action; the model winds up just over one flight circle upstream of it's original orbit. Models in critical trim or those with extreme offset in the wing may either stall off the line or simply slide down the string.

This behavior can be overcome in some cases by using "B" or "C". In "B", the model is contacted on the inboard wing and allowed to pivot as before. Once again, models with critical trim may spin off the line if you do not use a delicate touch. In "C", the model is contacted just behind the wing and is slowly pushed into a new orbit as in Fig. 2. You must move slowly in order to prevent a stall, but the model generally loses less altitude than with other methods.

An excellent method developed by Bob Champine is shown in "D" and Fig. 3. Incredible as it may seem, Bob passes the string through the prop arc (takes practice and timing to get it right!) and gets the string next to the inboard side of the motor stick. Now, with very careful moves, he "leads" the model where he wants it. It is easy to make one of two mistakes here - either stall the model by a sudden move and catch the prop, or snag the wing or prop as you release the model in the new orbit.

Two comments about rules are in order. First, AMA flights may not be steered; the time stops when you first touch the model. Second, FAI now permits three steers of fifteen seconds each per flight, and this is a lot of time which relieves the pressure somewhat. Although no clear ruling has ever been made, it is the opinion of most U.S. officials that you must break loose at least momentarily at the end of the fifteen second interval. It is to your advantage to do this anyway; if you can't complete a steer in 15 seconds your are either out of position or too tense to do it in unlimited time. Break away, take a couple of deep breaths and try on the next circle!





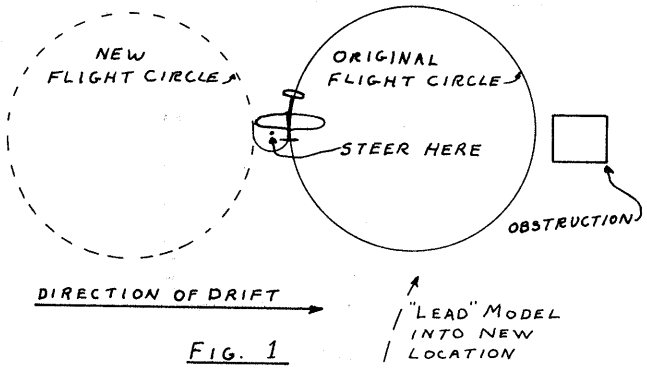


FIG. 1

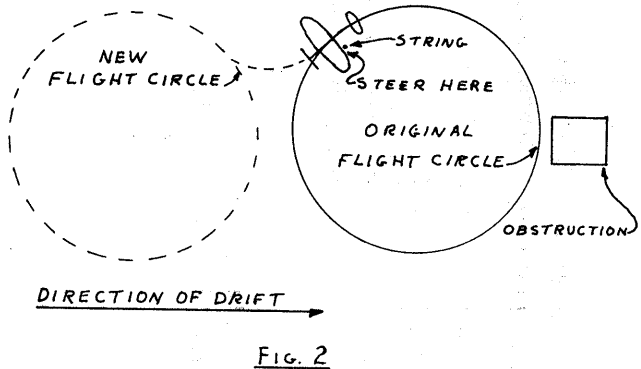
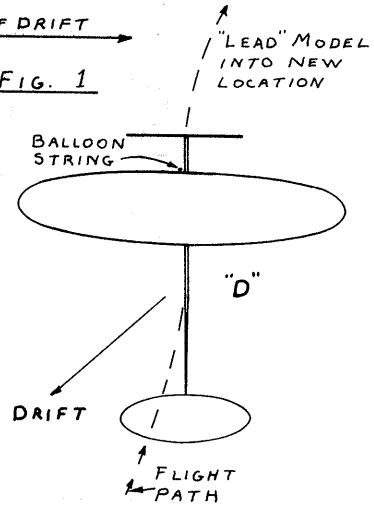


FIG. 2



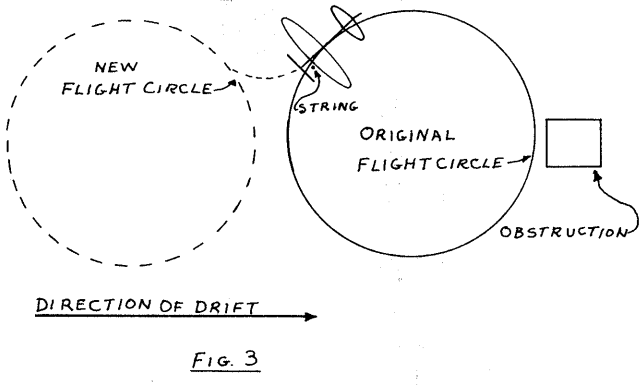
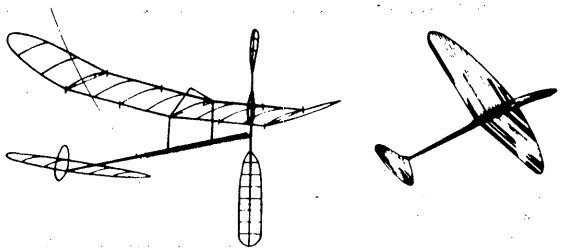


FIG. 3

The Voice of N.I.M.A.S. JUN·1969

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

PAUL H. ALLEN, JR., 18821 E. Leandora Ave., Glendora, Cal. 91740
CHARLES E. BRAZZEL, 3616 Hester Lane, Huntsville, Ala. 35810
FRED EMMERT, 300 Davey Glen Rd., Apt. 3509, Belmont, Cal. 94002
HOWARD HAUPT, 5714 Bakewell St., San Diego, Cal. 92117
TOM KILLOUGH, 7805 Mallard Rd. SW, Huntsville, Ala. 35802
WILLIAM NAKASHIMA, M.D., 21707 McCoy Ave., Riverside, Cal. 92508
VIRGIL A. SANDBORN, 917 Cheyenne Dr., Ft. Collins, Colo. 80521

Honorary Members

EDUARDO GRIPPO, Av. Mitre 2028, Florida Prov. Bs. As. Argentina

Family Memberships

PETER A. SANDBORN, 917 Cheyenne Dr., Ft. Collins, Colo. 80521

Indoor Nats - Reminder

The deadline for advance entry in the 1969 Nats is June 15, 1969. After this date you must enter in person at Willow Grove NAS, near Philapelphia, Pa., and pay a substantial late entry fee. However you enter, you must register at Willow Grove NAS before you fly indoor events at Lakehurst, N. J. Registration at Willow Grove opens at 8 am on July 14, 1969, and the Indoor Rubber events begin at noon the same day. This calls for prompt registration and an immediate trip to Lakehurst. A special line will be set up to facilitate indoor registration, and Pete Sotich has made available maps showing the fastest route from Willow Grove to Lakehurst.

Meanwhile, Senior and Open indoor contestants will have to share the timing load by the time-a-flight-fly-a-flight system. Also, volunteer help is needed to help officiate and time Junior flights. A few people have offered their services, but quite a few more are needed. Volunteer by sending your name to Box 545, Richardson, Texas 75080. Be sure to specify when you can help if you can't help with Rubber on July 14 and HLG or Scale in July 15.

Indoor Scale At Nats

Besides the regular AMA sponsored Indoor Scale event (monoplane and multiplane combined with trophies to 3rd in each age group), there will be two other scale events sponsored by NFFS. The first is the Navy Event - for any prop driven navy (any nationality) airplane - flown to AMA rules and judged by Navy personnel - all ages combined plus Jr. high point - trophies by NFFS. The second event is Peanut Scale, using official Peanut rules and with trophies by Bill Hannan.

Scale registration: For the AMA event you must register at Willow Grove. For the Navy Scale and Peanut Scale event you can register:

1. By mail with Jim Hanst or Paul Kastory prior to July 1, 1969. (Jr. & Sr. $1; Open $1.50)
2. In person at Lakehurst NAS, before 12 noon on July 15, 1969. (Jr. & Sr. $1.50; Open $2)

Jim Hanst
Box 421, R. D. 2
Valencia, Pa. 16059

Paul Kastory
37 Tanglewood Dr., R.D. 3
Valencia, Pa. 16059

NFFS Symposium

The 1969 NFFS Symposium will be held Tuesday evening July 15, 1969 at the Chapel of Willow Grove NAS. The Symposium Report will be published in time for delivery at the Symposium, and the price will be $3.50 per copy for AMA members or $4.50 for non-AMA members.

The Report contains 14 papers by recognized fliers of FF and Indoor. Tom Vallee contributed a paper "Hall Meteorology, Geometry and Low Ceiling Endurance" which casts a lot of light on the problems of flying indoor under less than ideal conditions.

If you missed the 1968 Report, it can be had along with the 1969 Report for $6, sale beginning at the Nats. Advance orders for either the 1969 Report by itself or the combo offer (request the 1968-1969 Combo) by sending a check for the proper amount to Dick Lyons, 717 Thomas Court, Libertyville, Ill. 60048 prior to July 15, or to Annie Gieskieng, 1333 S. Franklin St., Denver, Colo. 80210 after July 15, 1969.

FF/Indoor Ballot

Subscribers to AMA's Competition Newsletter and NFFS members received a ballot (the AMA ballot covers all model categories, while the NFFS ballot covers only FF/Indoor) which should be acted upon immediately. These really are not ballots, but are opinion polls. Speaking as a former CB member and Chairman, it is highly frustrating to try to determine membership attitudes toward proposed rules; and this "ballot" is an attempt to get inputs from more of the membership. Rather than gripe about rules changes after the fact, express your opinions through these ballots!

The indoor portions of the rules proposals deal with indoor cabin definitions and a proposed change in definition of indoor official flight. I hope that the presentation below comes out - it is reproduced from Competition Newsletter. It is a shame that AMA HQ has not seen fit to publicize these in the official publication (AAM)! On the basis of the info presented below, express your opinion to the FFCB member of your district (listing in each AAM) or to Joe Boyle, FFCB Chairman, 219 Shenandoah Rd., Hampton, Va., 23361 immediately!

Indoor Official Flight, Unofficial Flight, Timing and Scoring. The CB is currently taking an initial vote on a proposal to revise rule book paragraphs 8.13, 8.14, 8.15 and 8.16 as follows.

"8.13 Official Flight. Each contestant shall be allowed a total of five flights. All flights are official flights regardless of duration. Delayed flights are not recognized, with one exception (see 8.14). Flights during which any part is dropped shall be considered an official flight with no time recorded."

"8.14 Unofficial Flight. An unofficial flight occurs when a model strikes the balloon or tether of another contestant who is attempting to retrieve a model. At this point the contestant can make a decision as to allowing the time to continue until the flight is complete, or call it a no flight (no time or no attempt is recorded). He must make that decision immediately and cannot reverse it later."

8.15 Timing of Flights. Revise this paragraph by shortening as follows: "If the model does not free itself within the 10 seconds allotted, the watch shall be stopped, 10 seconds deducted from the time indicated, and the result recorded." (Delete the balance of the paragraph.)

Indoor Cabin. CB member comments on this subject have resulted in the chairman circulating a proposal for initial vote providing for the maximum cross-section to be taken at some point on the fuselage which contains the rubber motor. At the same time, two cross-proposals are being circulated for initial vote. One provides for the maximum cross-section to be taken at a point 1/4 the fuselage length, measured from the front of the nose block. The other provides for changing rule para. 8.4 (after "the wing shall be [illegible] square.") as follows: "The maximum cross-section must occur at some point on that portion of the fuselage(s) which houses the motor(s). The surface area of that portion of the fuselage(s) which houses the motor(s) shall have not less than 90% of its/their surface area covered with a material which does not contribute to the compression load carrying capabilities of the fuselage."

Junior NIMAS Awards

GOLD CAT, II RUBBER AWARD - 20:52, Terry Buddingh

FAI INDOOR REPORT

Qualifier Notification

Very little has been said about it this year (not even by AMA HQ), but it is very important for any qualifier who finds himself unable to advance to the next round to let this be known. No matter why you can't fly in the next round - you must notify the first runner-up from the Quarter-Final that you qualified in. You really should tell AMA HQ and Clarence Mather (Program Manager). This used to apply to the complete indoor program, but it applies to Q-F and Semi qualifiers only now. So, if your name is listed in any of the results from Quarter-Final Trials below and you can't make it to any of the Semi-Finals listed, let this be known as soon as you decide! If you don't know who the runner-up is, contact the CD of your Q-F and

have him notify the runner-up. Clarence Mather's address is: 3880 Ecochee Ave., San Diego, Cal. 92117.

Semi-Finals Schedule

WEST COAST - June 14-15, 1969. Cow Palace in San Francisco, 98' ceiling. Tentative schedule - 2 flights 6/14; 4 flights 6/15. Joe Bilgri, 1255 Blackfield Dr., Santa Clara, Cal. 95051.

NORTH CENTRAL - June 21-22, 1969. Michigan State Fair Coliseum in Detroit, 65' ceiling. 3 flights on 6/21; 3 flights 6/22. Paul Crowley, 32604 Tecla, Warren, Mich. 48093, ph. 313-294-0266.

SOUTH CENTRAL - June 21, 1969. John Mabee Gym at Tulsa University, 32' ceiling. 6 flights 8 am to 5:30 pm on 6/21. CD Bill Salnikov, 9906 S. Yale, Tulsa, Okla. 74135.

EAST COAST - June 29, 1969. Hangar #5 at Lakehurst, N. J. 150+' ceiling. Chester Wrzos, 184 Oak St., E. Orange, N. J. 07018, ph. 201-673-7951.

Qualification Trial Results

DETROIT AREA LOCAL QUAL. TRIAL, Apr. 13, 1969, 65' ceiling

Dick Kowalski	22:34	24:15	46:49
Bob Bienenstein	20:26	20:45	41:11
Pat Green	19:37	21:19	40:56
Ed Stoll	18:26	21:05	39:31
Paul Crowley	17:21	18:19	35:40
Paul Simon	16:47	18:21	35:08
Hardy Brodersen	15:09	18:13	33:22
Don Roberts	12:48	16:39	29:27

CHICAGO AREA QUARTER FINALS, May 4, 1969, 90' ceiling

Erwin Rodemsky	23:29	22:06	45:35
Charlie Sotich	21:24	21:03	42:27

TULSA AREA QUARTER FINALS, May 9, 1969, 37' ceiling

Bob Dunham			22:59
Bobby Dunham			
Jim Gardner			
Bobby Hanford			

ST. LOUIS AREA QUARTER FINALS, 50' ceiling.

Paul Tryon	12:02	11:54	23:56
Dick Hardcastle	10:55	11:24	22:19
Tony Schott	9:04	9:30	18:34
Nan Tryon	4:33	6:47	11:20

DETROIT AREA QUARTER FINALS, May 10, 1969, 65' ceiling

Paul Crowley	18:44	12:37	31:21
Dick Kowalski	12:53	17:25	30:18
Pat Green	19:27	8:47	28:14
Bill Hulbert	12:38	12:31	25:09
Bob Bienenstein	11:20	11:05	22:25
Carl Jaeger	7:08	8:55	16:03

VIRGINIA AREA QUARTER FINALS, May 17-18, 1969, 20' ceiling

Bob Champine	17:04	18:10	35:14
Hal Crane	16:11	18:16	34:27
Tom Vallee	14:50	18:17	33:07

SOUTHERN CALIF. QUARTER FINALS, May 18, 1969, 75' usable

Bob Randolph	24:24	23:40	48:04
Bill Gibbs	20:57	18:11	39:08
Bob Gibbs	19:34	18:09	37:43
Warren Williams	18:29	18:08	36:37
Linda Randolph	18:16	17:32	35:48
Paul Allen	18:26	16:36	35:02

NORTHERN CALIF. QUARTER FINALS, May 25, 1969, 98' ceiling

Bud Romak	29:04	29:00	58:04
Joe Bilgri	19:37	22:35	42:12
Lew Gitlow	20:55	16:20	37:15
Carl Rambo	17:00	16:08	33:08

LAKEHURST AREA QUARTER FINALS, May 25, 1969, 150+' ceiling

C. V. Russo	27:07	32:11	59:19
Pete Andrews	27:07	31:49	58:56
John Triolo	26:42	25:45	52:27
Julius Rudy	24:18	23:46	48:04
Jim Vale	20:35	19:00	39:35

NORTH TEXAS AREA QUARTER FINALS, May 25, 1969, 30' ceiling

Stan Chilton	14:57	15:45	30:32
Bud Tenny	12:15	11:41	23:56
Dick Ganslen	12:06	10:24	22:30
Jim Clem	11:27	9:11	20:37
Kristi Tenny	7:41	8:43	16:24

CLEVELAND AREA QUARTER FINALS, May 25, 1969, 33' ceiling

Ron Ganser	5:55	10:31	16:26
Ronnie Ganser	6:22	7:43	14:05
Dr. Vernon Hacker	6:44	5:53	12:37
Lou Willis	5:42	6:12	11:54

FAI Finals

Although no final announcement has been made, it has been indicated by the program manager (Clarence Mather) that the Team Selection Finals will be held at Lakehurst in the time following the Nats events. That is, from 8 pm to midnight on July 14, 1969 and from 5 pm to midnight on July 15, 1969. The site is firm, but possible alternative flying times are being considered.

RECORDS? MAYBE!

ST. LOUIS INDOOR MEET, Apr. 20, 1969 Cat. I
East St. Louis Armory
Open Cabin - 13:44.4, Bob Randolph

VIRGINIA AREA QUARTER FINALS, May 17-18, 1969 Cat. I
Willis School, 20'6" ceiling
Open AMA Cat. I FAI - 18:17.8, Tom Vallee

CONTEST CALENDAR

ILLINOIS - Chicago. Weekly indoor sessions at the Washington Park Armory, contingent upon National Guard drill schedules. HLG 9 am to noon and 4 pm to 5 pm; indoor rubber noon to 4 pm. Call Armory at 312-752-9006 or 312-752-9795 to check drill schedules before leaving home.

MARYLAND - Silver Spring. Indoor session at JFK High School, June 13, 1969. Bill Saunders, 11613 Le Baron Terrace, Silver Spring, Md. 20902, ph. 301-593-7196.

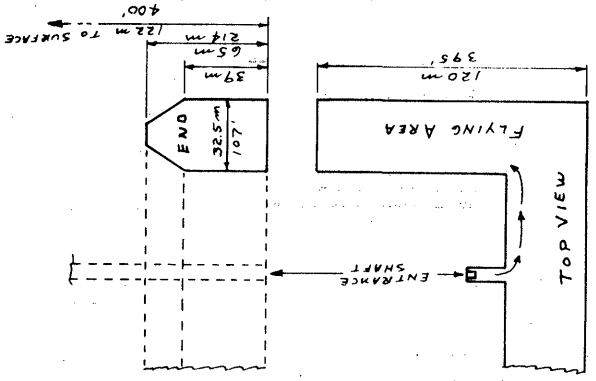
OKLAHOMA - Tulsa. Tulsa Glue Dobbers 20th Annual (AAA) Model Airplane Championships will have a full slate of outdoor events (FF, CL & RC) plus: IHLG (Jr. & Sr.-Op); Easy B (Jr. & Sr.-Op.); Scale (Jr. & Sr.-Op.); Paper Stick and Indoor Stick. 4 pm to 10 pm, July 4 and July 5, 1969.

STATE OF THE ART

Bobby Dunham won Indoor Cabin at the 1968 Nats and placed 2nd in Indoor Stick with the dual design featured this month. It was designed his dad, and the design is excellent for Juniors. The cabin design has two unique features which make it especially adaptable for Juniors - the fuselage is based upon a rolled tube which has lightening holes cut in it; while the thrust bearing is similar to normal indoor stick practice. Winding is done from the rear with prop in place, which leaves only tail hook-up after winding.

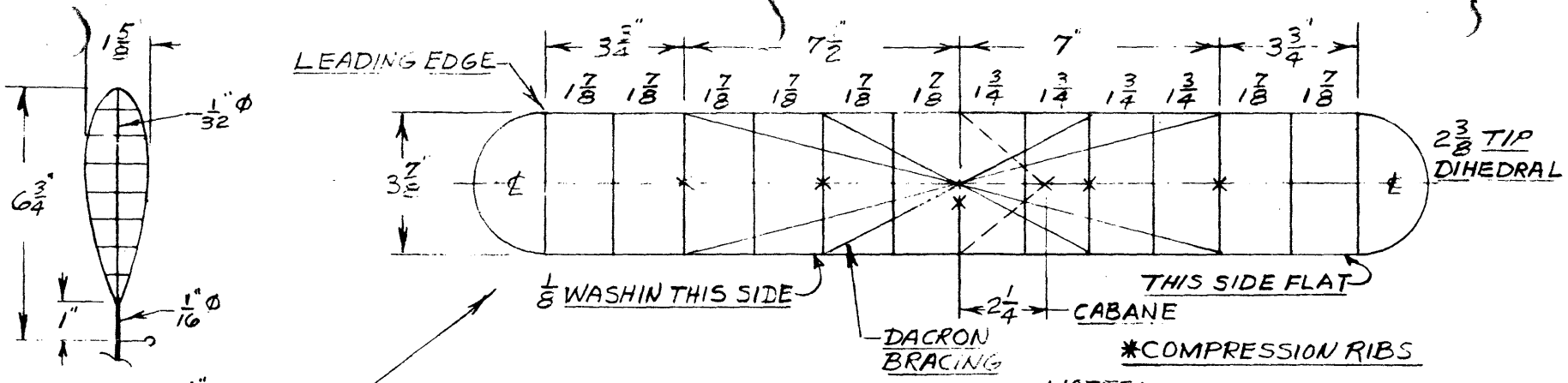
INDOOR WORLD CHAMPIONSHIP

The May '69 INAV announced that the 1970 W/Ch was to be relocated to Slanic Prahova - that fabulous salt mine in Romania. The sketch below was copied from info furnished by Rudolf Cerny of Czechoslovakia. The site is out in the middle of a football-shaped salt dome which is 1.5 miles long, with oval cross section about 1/2 mile x 1/4 mile in size. Air temperature in the mine is constant at 9° to 10° C, or 48° to 50° F. Humidity is normally just under 50% except in the summer, when it rises appreciably. Therefore, the W/Ch will be scheduled in March, April or May. The drawback of low temperature is mostly offset by complete absence of drift, so the 100' width is not a problem. Cerny has said this is probably the best indoor site in the world, and it sounds like it!



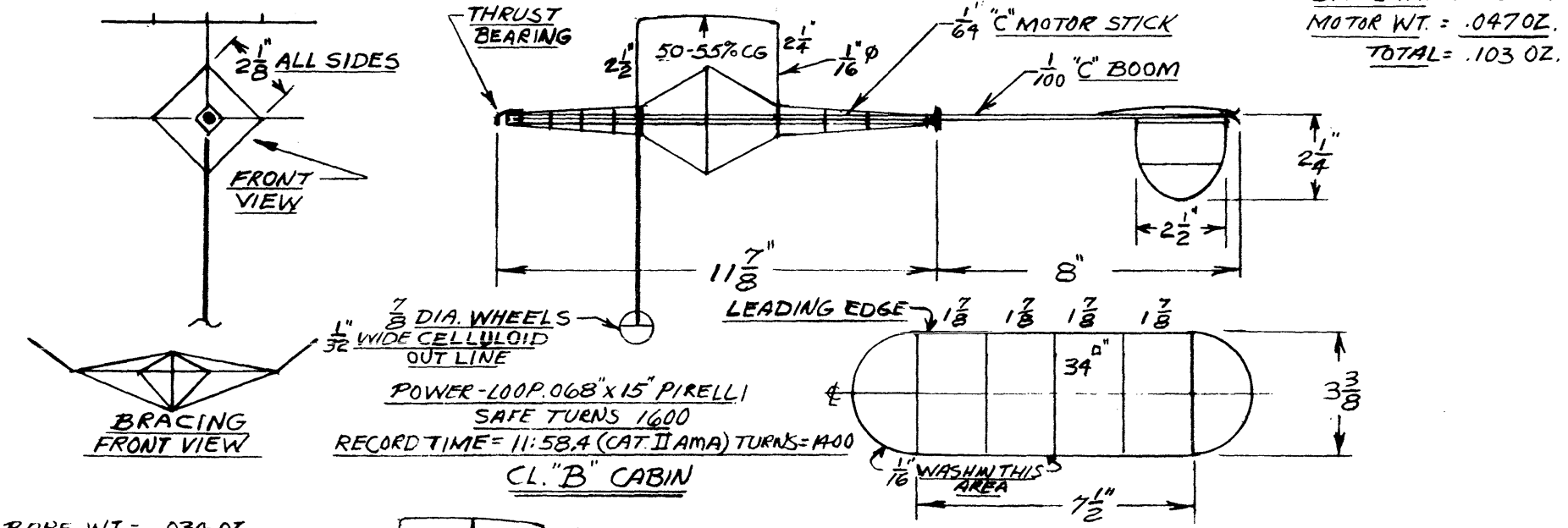
Mini - INAV?

This issue is somewhat abbreviated - the alternative was to make up a full issue later, after the models were ready for the Semi. I chose this route to insure that the more important flying schedules, rules matters, etc. could go in time to help where needed. So, whatever was on hand and ready is what you get!



NOTES:
1. CABIN COVERED W/ CONDENSER PAPER.
2. ALL SURFACES MIKE.
3. PROP REMOVABLE FROM FRONT BEARING

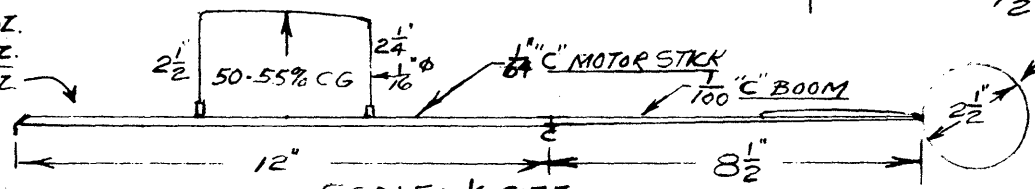
BARE WT. = .056 OZ.
MOTOR WT. = .047 OZ.
TOTAL = .103 OZ.



POWER-LOOP .068" X 15" PIRELLI
SAFE TURNS 1600
RECORD TIME = 11:58.4 (CAT. II AMA) TURNS = 1400

CL. "B" CABIN

BARE WT. = .034 OZ.
MOTOR WT. = .033 OZ.
TOTAL = .067 OZ.



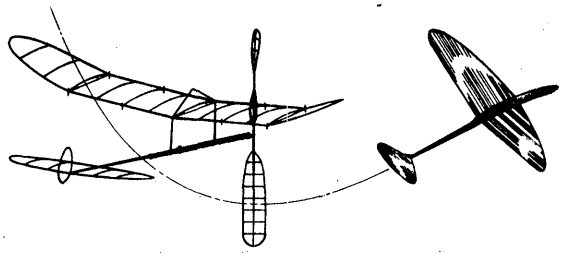
CL. "B" MIKE COVERED STICK

POWER-LOOP .045" X 16" PIRELLI
SAFE TURNS 2000
RECORD TIME = 15:23 (CAT. II AMA)
TURNS = 1600

SCALE: 1/4 SIZE

The Voice of N.I.M.A.S. JUL-AUG 1969

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

$2/ YEAR NIMAS DUES $1/ YR ADDITIONAL

THE 1969 INDOOR NATS

Indoor Stick

Junior

1.	Ronny Ganser	22:55.6
2.	Michael Keuhne	12:03.2
3.	William Schlarb	7:56.0
4.	Michael Porykaza	6:12.2

Senior

1.	Dale Hacker	16:51.1
2.	Dan Domina	14:51.8
3.	Jan Sefviates	13:54.4
4.	Terry Kuehne	9:54.0
5.	Susan Weisenbach	9:09.5
6.	Ken Fitch, Jr.	4:53.6

Open

1.	Ron Plotzke	42:53.0
2.	Joe Bilgri	38:21.4
3.	John Triolo	37:56.6
4.	Jim Richmond	37:00.5
5.	Pete Andrews	35:09.2
6.	C. V. Russo	33:45.4
7.	Al Rohrbaugh	33:20.0
8.	Bud Romak	30:46.0
9.	Ron Ganser	29:24.8
10.	Bob Randolph	29:01.0

Paper Stick

Junior

1.	Ronnie Ganser	10:20.1
2.	Michael Kuehne	8:58.2
3.	Brian Webster	8:47.0
4.	James Haught	7:39.5
5.	Bruce Pailet	7:39.4
6.	William Schlarb	6:59.0
7.	Barry Pailet	5:57.2
8.	Phill Lawry	5:15.2
9.	Justin Mills	3:31.0
10.	Jason Tryon	3:14.2

Senior

1.	Dan Domina	14:49.4
2.	Jan Serviates	14:00.0
3.	Susan Weisenbach	13:54.5
4.	Terry Kuehne	10:12.9
5.	Francis Donnely	9:55.0
6.	Paul Andrews	5:06.2
7.	Ken Fitch, Jr.	4:25.8
8.	Dale Hacker	4:03.0

Open

1.	Jim Richmond	26:56.0
2.	Ed Stoll	21:17.3
3.	Al Rohrbaugh	20:54.1
4.	Charlie Sotich	18:15.0
5.	Dan Belieff	18:08.7
6.	Pete Andrews	17:09.0
7.	Bob Randolph	16:47.0
8.	Phil Klintworth	16:45.2
9.	Tom Vallee	16:33.6
10.	Bob Clemens	16:20.0

Indoor Cabin

Junior

1.	Ronnie Ganser	15:37.2
2.	Michael Kuehne	8:22.9
3.	Barry Pailet	4:12.0
4.	Bruce Pailet	3:56.0
5.	William Schlarb	3:55.5
6.	James Mills	2:55.0
7.	Justin Mills	2:10.8

Senior

1.	Dan Domina	9:43.0
2.	Jan Serviates	9:28.0
3.	Terry Kuehne	7:08.0
4.	Dale Hacker	6:50.8
5.	Susan Weisenbach	5:11.0
6.	Ken Fitch, Jr.	1:10.2

Open

1.	Jim Richmond	22:43.2
2.	Bucky Serviates	22:42.6
*3.	Bob Randolph	21:12.8
4.	Al Rohrbaugh	21:07.5
5.	Ron Ganser	15:05.0
6.	**Warren Williams**	14:19.0
7.	**Hal Crane**	12:33.6
8.	**Charlie Sotich**	5:43.2
9.	Tom Vallee	0:41.2

Indoor HLG

Junior

1.	Mark Kerr	105.0
2.	David Belieff	99.0
3.	Donald Ganser	97.5
4.	Warren Carter	95.2
5.	David Pfeiffer	90.8
6.	Brian Pardue	89.0
7.	William Schlarb	84.6
8.	Richard Sherman	84.6
9.	Justin Mills	84.5
10.	Matthew Mills	83.2

Senior

1.	M. Thompson	123.6
2.	Jan Serviates	122.1
3.	Gary Myers	112.9
4.	George Brown	111.7
5.	Ken Fitch, Jr.	108.8
6.	Henry Nixon	106.0
7.	Denny Dock	103.3
8.	Susan Weisenbach	103.0
9.	Lewis Cleveland	98.5
10.	Terry Kuehne	95.8

Open

1.	Rudy Kluiber	152.2
2.	Bucky Serviates	135.1
3.	Donald Reed	134.1
4.	Larry Miller	131.0
5.	Ron Higgs	127.5
6.	Jim Kutkuhn	127.1
7.	Robert Gutai	124.6
8.	Dan Belieff	123.9
9.	James Mills	121.9
10.	John Pfeiffer	111.0

*Once again, Randolph's cabin model (reworked from last year) was under consideration for legality by the FFCB. He was allowed to fly, pending a ruling by the CB. Now, it gets more complicated. Frank Ehling (Technical Director of AMA) had also polled the entire Contest Board on the legality of the model and did not have the results back yet. Nats Tabulation officials felt that trophies should be held up pending a ruling of the FFCB, but John Worth directed that trophies be awarded and to note on the published results that a Contest Board ruling was pending. If the ruling went against Randolph, the trophies were to be shuffled to reflect this placing: Rohrbaugh - 3rd; Ganser - 4th; Williams - 5th. Meanwhile, the FFCB ruled (in Nats meeting) that the model was illegal and Ehling was notified. Presumably, no further action was taken pending results of the poll of the whole CB.

1969 NATS COMMENTARY

The very first event of the Indoor Nats occurred the day before at the FAI Finals. Thanks to a special effort by AMA HQ, both late Nats entry and Nats registration was possible for all Semi-Final qualifiers; this was conducted at the hangar during the Finals. Very commendably, HQ waived late entry fees and made the on-site registration available when it was realized that FAI participants had been unavoidably shortchanged. The problem was that none of the FAI participants knew exactly when the Finals would be held. The announcement of Sunday, July 13 for the time of the Finals came two weeks after deadline for Nats entry and this was the first inkling qualifiers had that the Finals would not conflict with the Nats. Thanks to the special HQ effort, several FAI fliers entered the Nats when they could not have done so otherwise.

On the other side of the coin, HQ adopted a very inflexible attitude about regular Indoor Nats registration which caused entrant hardship and outright boycott by some Eastern fliers. HQ had a very real and vexing problem regarding registration - in times past registration had been conducted simultaneously at the indoor site and at the Navy base. Not only did this create the need for dual records for about 20% of the total Nats entry, but for dual crews - both Navy (housing and mess) and AMA. In the case of limited housing, it was impossible to be fair in allotting housing priorities with two simultaneous registration operations.

Their solution was to require on-base registration for all indoor contestants. This was quite reasonable in itself. However, all registration opened only four hours before official flying began at Lakehurst - about two hours away unless you were intimately familiar with the route. In effect, indoor rubber entrants were limited to two hours to register. Those who lived near Lakehurst had two alternatives - drive to the vicinity of Willow Grove the day before and spend the night in a motel, or to leave home that morning, drive to Willow Grove and register, then drive to Lakehurst - 4 hours of driving in all. Those who were not FAI participants simply didn't enter.

Anyone who tried to express these problems or suggest an alternate procedure (many such procedures having been proved satisfactory in past Nats) met with a stone wall of indifference, lack of communication and/or outright rejection. It is extremely unfortunate that the situation came up, and even more unfortunate that there was no possible recourse and no discussion permitted.

The meet itself went smoothly. CD Chet Wrzos, who was recruited the day before, kept on top of everything and ran an excellent meet. Joyce Jaeger and Jody Tenny did an excellent job of running the desk and recording times as they came in, while Bob Champine processed cabin models and paper stick models. A limited number of Navy timers were on hand, and were supplemented by volunteer timers

gathered from spectators and contestants. Flying conditions were almost uniformly good during the 8 hour flying time, and people took their flights without causing such a big pile-up in final hours of the meet as had been the case in past years.

In Indoor Stick, Richmond was working with a handicap, since his 41:45 model had collapsed when wound with a larger motor. Joe Bilgri and a few others were flying with D ships, but John Triolo and Pete Andrews flew FAI models and did quite well. Suddenly word was passed that Ron Plotzke was making a real good flight. The first reaction was "Ron who?" But then people began to remember that Ron Plotzke was an active and very competent member of the Detroit Balsa Bugs prior to 1961. Just how good Ron is became clear as his "300" landed at 42:43 on the first full wind-up. The model combined some new parts and some parts Ron had flown in the same hangar at the 1961 Nats - I sure wish my models kept that well!

Richmond didn't make another "40", but his Nats flight was his second longest flight ever. John Triolo set a new personal record with his FAI which may be the third longest 65 cm flight ever: Richmond's 41:45; Kalina's 39:18 and then John's 37:56.

Meanwhile, Richmond won paper stick with one flight, then won Cabin with his second flight. Incidentally, that time was nearly beaten when Bucky Serviates made the last official flight of the day - just .6 second short!

HLG was ably CD'ed by Jim Purdue with assistance from Bob Champine and Marty Schindler from NIMAS ranks, and others from NFFS ranks. I was unable to spend enough time there to get a report, but I'll gladly print a report of HLG happenings if anyone will send it!

All in all, this was a very successful Nats, and much of the success is due to a NIMAS member still in the Navy. He is LCDR "Stan" Stanwick, who is one of the pioneers of modern indoor flying and is well known to Eastern fliers. Stan coordinated the Indoor Nats from the Navy end, and was responsible for all the logistics and the crew of Navy timers. Stan will soon retire from the Navy, and he will be back flying in his "old haunts" - the Lakehurst hangars. There were numerous volunteer timers on both days - too many to mention - but all who flew certainly owe them a big vote of thanks. Things would not have been as smooth as they were without all this dedicated help which supplemented the Navy timers.

FAI INDOOR FINALS

		I	II	III	IV	V	VI	Total
1.	Jim Richmond	26:53	34:32	41:45	33:23	13:25	33:24	76:17
2.	Pete Andrews	26:50	-	17:50	32:39	33:08	34:15	67:23
3.	Clarence Mather	32:03	22:41	32:34	19:35	28:16	22:15	64:37
4.	John Triolo	25:10	22:37	27:04	28:53	20:21	35:00	63:53
5.	C. V. Russo	31:01	31:30	28:46	7:41	32:06	16:05	63:36
6.	Joe Bilgri	24:42	26:16	31:01	32:29	28:57	27:14	63:30
7.	Erwin Rodemsky	5:26	28:46	25:37	24:44	33:31	13:25	62:17
8.	Bud Romak	29:22	30:19	31:04	16:20	27:03	11:27	61:23
9.	Al Rohrbaugh	15:14	25:09	29:04	25:13	32:08	28:59	61:07
10.	Dick Kowalski	0:14	30:57	0:27	11:06	28:59	0:28	59:53
11.	Bob Randolph	27:51	30:13	27:36	11:32	26:04	-	58:04
12.	Bill Hulbert	0:27	26:29	22:34	24:09	26:47	28:37	55:24
13.	Paul Tryon	17:28	19:14	21:36	9:33	13:54	23:30	45:06
14.	Bud Tenny	14:57	15:57	20:38	22:19	-	16:54	42:57
15.	Stan Chilton	12:51	-	-	-	-	-	12:51

Fifteen men, calm but humid air in Hangar #5 at Lakehurst, and a crew of dedicated timers under the direction of CD Chet Wrzos - that's what it took to stage the 1969 Team Selection Finals. Jim Richmond, Clarence Mather and Al Rohrbaugh were the 1968 Indoor Team, and had a "bye" into the Finals, while the other 12 entrants qualified by winning at their respective Semi-Finals.

Monday morning quarter-backing of an event such as the Finals always includes a discussion of "the best time to fly". It seems safe to say that it made very little difference at this meet. No matter how you look at it, each round had a share of the high times. Each round had at least one flight longer than 32 minutes. The ten longest flights were pretty evenly spread out. The first came in Round II; III through V had two apiece and Round VI had three of the 10 longest. That score seems to give an edge to Round VI, but that round was cut short by a heavy rain which ruined the calm air and cut short flights by several contestants, including Richmond and Rohrbaugh.

First round times were not unusually high, with Mather, Russo and Romak leading. Russo moved into 1st in Round II followed by Richmond, Romak, Randolph and Mather. Round III - Richmond's 41:45 flight drew good wishes as it was apparent that it would be good, then cheers as it landed. Jim was clearly the leader, and Clarence Mather's second good flight put him in second by about two minutes. Five fliers appeared to be able to beat that 2 minute margin - Russo, Bilgri, Romak, Kowalski and Randolph.

In Round IV, Bilgri pushed a lot closer (3rd), while Pete Andrews began the push that moved him into 2nd in Round V. At the end of Round IV, it was Richmond, Mather, Bilgri, Russo and Romak.

In Round V, Pete Andrews and Russo moved up, putting Bilgri in 5th and Mather in 3rd. Rodemsky's model showed its potential, moving him from 9th to 6th, and Rohrbaugh moved from 10th to 8th and within striking distance if he could get another good flight.

Round VI held few surprises, because of the sudden storm. The air began to "boil" - models did everything except turn upside down. Pete Andrews and John Triolo got their best flights of the meet this round, landing before the turbulence built up. Suddenly, the meet was over and word was passed to pack the models quickly so they could open the door and wheel airplanes in out of the storm.

Hal Crane, Bob Champine, Carl and Joyce Jaeger, Manny Radoff and Ernie Kopecky helped to time, and perhaps other people helped also. The entire meet moved smoothly under the guidance of Chet Wrzos; the schedule was necessarily tight because of the one-day availability of the hangar, but a strict draw rotation prevented pile-up and lost flights. It was truly a memorable meet!

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

BOB BIENENSTEIN, 9821 Colwell, Allen Park, Mich. 48101
J. G. PAILET, 30 Emerson Rd., Brookville, Glen Head, N. Y. 11545
RON J. PLOTZKE, 36659 Ledgestone, Mt. Clemens, Mich. 48043

Family Memberships

BRUCE & BARRY PAILET, 30 Emerson Rd., Brookville, Glen Head, N.Y.11545

Michael B. DesJardins

It is sad to announce that Mike DesJardins was killed June 15 when a Formula A racing car spun into the pit area where Mike was helping some friends. Mike was avidly interested in many activities, and gave much of himself to each activity. FF modelers will remember Mike's very effective term as "benevolent dictator" (Executive Director) of NFFS, and his work with the Team Selection Program. Mike is sorely missed, especially in his "home club", the Magnificent Mountain Men of Denver.

NFFS Symposium

SYMPO II, the 1969 NFFS Symposium Report, is available for $3.50 per copy to AMA members or $4.50 for non-AMA members. The 1968 Report is available with SYMPO II; $6 for both. The 1969 report has a paper on hall metrology and indoor flying strategy by Tom Vallee, and a discussion of neutral point location by Hal Crane. Crane's paper gives a slightly different approach to margin of stability than the Cole method (Jan. '69 INAV - C.M.O.S.). Many other excellent papers on FF are included; it's a bargain!

NIMAS Awards

SILVER CAT. I HLG AWARD - 0:21.3, Bobby Dunham

GOLD CAT. I HLG AWARD - 0:26.6, Bobby Dunham

DIAMOND CAT. I HLG AWARD - 0:27.5, Bobby Dunham

DIAMOND CAT. I RUBBER AWARD - 15:20, Bobby Dunham

SILVER CAT. I RUBBER AWARD - 11:19.0, Bob Dunham

GOLD CAT. I RUBBER AWARD - 12:54, Bob Dunham

DIAMOND CAT. I RUBBER AWARD - 15:09, Bob Dunham

SILVER CAT. I HLG AWARD - 0:26.7, Bob Dunham

GOLD CAT. I HLG AWARD - 0:30.0, Bob Dunham

SILVER CAT. III RUBBER AWARD - 28:00.6, Hal Crane

NIMAS Aces

Bob Dunham won his Cat. I Rubber Ace award with three of his flights at the Tulsa Semi-Finals while his son Bobby "polished off" his Cat. I Rubber Ace as he became the runner-up for the Finals. Then, Bobby became the first Triple Ace by adding Cat. I HLG Ace to his laurels as he logged his flights at the Tulsa Glue Dobber Annual. This is one father-son team that really flies to win!

Scale Results?

We already have pictures on hand from the three Indoor Scale events at the '69 Nats, but we do not have the final results from the Navy Scale event and Peanut Scale. Most likely these results will be on hand for the Sept. issue.

FAI INDOOR REPORT

Semi-Final Results

Western Semi-Finals — Cow Palace - 99' 6" ceiling

Bud Romak	26:01	27:37	53:38
*Carl Rambo	22:38	28:00	50:38
Joe Bilgri	25:11	24:45	49:56
Paul Allen	21:07	24:16	45:23
Bob Randolph	19:11	20:02	39:13
Linda Randolph	18:12	19:52	38:04
Warren Williams	18:50	18:00	36:50
Bob Gibbs	12:07	14:33	26:50
Bill Gibbs	8:49	14:16	23:05

*Carl Rambo resigned his position, and Paul Allen waived the chance to step up, leaving Bob Randolph as the third representative for this Semi-Finals.

Detroit Area Semi-Finals — State Fair Coliseum - 65'

Dick Kowalski	23:40	25:07	48:47
Erwin Rodemsky	23:19	23:02	46:21
Bill Hulbert	24:17	21:49	46:06
Paul Crowley	21:10	20:09	42:12
Lou Willis	13:40	20:32	34:12
Carl Jaeger	15:08	16:04	31:12
Pat Green	20:16	5:28	25:44

Tulsa Semi-Finals — John Mabee Gym; U of T - 34'11"

Stan Chilton	13:11	18:35	31:46
Bud Tenny	14:00	16:34	30:34
Paul Tryon	14:29	14:01	28:30
Bob Dunham II	13:06	15:20	28:26
Bob Dunham	12:54	15:09	28:03
Jim Clem	12:18	15:43	28:01
Dick Ganslen	10:30	13:02	23:32
Nan Tryon	9:57	10:35	20:32
Jim Gardner	10:09	9:08	19:17

Eastern Semi-Finals — Lakehurst #5 - 154' ceiling

Pete Andrews	34:34	32:27	67:01
John Triolo	29:41	32:10	61:51
C. V. Russo	30:18	27:53	58:11
Ron Ganser	26:03	31:08	57:11
Hal Crane	26:50	26:05	52:55
Bob Champine	26:35	26:08	52:43
Julius Rudy	19:06	21:06	40:12

FAI Program Summary

We have chosen a very strong team to represent the U. S. in Romania next spring, and these fliers had their "baptism of fire" in the challenging Lakehurst Finals. As usual, the hangar was humid, but with otherwise good conditions until the last. We can rest assured that Jim, Pete and Clarence will do their very best at the '70 World Championship, judging from their past performances.

The sad part is that we may have let them down in a very real sense. Most of you know that the money from the program entry fees is used to help cover team travel expense from home to the port of embarkation. In past years the program participation has been much higher than this year, with the resulting increase in the Inboard Travel Fund. The participation in past years has been: 1962 - 91; 1963 - 85; 1965 - 71; 1967 - 89. This year a grand total of 59 people entered the local Qual. Trials - nearly 20% fewer than the previous low ebb. The Inboard Travel Fund will be pro-rated between the team members according to how far they have to travel, with expenses beyond the amount of the Fund coming out of the team's personal pocketbooks. Some of the pressure has been removed by the FAI Benefit meets held last spring, and these meets can still be held right up to the last minute before the team leaves for Europe.

RECORDS? MAYBE!

TULSA FAI SEMI-FINALS, June 21, 1969, Cat. I AMA
John Mabee Gym, Tulsa University, 34' 11" ceiling.
Jr. AMA Cat. I FAI - 15:20, Robert Dunham II
Jr. Indoor Stick - 15:20, Robert Dunham II
Jr. Paper Stick - 9:52.0, Robert Dunham II
Jr. Cabin - 6:24.0, Robert Dunham II

1969 INDOOR NATS, July 14, 1969, Cat. III
Lakehurst #6, 154' ceiling. (This flight exceeds existing times and may have been filed on.)
Open Paper Stick - 26:56.0, Jim Richmond

INTERNATIONAL CONTESTS

Czech Indoor Nationals

Walter Erbach reports: "The Czechoslovakian Indoor Nationals, held July 5-6 in the pavilion at Brno, was open to all builders and was a major European indoor contest.

There were 19 of the best builders from six countries; Czechoslovakia, Austria, Hungary, Italy, Romania and Yugoslavia. Since the competition was very serious, test flying was permitted only before and after official flying. Three rounds, with no intermission, were flown each day under standard FAI rules. This arrangement means that a modeler must know his model and be sure of its abilities.

High time of the contest was Eduard Chlubny's 33:52, done near the end of the first round. Heavy rains killed flying conditions for portions of each day. The remarkable quality of flying was demonstrated when 5 of the top 6 fliers had at least 3 of their 6 official flights over 25:50.

The prohibition against test flying during the contest develops builders who are very precise, keeping notes on everything. Some builders have complete books; one had a log of all the properties of every piece of wood in his stock." The results:

1.	Jiri Kalina	Czech	31:20	30:56	62:16
2.	Andras Ree	Hungary	31:01	30:35	61:36
3.	Vilim Kmoch	Yugo	28:35	31:56	60:31
4.	E. Chlubny	Czech	33:52	26:38	60:30
5.	A. Popa	Romania	27:46	27:32	55:18
6.	Weigert	Czech	28:59	25:57	54:56

Finland's Indoor Nationals

Esko Hamalainen sent the following report of Finland's Indoor Nats: "As you see, times were quite good in this hall of 13 m height, and my 20:57 is a new Finnish record for halls less than 15 m. Conditions were good, only some drift that caused 3 or 4 hangups in a loudspeaker in the middle of the hall. Practically all of us set new personal records! On Aug. 9-10 we will have the elims to pick our team for the 1970 World Champs in this same site."

1.	Esko Hamalainen	20:06	20:57	41:03
2.	Harro Erofejeff	18:47	19:12	37:59
3.	Esko Tirronen	18:58	18:44	37:42
4.	Harri Raulio	17:06	18:25	35:31
5.	Ralf Ekholm	15:04	18:52	33:56
6.	Pentti Nore	15:38	16:32	32:10
7.	Leif Englund	13:24	13:20	26:44
8.	Olof Nordlund	16:11	3:01	19:12

CONTEST CALENDAR

MARYLAND - College Park. Class AA Eastern Indoor Championships, Sept. 7, 1969, 8:30 am to 4:30 pm. Cole Field House, University of Maryland. HLG, Easy B, Indoor Stick, Paper Stick, Indoor Scale and Unorthodox Aircraft. The unorthodox aircraft event is described thus: Judged on the basis of originality, duration and craftsmanship (equal emphasis). Power optional, but must be suitable for safe indoor operation. CD - George T. Buck, 4215 Howard Rd., Beltsville, Md. 20705 ph. 301-937-7794.

NEW YORK - Hicksville, L. I. Cat. II indoor contest at Cantiague Park, Hicksville, L. I., N. Y. Sept. 28, 1969. Site is 190' dia. dome, 50' high. HLG, Easy B, Indoor Stick, Paper Stick, Scale. CD - Bill Dunwoody, 985 Ft. Salonga Rd., Northport, L. I. N. Y.

TENTATIVE - Record Trials by Bob Randolph, 25145 Lawton Ave., Loma Linda, Cal. 92354 (check with Bob in advance!) Edwards AFB, Calif. (Cat. II) - Aug. 24, 1969 and Bolling AFB (Cat. I) Sept. 16, 1969.

THE PICTURE STORY

Thanks to Bob Clemens, his son Chris, and Tom Vallee for these photos of the Indoor Nats. Pictures numbered from top to bottom:

Left Column

1. Ron Plotzke just after his 42:53 flight.
2. Joe Bilgri after wind-up by Bud Romak.
3. Richmond preparing for Nats official. The model is from same series he won with at West Baden and Rome.
4. Wally Mumper winds Charlie Sotich's cabin.

Center Column

1. Bill Bigge (r.) helps Dan Belieff ready his cabin.
2. Randolph's controversial cabin model. Note retracting landing gear.
3. Dan Belieff launches his cabin on Nats official.
4. Bilgri "D" (Vallee photo).

Right Column

1. Hal Crane steers (?) or beats (?) his cabin model.
2. Deep discussion! Bud Tenny (l.) and Erwin Rodemsky.
3. Randolph gets wind from unidentified helper.
4. Unidentified HLG flier ponders his models. (VALLEE)

LIGHTWEIGHT GLUE?

From the weight standpoint, I always thought that glue is glue is glue, and you only saved weight by careful application of the glue and by careful fitting of the pieces to reduce the amount of glue needed.

However, Curtis Janke suggested that very high viscosity nitrocellulose should make a glue to do the job with less weight involved. After some experimentation, a formula based on 2500 sec. N/C evolved which seemed to be strong enough. The test for strength was made by glueing two 1/16" sq. pieces at right angles in a simple lap joint and then loading the end of one piece (see sketch). Test results indicated that similar application methods between the test material and thinned Duco cement gave joints with 75% as much strength in the new material as with Duco.

A weight test was made by weighing balsa pieces before and after 1/8 cc of glue was added and allowed to dry. The test glue weighed .000185 oz., while the same amount of Duco weighed .00044 oz. - 2.4 times as much. Even if I used twice as much of the new material, the weight would still be less!

MODEL STORAGE AND TRANSPORTATION

Part II - Ready-Made Boxes

Many industrial firms receive shipments of material in boxes which turn out to be ideal for indoor boxes. Quartz rod and tubing comes in boxes which are usually 8" deep, up to 17" wide and up to 40" long, with a lid which slips over the top like the lid of a shoe box. Acoustic ceiling panels come in a variety of box sizes which can be easily adapted to models. Florists make shipments in a similar box, approximately 48" x 18" x 9", also with a slip-off lid. This "shoe box" type lid is preferable for cardboard boxes, and is not much trouble to make in case the box has flaps. Finally, it is not very expensive to have special boxes custom-made at a firm which specializes in this type of work.

Sears and similar stores sell storage boxes which are about 30" long, 13" wide and 15" deep, for prices up to $2.50 apiece, depending upon how sturdy and decorative the boxes are. Such a box (Fig. 1 below) will hold two 65 cm models if packed in the manner shown in Fig. 2. Note that the wings are mounted on the same vertical slide, which necessitates removal of both wings to get the lower one. With care, either fuselage can be removed separately, and all the props are mounted on a single slide.

Hal Crane reports that Acushnet Titlist golf balls are shipped in a box of 24 dozen. This box is double thickness, with an inner box and an outer box. Make the following modifications: 1. Cut three of the four top flaps down to 3" wide. 2. Glue inner box to outer box, using white glue (white glue is ideal for all box work). 3. Leave the outer flap (hinged at rear) 9⅛" wide, and the inner remaining flap is left full width. These changes are shown in Figs. 3 and 4, and arrangement for 2 65 cm models is shown in Fig. 5.

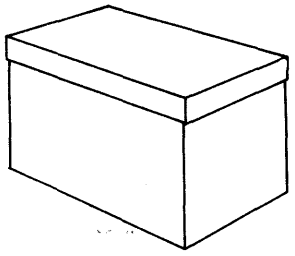
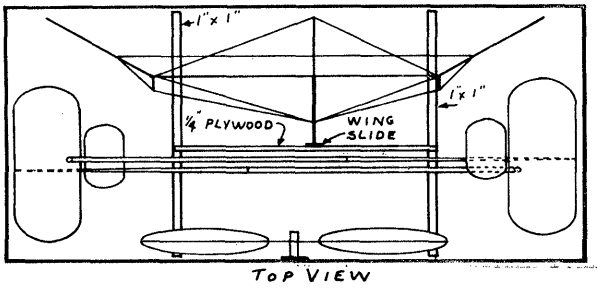
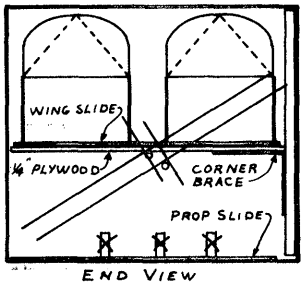


FIG. 1



TOP VIEW



END VIEW

FIG. 2

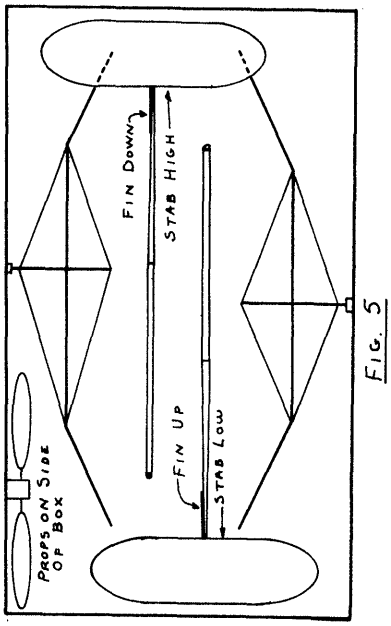
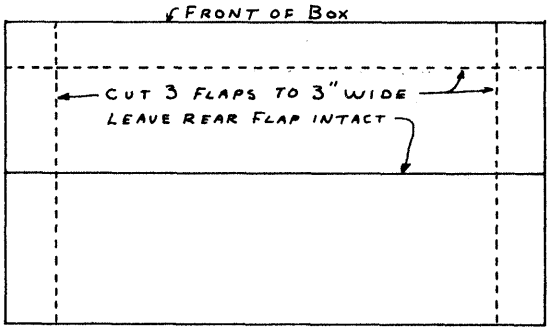
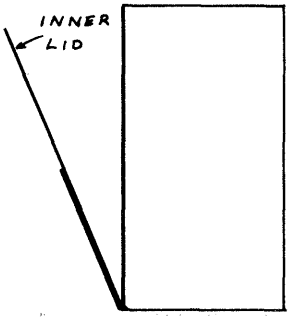


FIG. 5



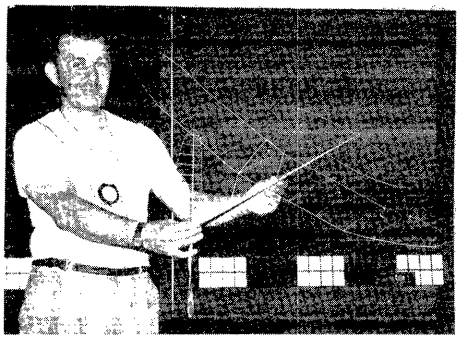
TOP VIEW (CLOSED)

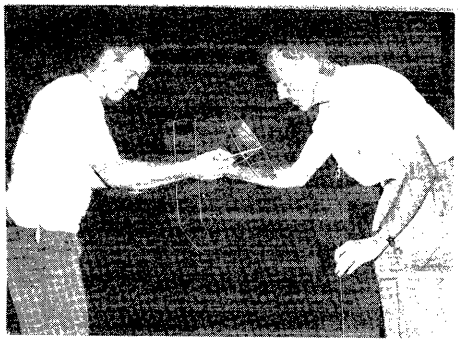
FIG. 3

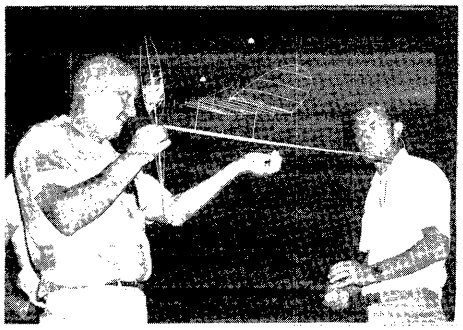


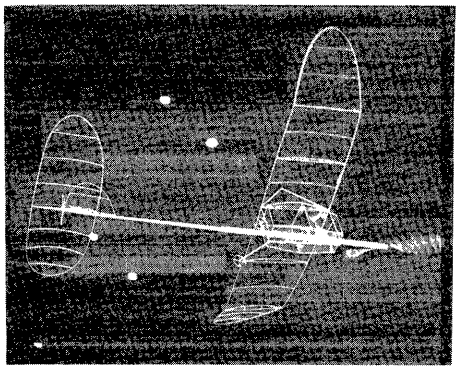
END VIEW (PARTIALLY OPEN)

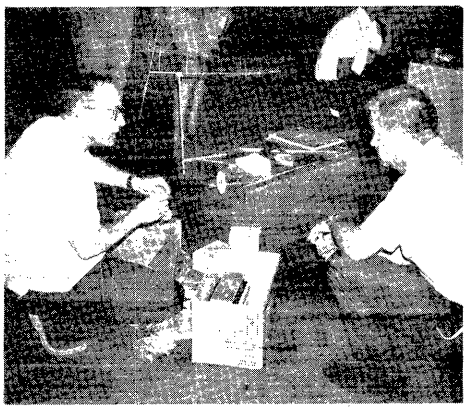
FIG. 4

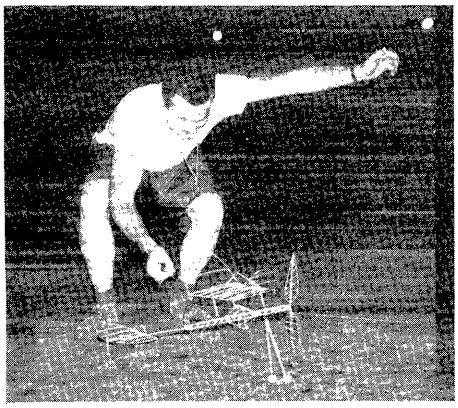


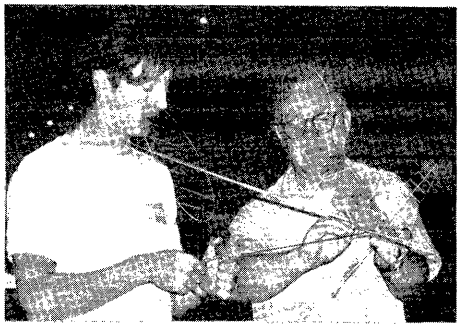


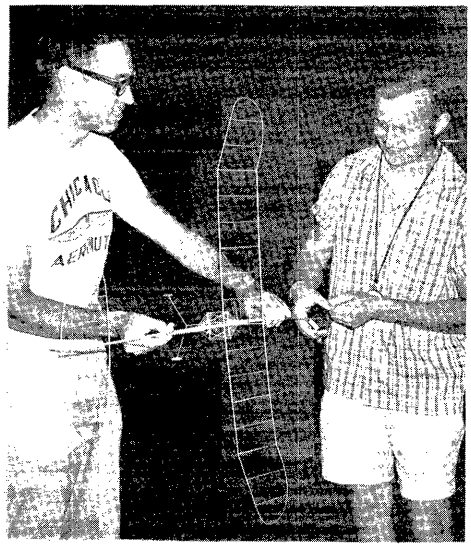


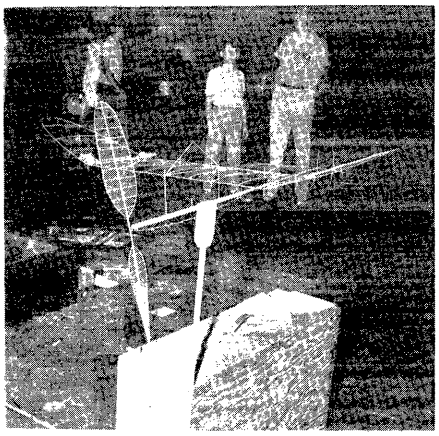






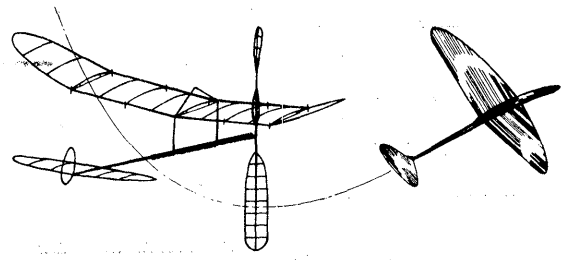






The Voice of N.I.M.A.S. SEP · 1969

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

Dick Black Memorials

In Jan. '69 it was announced that two Dick Black Memorial Lectures were ready for circulation. Since that time numerous clubs and individuals have viewed them and expressed satisfaction with the content. Both lectures are available on this basis: Schedule your showing as far in advance as possible and reserve the lectures by sending your request to Box 545, Richardson, Tex. 75080. In most cases it is possible to meet your schedule and they will be sent in time for the meeting. In return, the user must reimburse NIMAS for postage costs and return the lectures by First Class mail.

These first two lectures deal with pouring microfilm and cutting and selection of balsa wood. Numerous others are planned on topics such as covering and patching with microfilm and condenser paper, indoor construction techniques, model boxes, rubber stripping, winding rubber, use of torque meters and wire bending. Any color slides you may have on any of these topics will help get more lecture packets on the road!

These lectures were established as a fitting memorial in remembrance of Dick Black. Dick was an early member of NIMAS and co-founder of NFFS, and contributed mightily to both organizations and to model building in general. His time was spent in helping others to learn how to build or to improve their building and flying skills, so these lectures carry on his work in his name.

FAI Benefit Meets!

Clarence Mather (team selection program manager) had the idea that indoor meets could award nominal prizes and donate extra entry fees to the Inboard Travel Fund which helps the team pay stateside travel expenses. This idea was taken one step further by Murray Frank (Contest Coordinator for Dist. VIII) and Sam Casey of Wichita Falls, Texas. They held two outdoor FF meets last summer and donated a total of $61 to the Indoor travel fund. Thanks for the effort and the thought, Murray and Sam!

Meanwhile, it is not too late if you wish to hold an FAI benefit meet of your own - right up until the team is ready to leave early in April (see FAI Report). Prizes for these meets have varied from NIMAS Certificates to homemade trophies, and a few of the special NIMAS trophy "makings" (see Jan. '69 INAV) are available for this purpose at 55¢ each plus postage costs.

Top Ten Easy B

Bob Putman, manager of the annual NIMAS Postal Meets, has suggested that the results of the 1969 Postal be used to establish the Top Ten Easy B fliers. The list would be started all over again with each Postal, but fliers could submit new times during the year and "bump" their way to a higher place on the listing.

This sounds like a fine idea, so here is how it will work: The rules will be the same as for the Postal, except all flights will be "fudged" to 35' ceiling for the sake of uniformity. Send times to: Bob Putman, 507 Darlene, Arlington, Tex. 76012. A monthly announcement will be made of the Top Ten as changes occur. The rules are:

1. All pertinent AMA rules shall apply, except that FAI ceiling measure shall be used.
2. Easy B models shall conform to AMA rules, except limited to paper covering only.
3. No entry fee required, open to all fliers.
4. Include ceiling height with flight time.

Top Ten (taken from '69 Postal times and fudged to 35')

		Time/ceiling	Fudge	Adj. Time
1.	Clarence Mather	590/30'	1.08	637
2.	Joe Pontecorvo	516/24'	1.21	623
3.	Pete Patterson	492/24'	1.21	594
4.	Jim Walters	392/24'	1.21	473
5.	Howard Haupt	384/25'	1.18	454
6.	Phil Hainer	383/25'	1.18	453
7.	Joe Deady	367/24'	1.21	443
8.	Rex Powell	395/31'	1.06	420
9.	R. J. Dunham	453/41'	.92	418
10.	Fudo Takagi	352/25'	1.18	416

Top Juniors

1.	R. J. Dunham II	467/41'	.92	431
2.	Kim Mather	255/25'	1.18	302
3.	Neal Rozelle	287/35'	1.0	287

FAI INDOOR REPORT

Team Manager Named

Joe Bilgri has been chosen as Manager for the 1970 U. S. Indoor Team. Joe has ample experience in this job, having been a team member in 1961 and 1966 and manager in 1962.

1970 Indoor World Championship

Romania has announced that They "agree in principle to organize the next World Indoor Aeromodelling Championships at the beginning of April 1970 in the salt mine of Salanic Prahova." This early date was doubtless chosen because humidity builds to high levels in the mine later in the year.

CONTEST CALENDAR

MARYLAND - Silver Spring. Indoor sessions at JFK High School, 1901 Randolph Rd., Silver Spring. Sept. 26; Oct. 10, 31; Nov. 7, 21; Dec. 5, 12, 1969 and Jan. 9, 16, 30; Feb. 20, 1970. Time: 7 pm to 11 pm.

NEW JERSEY - Lakehurst. Indoor flying at Hangar #5 on Sept. 21 and Oct. 5, 1969. Check with C. V. Russo, 143 Willow Way, Clark, N. J. 07066 for times and details.

NEW YORK - Hicksville, L. I. Cat. II indoor contest at Cantiague Park, Hicksville, L. I., N. Y. Sept. 28, 1969. Site is 190' dia. dome, 50' high. HLG, Easy B, Indoor Stick, Paper Stick, Scale. CD - Bill Dunwoody, 985 Ft. Salonga Rd., Northport, L. I., N. Y.

VIRGINIA - Hampton. Record Trials/FAI Benefit meet. CD Hal Crane, 4002 Buchanan Dr., Hampton, 23369 ph. 723-0861. Call Hal to confirm schedule.

NATS INDOOR SCALE RESULTS

NFFS sponsored events:

Navy Scale	Jr-Sr. Peanut Scale	Open Peanut Scale
1. Dave Stott	1. Paul Stott (Jr.)	1. Ralph Kuenz
2. Bob Thompson	2. Dale Hacker (Sr.)	2. M. Richardson
		3. Don Garofalow
		4. Dave Stott
		5. Fred Weitzel

AMA Scale:

Junior	Senior	Open
1. Brian Webster	1. Terry Kuehne	1. Walter Eggert
2. Michael Kuehne	2. Mike Thompson	2. Jim Richmond
3. Justin Mills	3. Denny Dock	3. Dave Stott
4. Bruce Pailet		4. Andrew MacIsaac
5. Barry Pailet		5. Don Garofalow

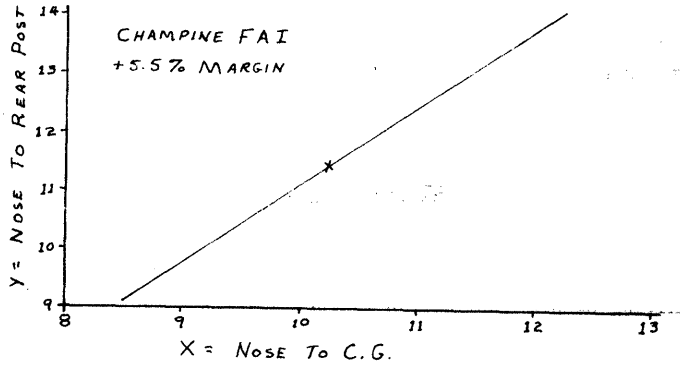
Walt Eggert's Pietenpol was awarded the highest scale points - 87. It was beautiful, with sprayed dope finish, excellent engine details complete with spark plugs and ignition wiring and permanent interior details - pedals, stick, seats, etc. The rubber motor passed through a hole in the back of the seat.

Second place winner Jim Richmond had a well made Pilatus Porter (an excellent model but very little scale detail) that kept the old controversy alive - scale vs. flying - Jim's model scored low in scale points but tops in flying. Walt Eggert's model made only 59 seconds in flying, but this was still a darn good flight. (Comments by Paul Kastory.)

Pictures from all three events are on page 5, as taken by Tom Vallee and Bob Clemens. They are numbered vertically in columns; captions below the pix.

STATE OF THE ART

The model of the month is Bob Champine's FAI which set the FAI Cat. I FAI record of 18:27 on March 5, 1969 at the Willis School in Hampton, Va. The site is 20' high with a smooth ceiling (lights almost flush) and high times make ceiling scrubbing necessary. The model has a built-up boom, removable monowire fuselage brace and adjustable incidence stabilizer. Note also that although the general design layout resembles Richmond's models, wing offset has been increased and stab is offset, all to improve the off-the-wall recovery ability which helps a lot when the site is as small and narrow as Willis is. The graph below is a margin of stability plot for this model; this service will be presented whenever possible for stick models in this column.



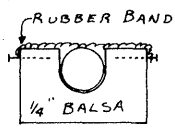


FIG. 1

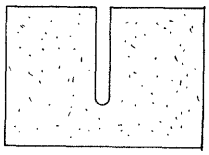


FIG. 2

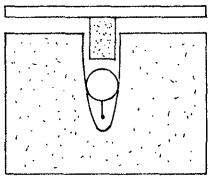


FIG. 3

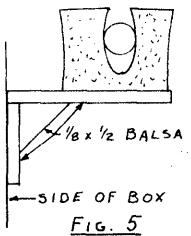


FIG. 5

MODEL STORAGE AND TRANSPORTATION

Part III - Model Arrangement And Mounting

It is also important that your mounting fixtures hold the model parts firmly without damaging them; but if the fixtures are so tight that you have to force the parts out, you may break them. I once made the mistake of using all-balsa fuselage holddowns (Fig. 1) with rubber bands across the top. In high humidity, the balsa block swelled up and the motor stick softened, thus giving a permanent crease in the top of the stick.

The best material noted so far for mounting model is foam rubber of the type sold for packing and for seat cushions. It can be cut with a sharp knife by successive slicing motions, or on a bandsaw if you cut slowly to avoid heat build-up or snagging. Large chunks can be cut into blocks, and the material is often available in thin sheets that cut nicely with scissors.

Motor sticks can be mounted in a foam block of the type shown in Fig. 2, where a narrow slot is expanded to fit the stick. An alternate arrangement is shown in Fig. 3, where a piece of balsa and a small foam block holds the stick in a wider slot. Fig. 5 is a balsa and foam bracket for mounting on the side of a box; it takes a little bit of experimentation to get the dimensions right to hold the stick firmly, but not too tight. Fig. 6 shows an ideal way to hold props, using foam blocks with slits cut in at the proper spacing.

Wings are a special problem to mount, since they are so long and especially fragile compared to their size. The best way to support the wing is by the posts, just as on the model, since the wing is designed to transfer all stress to those wing posts. This calls for a fixture like the one in Fig. 7 made from balsa and standard tissue sockets. If you brace the wing on demountable jigs (see Oct. '66 INAV) as I do, the wing stays with the same jig from the time of bracing until its demise.

Now that you have fixtures to mount the model, plan the arrangement within the box. Fig. 8 is reprinted from last month, with sway braces added; while Fig. 9 shows how models may be arranged to fit in a fairly narrow box, with box width limited by stab length. Figs. 8 & 9 are scale drawings of Richmond's model (chosen because of its long stab and long fuselage) in two "minimum size" boxes. Fig. 8 is a 30" x 13" x 15" ready-made storage box such as can be obtained from Sears, and Fig. 9 is a "scratch-built" box 9" x 17" x 30". The width can be reduced to about 1⅛" more than the stab length, down to a 12" stab. Note that the models in Fig. 9 are mounted with wings high on the center web, with the fuselages low so the stabs clear the wing tips.

Sway braces, shown in Fig. 8, are a good idea anytime a part can rotate or swing to hit another part. In Fig. 8 they serve to prevent fuselage rotation which could put a stab tip through the wing. Sway braces are most often needed at wing tips, since wings tend to move more than other parts.

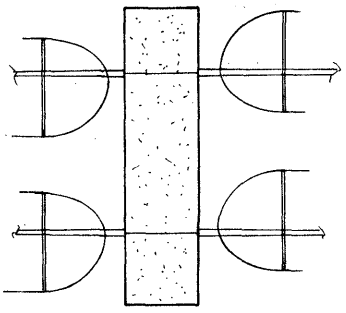


FIG. 6

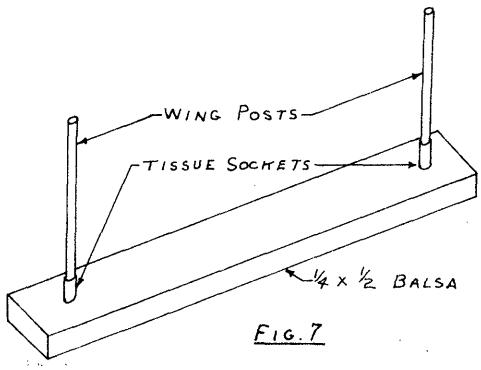
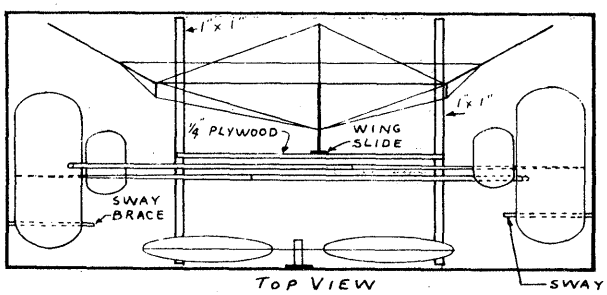


FIG. 7



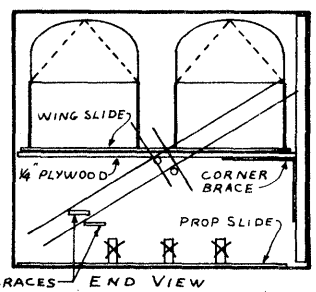


FIG. 8

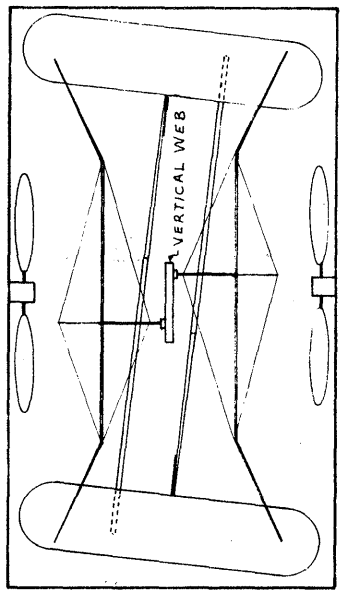
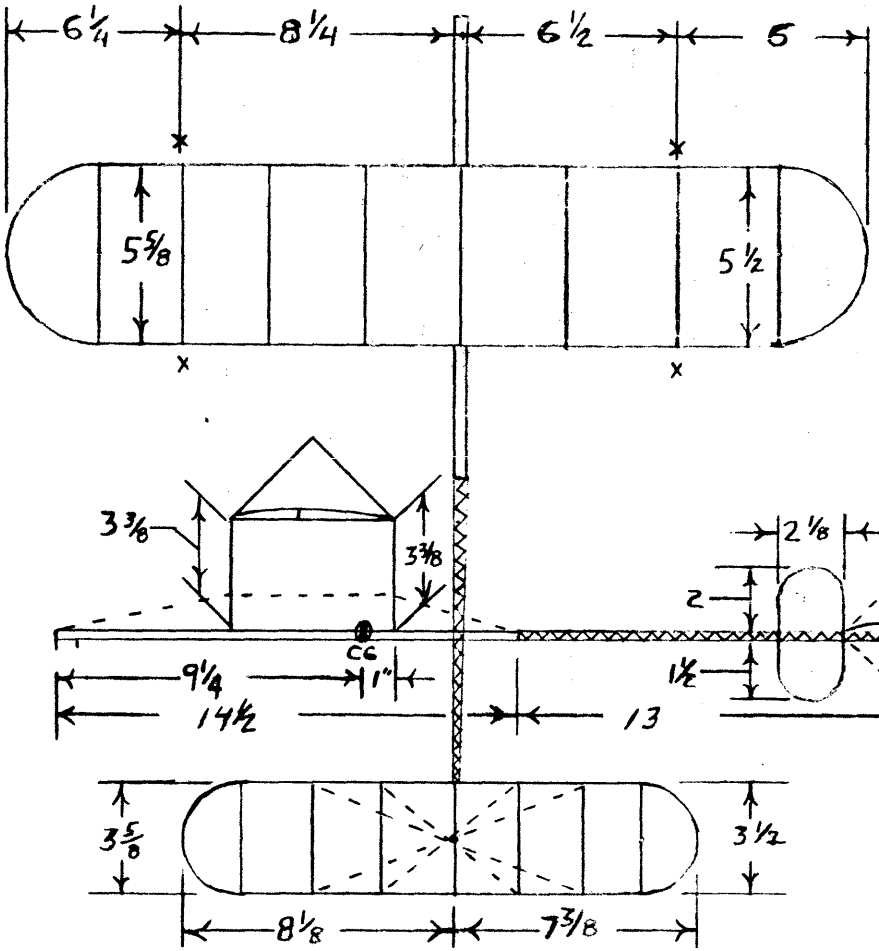
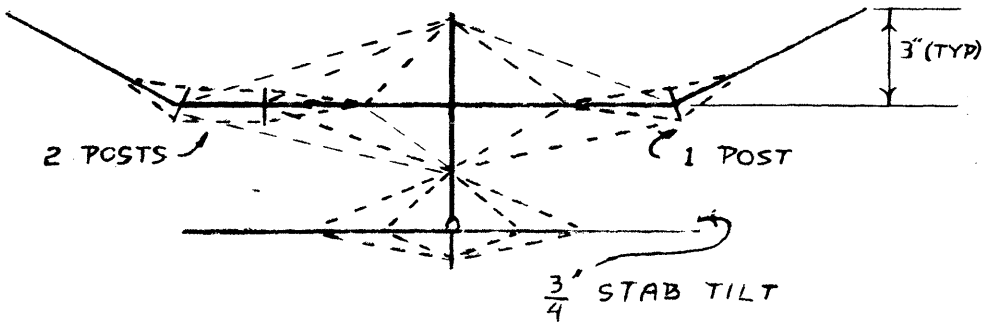


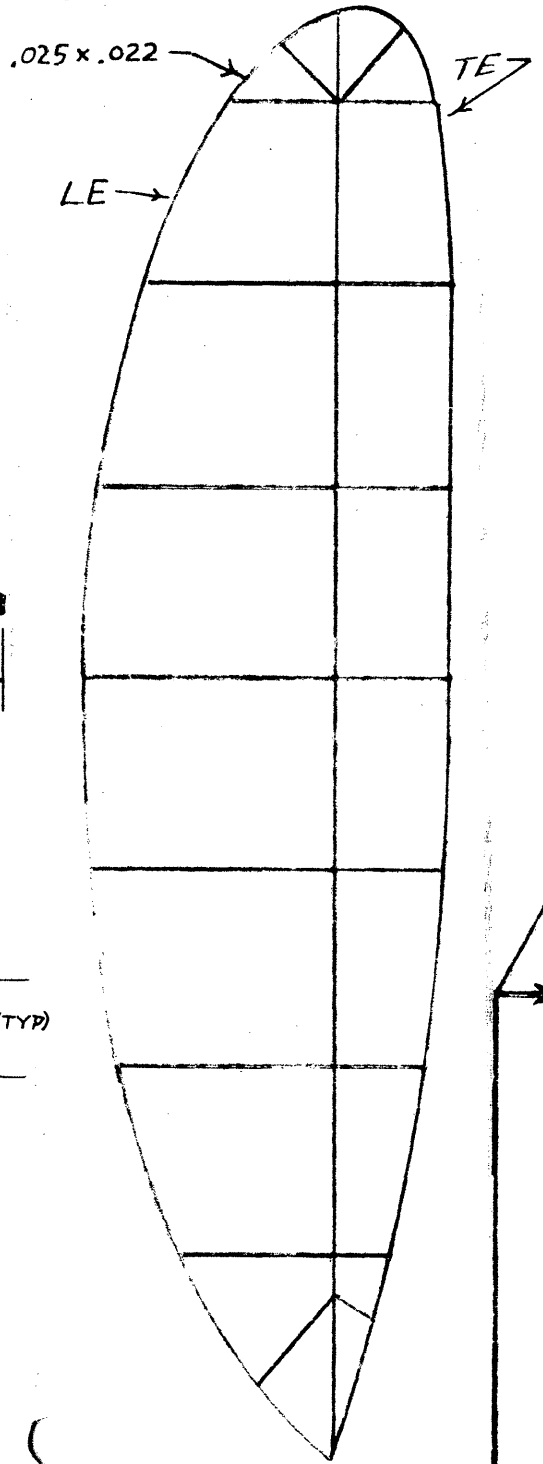
FIG. 9

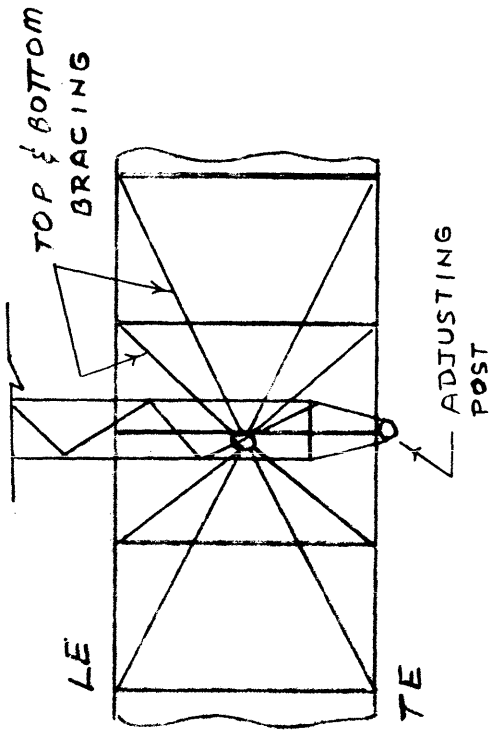
CHAMPINE FAI
18:27 CAT. I

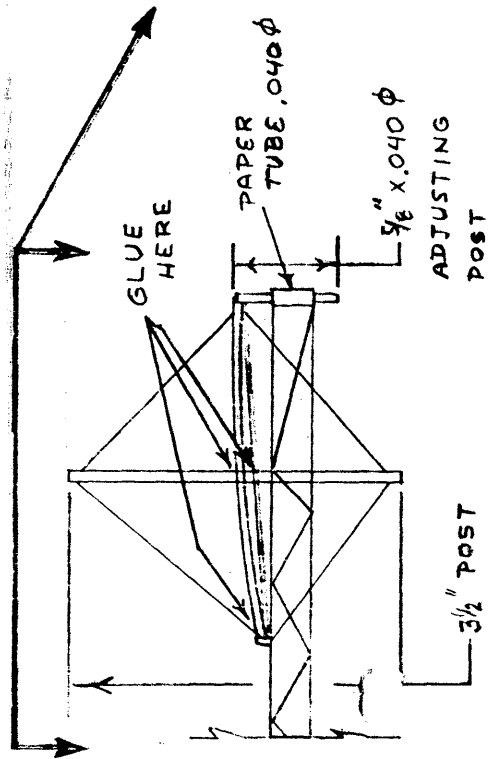




REAR VIEW







NOTES:

F/D – 36"/16½" TOTAL A.T. – .033 OZ

12" LO[illegible] .050 RUBBER – .025 OZ

LAUNCH TORQUE ≈ .2 IN-OZ

MODEL STORAGE AND TRANSPORTATION

Part IV - Box Construction

Part I of this series (Apr. '69 INAV) dealt with basic box construction factors such as finish, seal and waterproofing, so these will not be repeated.

Three basic materials are usually used for indoor boxes - styrofoam, cardboard and wood; these materials may be combined in some cases. Fig. 1 below is reprinted from Jan '66 INAV - a styrofoam box built by George Bucic of the Chicago Aeronuts. This box has two minor disadvantages - it is light enough to be tumbled by a wind (but oh-so-easy to carry!), and is white inside. If you can find dark colored material, it would be ideal. George cut 4' x 8' sheets of 1/2" styrofoam with a razor knife and a straightedge to form the box: it was assembled with white glue. The box was assembled, finished on the outside with water soluble wood filler and topped with water-base paint. The doors were then cut loose and seal strips, drawers and model hangers installed inside; fastening hardware and a handle finished off the outside.

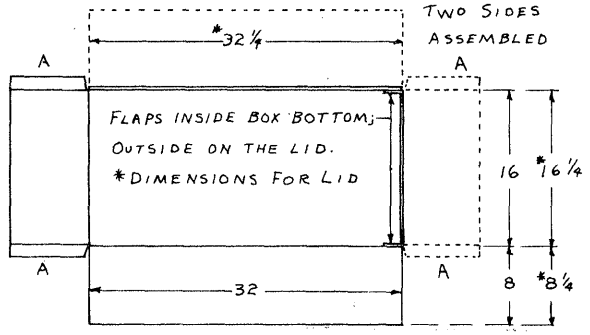
Perhaps the most common box material is cardboard - it is easy to work and readily available. Cardboard boxes have an inherent advantage if you plan ahead - limit their contents to two models of similar size such as two FAI's or two paper stick models. "Specialty" models such as A ROG, helicopter or ornithopter should be planned one to a box, but if you have several of one type like FAI, you may be better off with a larger multiple box like the one to be presented in Part V. The advantage of limiting models to two per box is that the boxes remain reasonably small, thus easy to store and carry. You seldom need more than two models for small contests, so this may be your best choice unless you do a lot of flying.

The best design for a cardboard box is to have the lid slip over the bottom, with the lid full depth. Both the lid and bottom are made the same way, in the style shown in Fig. 2. The corner reinforcement flaps (A) are bent to fit inside the bottom, and outside the top piece. These flaps can be omitted for the bottom piece, if the corners are reinforced with wood as shown in Fig. 3. You can also omit them on the lid by substituting a strong cloth-based tape at the corners, but this arrangement tends to loosen with age.

Two precautions are mandatory with this construction. The first is to use extreme care in layout, paying close attention to making exact right angles and correct dimensions. The second is to increase the size of the lid by exactly two thicknesses of cardboard, so it will slip over the bottom "just right". It is also important to make accurate cuts with a sharp knife, using a straightedge for a guide. Make two cuts - a light one just through the surface of the cardboard, and then finish the cut. Score the cardboard along the folded lines to insure that the cardboard bends on the lines. Use a rounded object to score along the lines, and try to avoid cutting the top surface of the cardboard. It is often helpful to use a straightedge to assist in making the bends - added insurance!

Clarence Mather designed a box using cardboard with wood reinforcing strips, as shown in Fig. 4. Clarence got his cardboard from refrigerator cartons, while the wood reinforcing strips were cut from 1" x 1" stock on a bench saw. The wood should be left at least 3/8" thick to prevent warps. The cardboard is tacked and glued all along its length during assembly, then the entire box can be finished in the usual manner.

The remaining box material is wood, and numerous hints for this construction will be found in Part V, where Al Rohrbaugh's box design will be covered. This box carried 10 complete FAI models to Rome, yet it is only 28½" tall, 32½" long and 17" wide.



LAYOUT FOR 8" x 16" x 32" BOX

FIG. 2

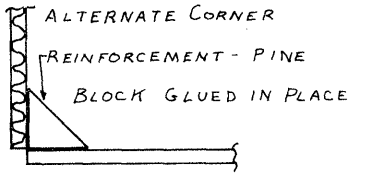


FIG. 3

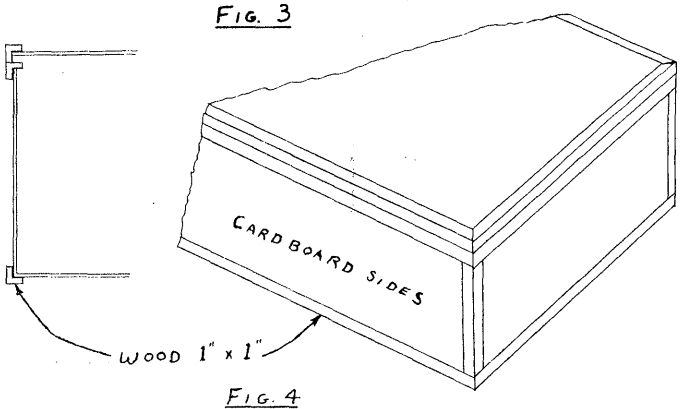


FIG. 4

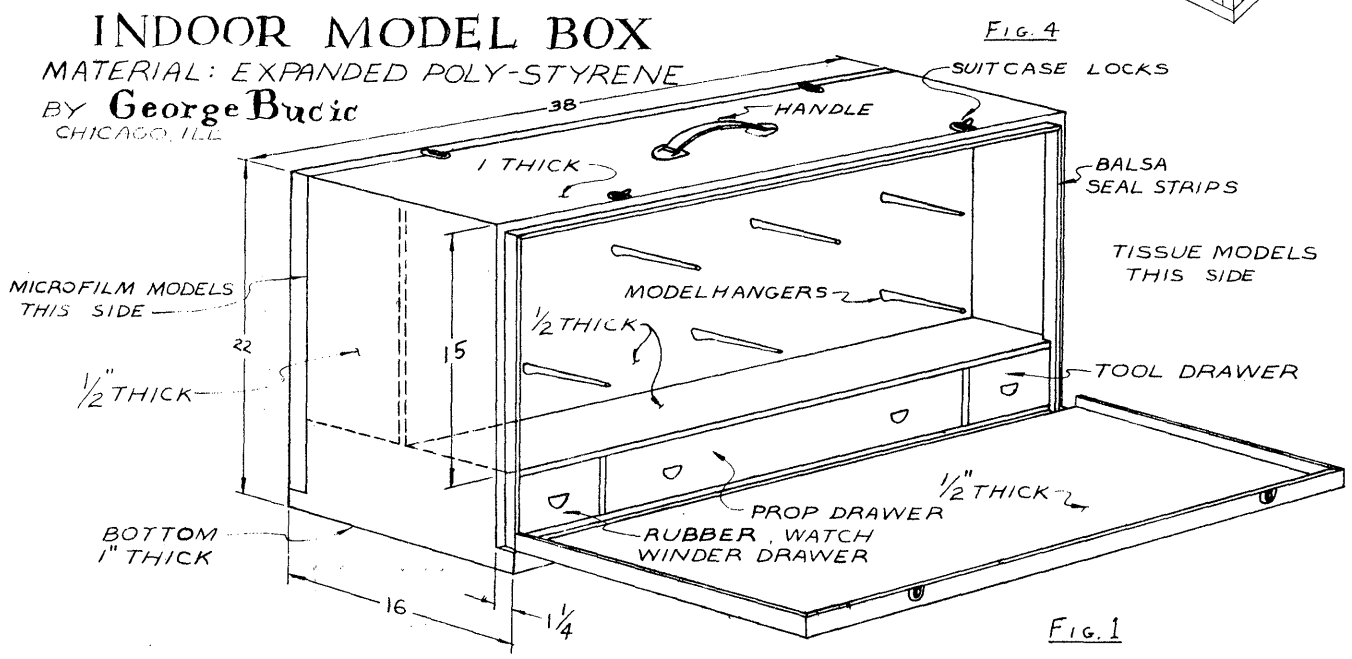
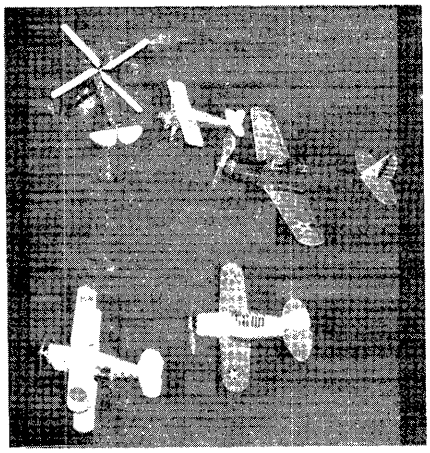
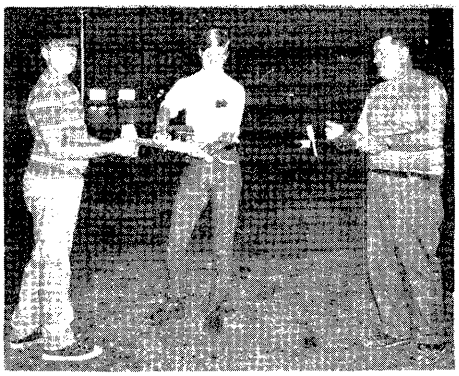
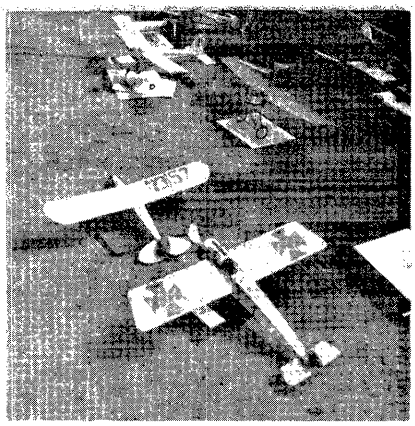
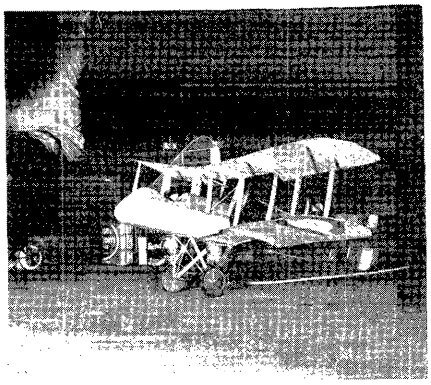


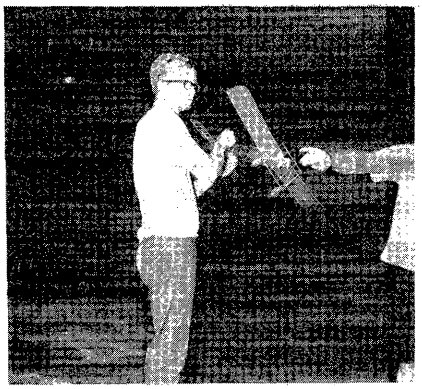
FIG. 1

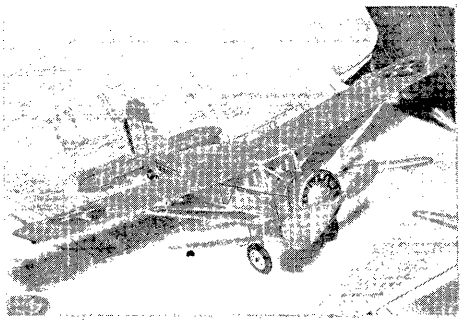


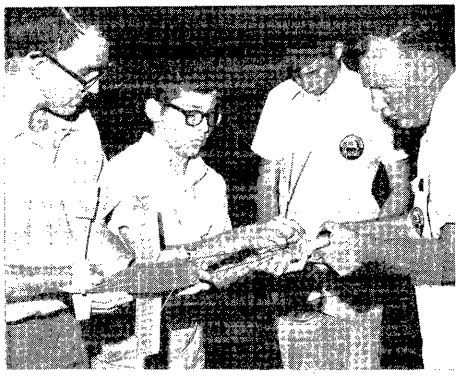


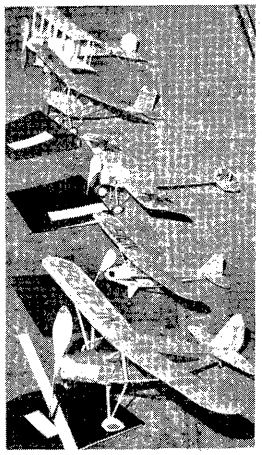


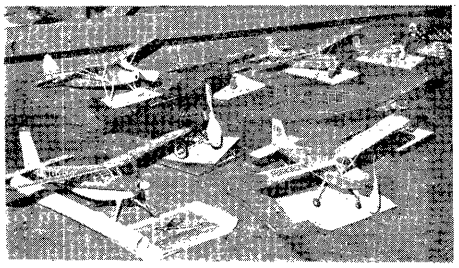


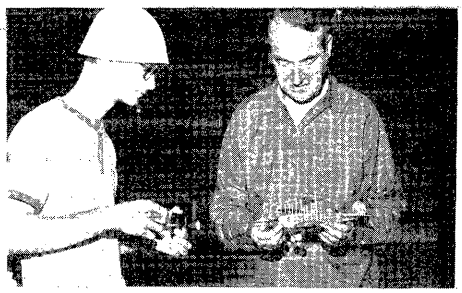












Left Column

1. Autogyro, 3 Peanut entries, PT-19. Gyro flew well except for straight flight into wall. (Clemens)
2. Unidentified model - may be Peanut Scale entry.
3. Bill Hannan's Bellanca Skyrocket (Peanut). Proxy by Tom Stark. (Clemens)
4. AMA Scale entries await judging. (Clemens)

Center Column

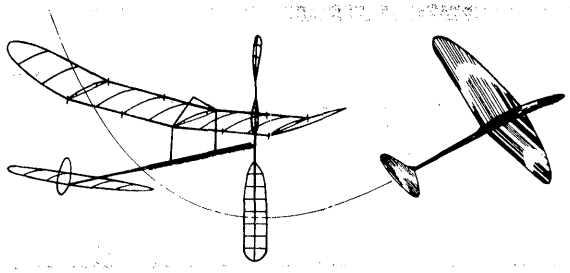
1. Pietenpol Air Camper held by Phill Lawry. Model may be 1st place AMA winner by Walter Eggert. (Clemens)
2. Scale model by Bucky Serviates.
3. Neemith Cougar (Peanut) by Martin Richardson (on left). Prop driven by 3 geared motors. Second place in Open Peanut Scale. (Clemens)
4. Wright Flier gets windup. (Clemens)

Right Column

1. More scale models await judging.
2. Ed Franklin and his scale entry.
3. More AMA Scale entries!

The Voice of N.I.M.A.S. OCT·1969

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

ROBERT A. NELSON, 483 Manchester Rd., Yorktown Hts., N. Y. 10598

Change of Address

Please note the following address changes:

Bill Hannan (GRAPHICS)
P. O. Box A
Escondido, Cal. 92025

Chester Wrzos
Box 517, Rt. 3
Madison Hts., Va. 24572

Just a reminder: Any NIMAS members who move and want their new address to appear in INAV need only ask when they notify us of their new address.

Special Action Committee

Roger Schroeder, S.A.C. Chairman, has announced that help is now available to beginners who wish to learn to build indoor models. Those who know of such youngsters should help them contact Roger at 4111 W. 98 St., Overland Park, Kan. 66207. Anyone wishing to help as an instructor in the effort should also contact Roger.

Top Ten Easy B

No times have been submitted this month to vary the Top Ten standings. One flier noted that the model specs should be better defined regarding solid construction and bracing. So be it! The basic Easy B concept has always been solid motor stick and boom, with unbraced surfaces. Let your conscience be your guide, and we'll hold the meet according to that concept - it's all for fun anyway!

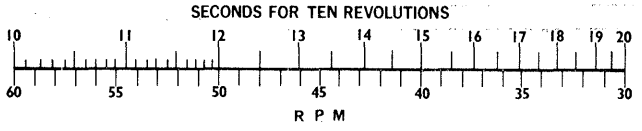
Who Is Flying Where?

Gene Meneghini, 1214 E. 169th St., Cleveland, O. 44110 asks "Where is anyone flying in the Cleveland area?" If you have a site near Gene, drop him a line!

It would be a "good turn" for any groups in NIMASland to make known their flying schedules - just drop a line to Box 545, Richardson, Tex. 75080 and the info will be listed in Contest Calendar. This offer is not restricted to NIMAS members!

New NIMAS Chart

A new NIMAS Chart, designed by Erwin Rodemsky, is now available for 65¢. The chart, shown below, is 5½" long and just over 1" wide. For higher RPM's, double the time measured for ten revolutions, and double the RPM figure.



New Materials!

Several fliers have used Micro-Lite covering material, a plastic film lighter than condenser paper and sold by Micro-X. The same manufacturer has produced an even thinner film. Their brand name is Kimfol, and the new thickness is .00008" - only 8 times as thick as blue microfilm. The weight of this film is about half the weight of standard condenser paper - .0056 oz/100 sq. in. They also make an aluminized film which weighs just over .008 oz./100 sq. in. The plain Kimfol shows obvious static problems not shared by the aluminized version. For more info, contact Mr. M. J. Becker, Peter J. Schweitzer Div., Kimberly-Clark Corporation, 261 Madison Ave., New York, N. Y. 10016.

Contest Board Action

All the paperwork has caught up, and AMA HQ has announced the FFCB action (during the Nats) which ruled Bob Randolph's cabin model ineligible. The trophy entanglement is being straightened out and Warren Williams has been acknowledged as 5th place winner in Open Cabin.

NIMAS Services

The following forms are available at cost (approx. 5¢ per sheet): layout sheets for Velocity Focusing prop design (See Mar. & May '68 INAV) and calculation sheets for stability margin design (see Jan. '69 INAV). In addition there is a prop design packet which summarizes prop info in general from past issues of INAV. Request info from Box 545, Richardson, Tex. 75080.

NIMAS Member Honored

Dr. Richard Ganslen, better known as Dick to all his modeling friends, was recently named to the Helms Hall Of Fame. This honor normally applies to track and field athletes, but Dick was honored for his scientific research in track and field athletics. His book on pole vaulting is a classic text on the subject, and his other research includes wind tunnel tests and computer analysis of discus and javelin flight.

Sites!

Several years ago Richard Miller started collecting info about various big hangars, and bemoaning the loss of hangars which were no longer available. In the same vein, John Thornhill sent me an advertisement showing how Bethlehem Steel helped install a roof inside the 190' hangar at Elizabeth City, N. J. This left 300,000 sq. ft. of space with 24' ceiling below the "roof" and a maze of hundreds of cables above the 24' deck. Instant Cat. I!

Then there is the new American Airlines hangar in Tulsa - 112' ceiling and 156,000 sq. ft. It is new, and will be used for maintenance of Boeing 747's. This makes it unlikely that it will be available for model flying - but it is a nice pipe dream!

On the other side of the coin, members of the D. C. Maxecutors credit John Sites with obtaining the use of Cole Fieldhouse at the University of Maryland for their Sept. 7 contest. The building was excellent, with low drift and high times. Better yet, things worked out so well that the meet may become an annual affair!

POSSIBLE WORLD RECORD

Word has been received that Jiri Kalina has submitted his recent 21:06 flight for consideration as a new Cat. I World Record. No information is available at present on his model or site.

INTERNATIONAL CONTESTS

On Aug. 2-3, the Hadju-Cup contest was held in Debrecen, Hungary. This was an international contest for individual entry only (no teams). 24 contestants came from Czechoslovakia, Romania, Poland, Italy and Hungary; the meet also served as the final round of team selection for the Hungarian 1970 Indoor Team. The team will consist of Andras Ree, G. Buzady and Antol Egri. The results:

1.	E. Chlubny	Czech	32:02	33:29	65:31
2.	J. Kalina	Czech	28:52	30:23	59:15
3.	A. Ree	Hungary	29:15	28:53	58:08
4.	G. Varszegi	Hungary	28:09	27:09	55:18
5.	G. Buzady	Hungary	28:11	26:57	55:08
6.	T. Wiegert	Czech	27:45	27:20	55:05
7.	A. Popa	Rumania	25:57	27:45	53:42
8.	A. Egri	Hungary	25:28	26:10	51:38
9.	J. Zolcer	Czech	24:43	24:14	48:57
10.	A. Soltesz	Hungary	22:36	25:36	48:12

Chlubny's 33:29 was a new site record (beating Hans Beck's 32:42 during the '66 W. Champs with a 90 cm model) and a new Czech Cat. III record.

On Aug. 9-10, Finnish 1970 Indoor Team was chosen in their 13 m site. Their times:

1.	Esko Hamalainen	21:23	19:37	41:00
2.	Pentti Nore	19:26	19:30	38:56
3.	Harri Raulio	18:24	20:16	38:40
4.	Harro Erofejeff	17:20	19:20	36:40

The first three fliers will be the team, while Harro Erofejeff will be their manager. The 21:23 by Hamalainen is a new Finnish Cat. II record.

STATE OF THE ART

The plan of the month is of Bobby Hanford's Cat. I Jr. HLG record model. In true modeling tradition, he bought wood and built the model the day before the meet - and set the record with it. This happened on the same day as Dick Mathis' 1:14.5 Cat. I record, and the site was the ballroom in Texas Woman's Univ. in Denton, Texas.

CONTEST CALENDAR

CALIFORNIA - Edwards AFB. Cat. II Record Trials, Nov. 9, 1969. Site either the C5A hangar or Weights & Balance hangar, depending upon availability. No special clearance needed for entry. Bob Gibbs, 5005 Halifax Circle, Cypress, Cal. 90630

MARYLAND - Silver Spring. Indoor sessions at JFK High School, 1901 Randolph Rd., Silver Spring. Oct. 31; Nov. 7, 21; Dec. 5, 12, 1969 and Jan. 9, 16, 30; Feb. 20 1970. Time: 7 pm to 11 pm.

WISCONSIN - Milwaukee. Indoor sessions each Thursday from 7:30 pm to 9:30 pm at Sherman Social Center, North 51st St. and W. Locust St. Ken Kraemer, 3945 N. 41st St., Milwaukee, Wisc. 53216, ph. 414-442-5864.

THE EASTERN INDOOR CHAMPIONSHIPS

This contest was held early enough to insure good air, in what proved to be an excellent site. It was the result of a lot of hard work by the D. C. Maxecutors, backed up by president John Sites' efforts to get the site and to get excellent publicity for the event. If they are able to make this an annual affair, it could work into one of the major indoor contests in the country. Good Work!

Junior HLG		Sr.-Open HLG	
1. David Oickle	66.8	1. Dan Belieff	122.0
2. Richard Persch	57.2	2. Bob Sifleet	102.0
3. Bruce Pailet	53.1	3. John Sites	94.0
Jr.-Sr. Paper Stick		**Open Paper Stick**	
1. Bruce Pailet	7:00	1. Bob Platt	14:37.5
2. Barry Pailet	5:09	2. Hal Crane	14:20.4
Jr. Easy B		**Sr.-Open Easy B**	
1. Bruce Pailet	5:47	1. Bob Platt	11:37
2. Barry Pailet	5:20	2. Tom Vallee	10:32.5
Indoor Stick		**Indoor Scale**	
1. Dan Belieff	24:07.6	1. S. Rolpe Gregory	96½
2. Hal Crane	21:43.2	2. R. Aubschun	87½
Unorthodox Aircraft			
1. Tom Vallee	77 pts.		
2. Jerry Weir	72 pts.		

A NICE TOUCH

When one looks back at a World Championship, the big show and excitement is not all that comes to mind. Without fail, European hosts make a special effort at small special touches. A sterling example is shown below - it was the place marker for Jim Richmond's plate at the Victory Banquet at the Rome Champs. Each flier received one, and some also received a cartoon depicting some facet of the contest activity. The cartoonist was one of the host group, and obviously enjoyed his sketching.

HINTS AND KINKS

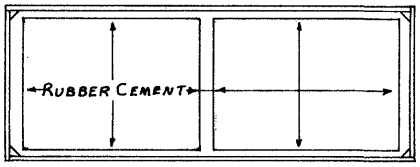
Microfilm Patching

Bob Randolph suggests that silver film can be used to patch with if the patches are made using very soft tissues such as Lady Scott brand. Put the film between two layers of tissue to cut it to size, peel off one side and apply the patch dry, then peel off the second tissue. By using such soft tissue, the film is not damaged, and the porous grain of the paper keeps the film from adhering to the paper.

Bob Dunham used to have trouble getting patching film to release from the paper carrier. Now he holds the patch at arm's length and sprays a short burst of Krylon spray adhesive toward it. Only a few tiny droplets of adhesive are needed on the patch to insure that the patch stays on on the model instead of on the paper, and the weight added is negligible. A caution from Jody: Be sure that none of the spray adhesive drifts onto other objects like the furniture or other valuable things - it remains sticky! Let me hasten to add that it hasn't happened here; she thought of it in advance!

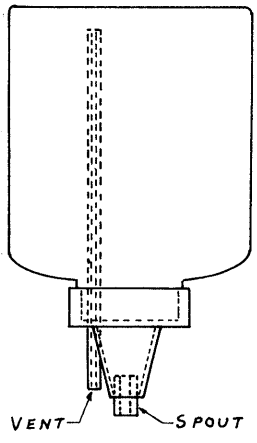
After Bob made the suggestion above, I tried the same thing, except I used tiny drops of water put in place with a soft brush. This also works well. In most cases, film that is not sticky will require that the edges of the patch be sealed down with water. In this case, the best type of paper carrier is a paper which is rough textured like newspaper, but it should not be as porous as newspaper. Thus, after the water droplets are put on the patch and the patch is placed on the model, water brushed along the edge of the patch does two things. It runs under the edge of the patch and adheres it to the model, and it also causes the paper to "pucker" and pull away from the patch so you can lift it off. Newspaper is porous so that the water soaks through the paper so quickly that the paper is stuck tightly to the patch - instant panic!

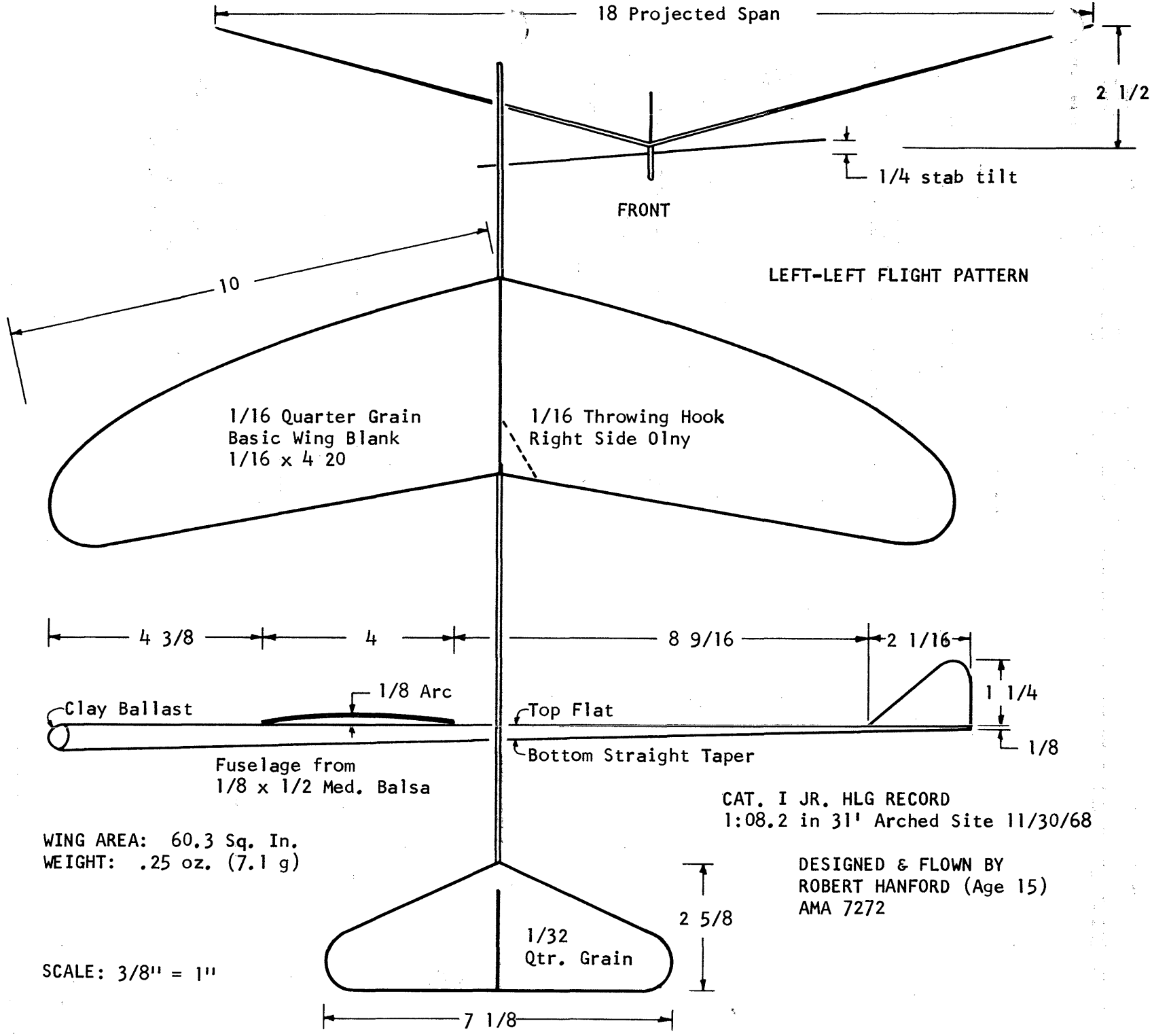
The process of making and storing patching material is speeded up by using rubber cement. Cut pieces of good bond paper to the largest size that will fit between the edges of the hoop (see sketch below), brush rubber cement along the edges of each piece, and lay the hoop on top of the paper. Make sure the film adheres to each piece of paper, then cut the sheets loose and store in a box. Use sharp scissors to cut patches to proper size and patch the model as discussed above.



Film Pouring Spout

Numerous pouring spouts have been designed to pour microfilm, and some sort of self-regulating spout is a big help in getting uniform sheets. Most spouts are used to merely distribute the film, and are therefore filled each time a sheet is poured. This exposes the film supply to evaporation and agitation several times during a pouring session. The spout below, designed by Erwin Rodemsky, is both pouring spout and storage container. To use it, you invert it while covering the spout with a finger. Move the finger during the pour, while the second tube serves as the vent. Cover the spout again with the finger to stop the pour. Rinse the spout with acetone after the pouring session and stopper both tubes to prevent evaporation of the solvents.





WING AREA: 60.3 Sq. In.
WEIGHT: .25 oz. (7.1 g)

SCALE: 3/8" = 1"

CAT. I JR. HLG RECORD
1:08.2 in 31' Arched Site 11/30/68

DESIGNED & FLOWN BY
ROBERT HANFORD (Age 15)
AMA 7272

Oct 69

MICROFILM TECHNIQUES

Barometric Pressure - Follow-Up

The Feb. '69 INAV introduced the concept that barometric pressure exerts a powerful influence on the results we get when we pour microfilm, while the March '69 issue followed up on this theme and clarified one method of judging when to plan to pour.

When these two articles are considered together, they discourage those who live at higher altitudes and imply that successful pouring is difficult or impossible if you live under lower pressure. Recent experiments show that this need not be true; all you have to do is to modify the solvent balance of your formula. The principle is shown below in the two formulas given. Formula I "quits" about 29.50 in. hg. pressure, while Formula II has worked well down to about 29.00 and shows signs of going lower.

Formula I	Formula II
34 cc SIG Lite-Cote Dope	34 cc SIG Lite-Cote Dope
2 cc N/C 2500*	2 cc N/C 2500*
13 cc Methyl Ethyl Keytone	10 cc M.E.K.
4.5 cc Butyl Acetate	6 cc Butyl Acetate
1 cc Amyl Acetate	1 cc Amyl Acetate

*N/C 2500 is my code for 2500 sec. viscosity nitrocellulose dissolved in 100% M.E.K. I did not keep a record of the ratio of solvent to solids, so the next batch of N/C 2500 will likely differ somewhat!

A note on the characteristics of the films made from the formulas above: This film is an offshoot of one used for some time, based on SIG Lite-Cote dope. The original mix proved to be somewhat fragile, and N/C 2500 was added to improve the strength. This film is ultra-dry - so much so that it is difficult to patch using the same material. It is also the most stable film I have used, and is almost completely static-free. I have not made tests to prove it, but film from this formula gives the impression of being lighter, color for color, than other formulas.

MODEL STORAGE AND TRANSPORTATION

Part V - High Density Packing

Whether your're enroute to the World Champs or to the local flying site, it is nice to be able to carry everything in one load. In fact, when you travel, it is almost mandatory that the models occupy only one hand! After all, there is a limit to how much "extra" the Team Manager can carry!

Consequently, it was with great delight that I saw the sketch for Al Rohrbaugh's model box which holds 10 models and offers good access to all of them. Figure 1 below shows the basic arrangement, with some models eliminated from the end view. Two major features of this box make the big difference in packing and accessibility: the center web which serves to mount everything except props (the props can be mounted on the bottom), and the two sliding doors which give access to both sides of the box.

After his return from Europe, Al had the following remarks about the box: "The enclosed construction details show that the box is relatively airtight. In spite of that, it started to rain as I left Ft. Wayne airport and I lost my nerve and taped the edges of the box. On the way back from Rome I didn't tape it and experienced no damage due to air leakage. I conducted an experiment by allowing airport personnel to handle the box with no supervision on five different airplanes on the return trip. Some wings were damaged by rotating slightly and hitting the stabs. A simple but tedious solution is to place sway braces at the dihedral joints, but the real solution is to handle the box yourself."

The box was constructed of 1/4" thick brown paneling finished on the outside. A single 4' x 8' piece furnishes sufficient material for one box of the size shown. Al's box is shellacked inside (two coats, sanded between), and this darkens the color of the material to provide the dark background so helpful for visibility as you pack and unpack the models.

Fig. 2 shows a side view of the box with one sliding door partially open. This also shows the wood molding which serves to seal the edges of the box. Note that the molding fastens to the box except for one edge, where it fastens to the door. The basic box has an internal frame which shows up in the sectional views; and other details of the construction are shown also.

This concept can be applied to designing boxes for any reasonable number of models by varying the 28½" dimension. My own box was 14½" in this dimension and held four models and seven props comfortably.

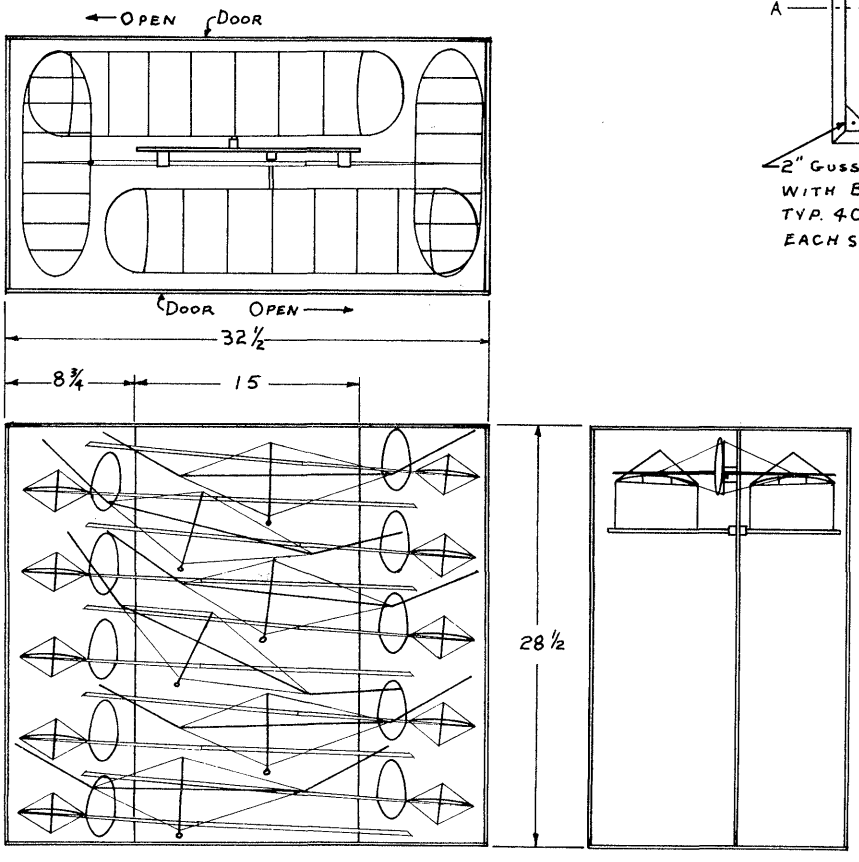


FIG. 1

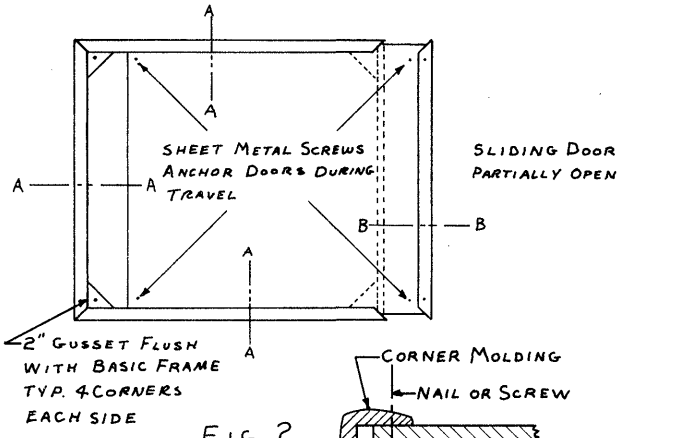
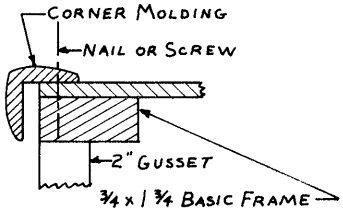
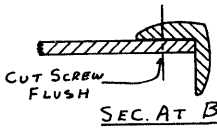


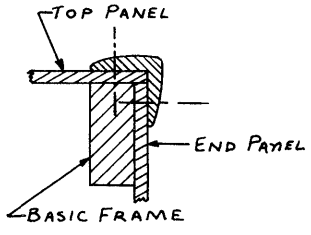
FIG. 2



TYP. SECT. AT A-A
(DOOR NOT SHOWN)



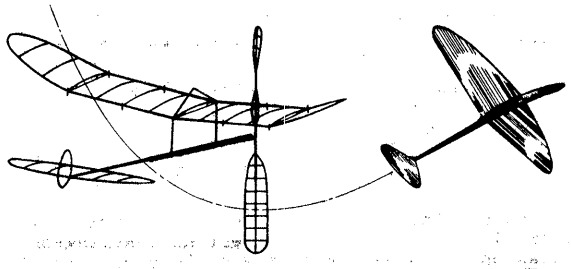
SEC. AT B-B



SECTION AT 4 CORNERS

The Voice of N.I.M.A.S. NOV · 1969

INDOOR NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

SPEEDIE N. McDOWELL, 205 N. 4th St., Champaign, Ill. 61820

Family Memberships

THOMAS J. SOVA, 977 E. Philadelphia Ave., Youngstown, O. 44502

Telephone Numbers?

A NIMAS member who travels a fair amount has suggested that a list of telephone numbers be compiled and furnished upon request to other NIMAS members. This could be a good idea, if enough people cared to participate to make a list of useful size. How about some comments on this? Most members manage to find out my number (235-4035) if they need to call me names - how about the rest of you?

Special Action Committee

Roger Schroeder, 4111 W. 98 St., Overland Park, Kan., 66207, announces that eleven local instructors from different parts of the country have agreed to help beginners in Indoor. If you need help or know someone who does, get the complete address of the nearest instructor from Roger.

Donald Sump	Lewiston, Idaho
Orval Stewart	Nashville, Tennessee
Charlie Sotich	Chicago, Illinois
Jim Richmond	Bensenville, Illinois
Chester Wrzos	Lynchburg, Virginia
Phill Lawry	Auburndale, Massachusetts
Bud Tenny, Box 545,	Richardson, Tex. 75080
John Thornhill	Mt. Airy, Maryland
Dave Linstrum	St. Louis, Missouri
Cy Baucke	Fullerton, California
Roger W. Schroeder	Holbrook, Nebraska

The rest of you look on the list and ask yourself if your name should appear there!

I Apologize!

Last month's issue announced a "new" and thinner version of the polycarbonate film which Micro-X sells as Microlite. Due to a mixup on my part, and confusing info furnished by the manufacturer, I really was talking about Microlite. Thus, the thinnest film available is Microlite and it has found good use in scale models and ornithopter wing flappers, to name two uses. Jerry Skrjanc (Micro-X) states that the static problem I mentioned clears up almost completely by exposing the sheet to moving air. He also says (I agree) that this is the lightest covering material available besides microfilm, with a weight about half-way between condenser paper and microfilm.

More Info Sheets

Some information sheets have been prepared on the constant margin of stability balance method. They summarize the CMOS method presented in the Jan. '69 INAV, in step-by-step example form. (The CMOS method of model balance enables flight characteristics to be duplicated more exactly from model to model than if a specified CG location is used.) These sheets are available by sending a stamped self addressed envelope with your request to: Box 545, Richardson, Tex. 75080.

Bilgri Reprints

Reprints of the three-part Bilgri indoor article from Model Airplane News are still available for 60¢ per set. These articles present a fairly complete picture of indoor construction and flying techniques and should be requested from Box 545, Richardson, Tex. 75080.

Financial Report

This issue is the first one of INAV's ninth year of publication. The average circulation for last year was 280 issues per month, which makes the second year that growth has amounted to a 12% increase. Income for the year amounted to $709.50 and total expenses for postage, office supplies and other supplies came to $682.38. Direct INAV costs break down as follows:

Printing INAV	$253.56
INAV Postage	205.18
Correspondence postage	99.10
Supplies	71.41
Other expenses	53.13
	$682.38

Each issue takes about 65 hours of time per month, counting the help of the whole family on mailing nights and all help donated by draftsmen and other contributors to the newsletter contents. Time spent in answering correspondence is in excess of the 65 hours, and outgoing mail totalled 1094 pieces. Incoming mail totalled 798 items.

World Championship Dates Set

In a recent letter, Otto Hints of Tirgu-Mures, Romania said that the 1970 World Champs has been scheduled for April 2-6, 1969. The site, as has been announced before, is the huge salt mine - Salanic Prahova. A sketch of the site appeared in the June '69 INAV.

SPECIAL INTERNATIONAL ISSUE

This issue is dedicated to indoor modelers all over the world. At the present time, INAV goes to Canada and Mexico and to 18 other countries, and we usually get some sort of report from each country periodically. I really appreciate this correspondence, and look forward eagerly to receiving each bit of news about indoor flying elsewhere in the world. Thanks to all of you!

TOP TEN EASY B

During the month of October, Bob Platt and Hal Crane "bumped" their way into the Top Ten. This is justice of a sort - they would have been there already, except for illness of the CD they flew under last spring. Their entry arrived late - unknown to them, and they thought they had placed. Anyone else who wishes to submit new times (even if they didn't enter originally) may do so between now and the next Annual NIMAS Postal. Deadline for listing in any issue is the last day of the previous month (deadline for Dec. '69 INAV is Nov. 30, 1969). In order to submit new times, fly your Easy B under AMA rules and send the flight time to Bob Putman, 507 Darlene, Arlington, Tex. 76012 before the end of the month. Please restrict model design to solid motor stick and boom with unbraced surfaces, and be sure to include the ceiling height (FAI measure) of your site when you send in the times. Current Top Ten:

		Time/ceiling	Fudge (to 35')	Score
1.	Bob Platt	575/20'	1.32	760.6
2.	Clarence Mather	590/30'	1.08	637
3.	Joe Pontecorvo	516/24'	1.21	623
4.	Pete Patterson	492/24'	1.21	594
5.	Hal Crane	415/20'	1.32	549
6.	Jim Walters	392/24'	1.21	473
7.	Howard Haupt	384/25'	1.18	454
8.	Phil Hainer	383/25'	1.18	453
9.	Joe Deady	367/24'	1.21	443
10.	Rex Powell	395/31'	1.06	420
Top Juniors				
1.	R. J. Dunham,Jr.	467/41'	.92	431
2.	Kim Mather	255/25'	1.18	302
3.	Neal Rozelle	287/35'	1.00	287

CONTEST CALENDAR

ARIZONA - Phoenix. Indoor sessions in Arcadia High School Gym, 7 pm to 10 pm the second Tuesday each month. Contact Terry Thorkildsen, 3103 W. Willow Ave., Phoenix, Arizona 85029 for further details. Cat. I site.

CALIFORNIA - San Francisco. Cat. II indoor contest, Dec. 13-14, 1969, 10 am to 4 pm each day; site is Cow Palace (96' ceiling). HLG, Paper Stick, Cabin, Indoor Stick (all with Jr.-Sr. comb and Open) FAI Stick - all ages combined.

All events flown both days. Bud Romak, 85 Sullivan Dr., Moraga, Cal. 94556 ph. 376-4624.

GEORGIA - Atlanta area. The Decatur Flying 8-Balls MAC 2nd Annual Indoor Contest, Nov. 23, 1969. Site is the Cumming High School Gym, a reasonably clear dome about 30' usable. Easy B and HLG (Jr. & Sr.-Op.); Paper Stick and Indoor Scale (all ages combined). Warren Lawrence, Box 225, Decatur, Ga. 30031.

ILLINOIS - Chicago. Cat. I indoor sessions at Girl's Gym of Forest View High School, 2121 Goebbert Rd., Arlington Hts., Ill. Sessions each Sunday from 9 am to 5 pm, except Dec. 7, Dec. 14, 1969 and Feb. 8, 1970. Call Al Sortwell at 312-439-1497 for directions to gym.

MARYLAND - Silver Spring. Indoor sessions at JFK High School, 1901 Randolph Rd., Silver Spring., Nov. 7, 21; Dec. 5, 12, 1969 and Jan. 9, 16, 30; Feb. 20, 1970. Time: 7 pm to 11pm.

MASSACHUSETTS - M. I. T. Cat. II indoor sessions at MIT Armory, Mass. Ave. & Vassar St., Cambridge, Mass., 3:30 pm to 6:30 pm, Nov. 15, Dec. 13, Jan. 31, Mar. 7. Indoor contest April 11, 1970, 1:30 pm to 8:30 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. ph. 358-4013.

NEW YORK - Hicksville. The Grumman Engineering Model Society is holding indoor sessions of the 1st & 3rd Wednesdays of each month, and welcome any and all indoor fliers. For more info, contact George Myers, 70 Froelich Farm Rd., Hicksville, N. Y. 11081.

OKLAHOMA - Tulsa. Tulsa Glue Dobbers indoor session, Nov. 23, noon to 6 pm, at the 15th St. Armory. Bob Dunham, 4730 S. Yorktown Ave., Tulsa 74105 ph. 918-RI 3-5424.

TEXAS - Garland. Class A indoor contest, Dec. 7, 1969, beginning 2 pm. Garland Community Center, Garland Rd. & Ave. F. 3 age classes in each event: Paper Stick, HLG, Indoor Scale, Matchbox. (Matchbox event models must fit in standard kitchen match box while ready to fly except for winding; can be glider or any kind of rubber powered model.) Paul Cardwell, ph. 214-279-0516.

WISCONSIN - Milwaukee. Indoor sessions each Thursday from 7:30 pm to 9:30 pm at Sherman Social Center, North 51st St. and W. Locust St. Ken Kraemer, 3945 N. 41st St., Milwaukee, Wisc. 53216, ph. 414-442-5864.

STATE OF THE ART

This month we feature five models from Europe, each one a high-ranking model in the country of its owner. The first one is Andras Ree's latest FAI. This model holds these Hungarian records: Cat. II (24:10) and Cat. III (29:22) and has the highest Hungarian Cat. IV time(31:01). This time would be a record except that it did not exceed the previous record by the required 2%.

Manfred Koller's "Bastard Mk III/2" was the model he flew to 5th place at the '68 World Champs. His single high time at that meet (33:06) is the Austrian Cat. IV record, and in addition the model set the Austrian Cat. I record at 15:01.

Harri Raulio set the second high time at the Finnish Team Selection Finals with model #3. His Cat. II time of 20:16 was only 1:05 lower than the new Finnish record set by Esko Hamalainen at the same meet.

Two more models appear on page 4; these were the top two winners from the Romanian Indoor Nats. Popa Aurel is 17 years old, and won the Junior event with PAM 969. Note that his model has a lighter wing loading than HOZ-969 by Otto Hints. Otto won the Open event and set the Romanian Cat. IV record at 27:42.

CMOS charts for the first three models appear below, and similar charts are available on request for the Romanian models. All the charts were computed for 0% margin of stability to simplify the computation. Only Raulio sent balance info, and his model was flown at +10% margin.

MODEL STORAGE AND TRANSPORTATION

Part VI - Miscellaneous Topics

On his trip to the 1966 World Champs, Joe Bilgri's box held four complete models and parts of several more. The spare flight surfaces were stored in a false bottom to the box - covered flat and ready for use if needed. Fig. 1 below shows the general arrangement; the surfaces were covered on the box lid and then covered over with a false bottom until needed. All the spare parts needed to brace a wing (pickets, posts, cabane, etc.) were packed away in another box, and Joe braced two wings while he was there.

One of the problems Al Rohrbaugh had with his box (see Oct. '69 INAV) was that wing mount posts tended to rotate and permit the wings to hit other model parts. When I mounted my wings, I devised a mount that couldn't rotate, as shown in Fig. 2. The basic design consists of two 1/16" dia. music wires sticking thru the center web and long enough to hold one wing mount block on each side of the web. On the front side of the web the wires were reinforced with epoxy and blocks built up around the wires. These blocks also helped support the front mount by being made to fit tightly over the mount block. No such support was used on the back mounts, with no ill effects noticed.

This installment concludes the material on box design and construction. Thanks to all you who made favorable comments on the series, and if you come up with some better ideas, share them with us!

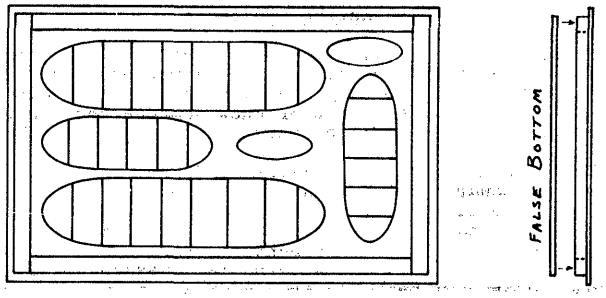


FIG. 1

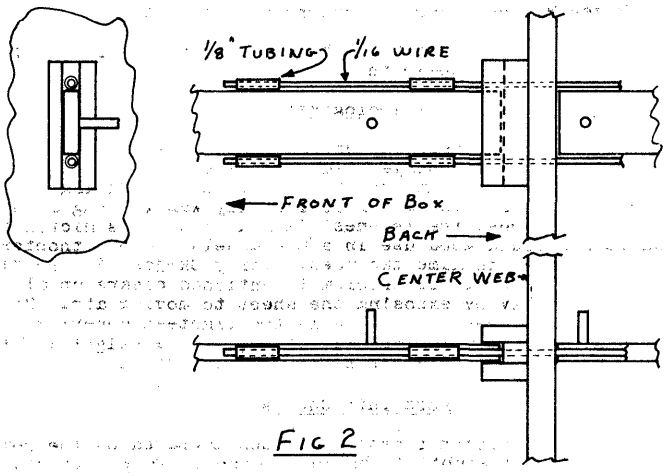
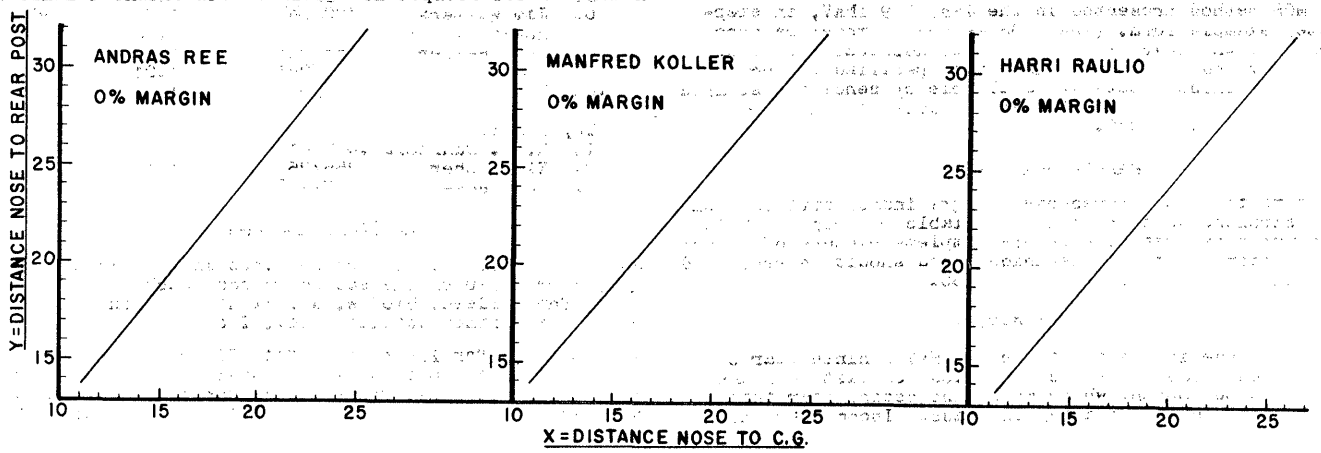
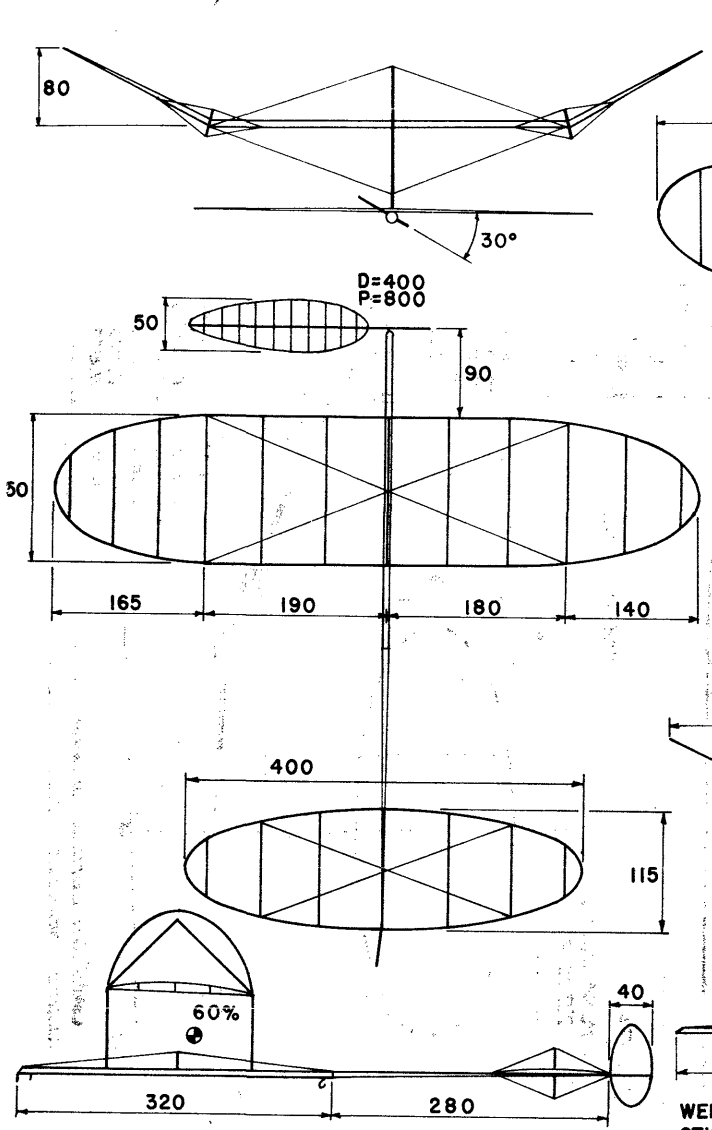


FIG 2



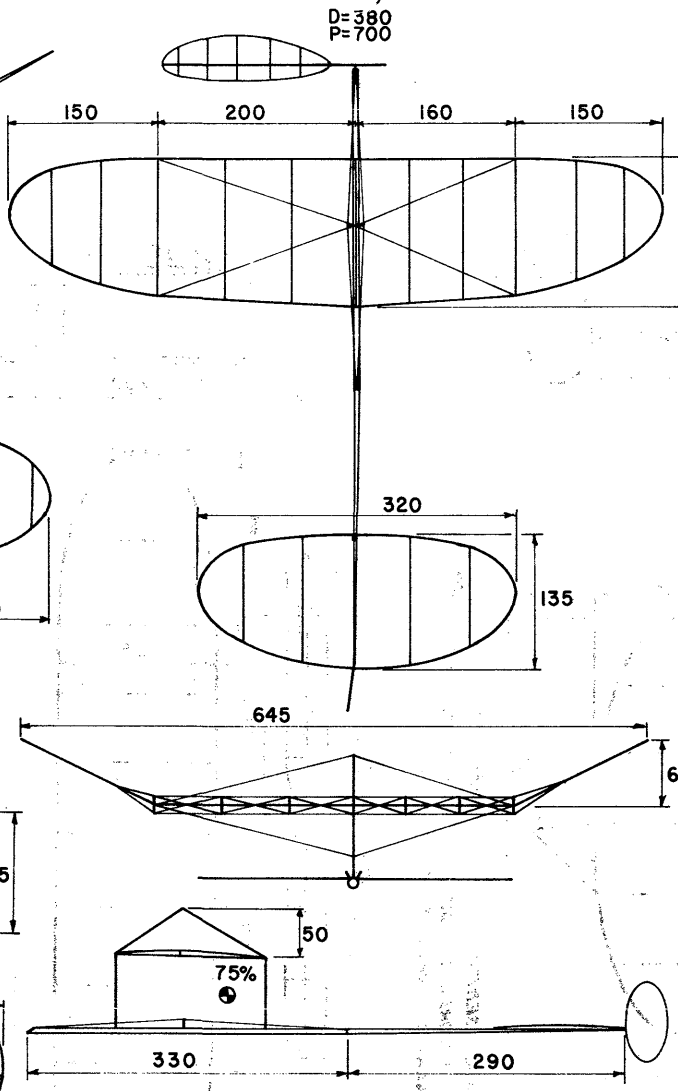


65 Cm FAI

Harri Raulio

FINLAND

Model Weight 0.70g
Rubber-2 str. 1.0x1.2 Pirelli

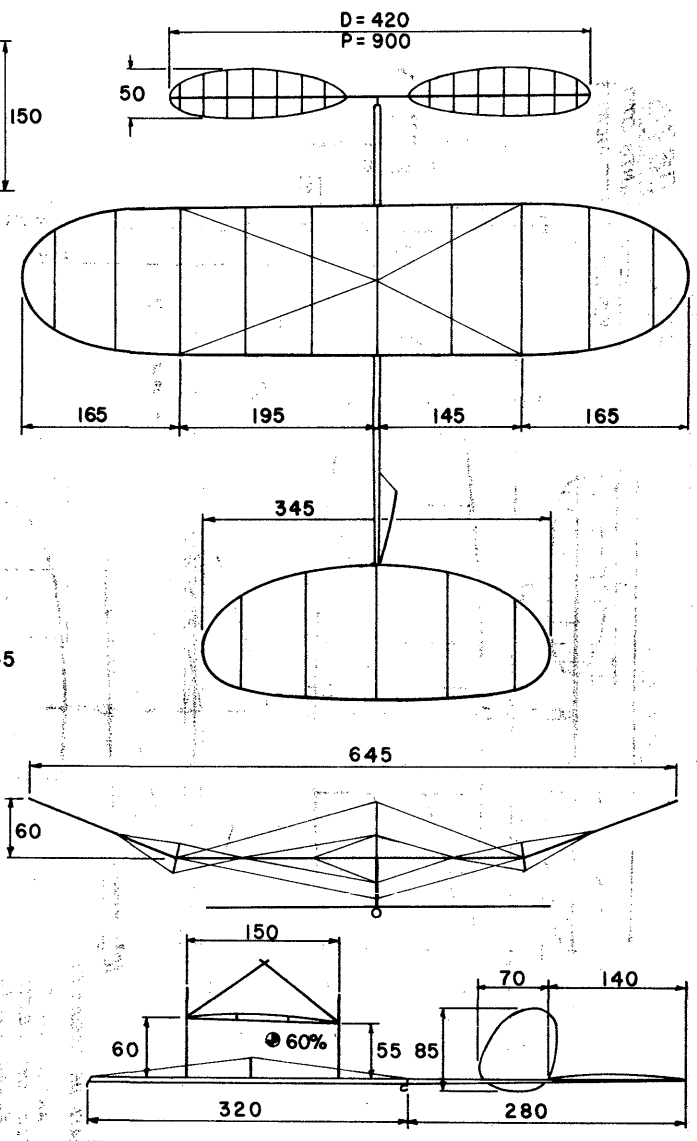


BASTARD Mk111/2

Manfred Koller

Salzburg, Austria

WEIGHTS	
STICK & TAIL	.30 g
WING	.18
PROP	.09
	.57 g
RUBBER	.65



WEIGHTS	
STICK & TAIL	.41 g
WING	.22
PROP	.12
	.75 g
RUBBER	.90

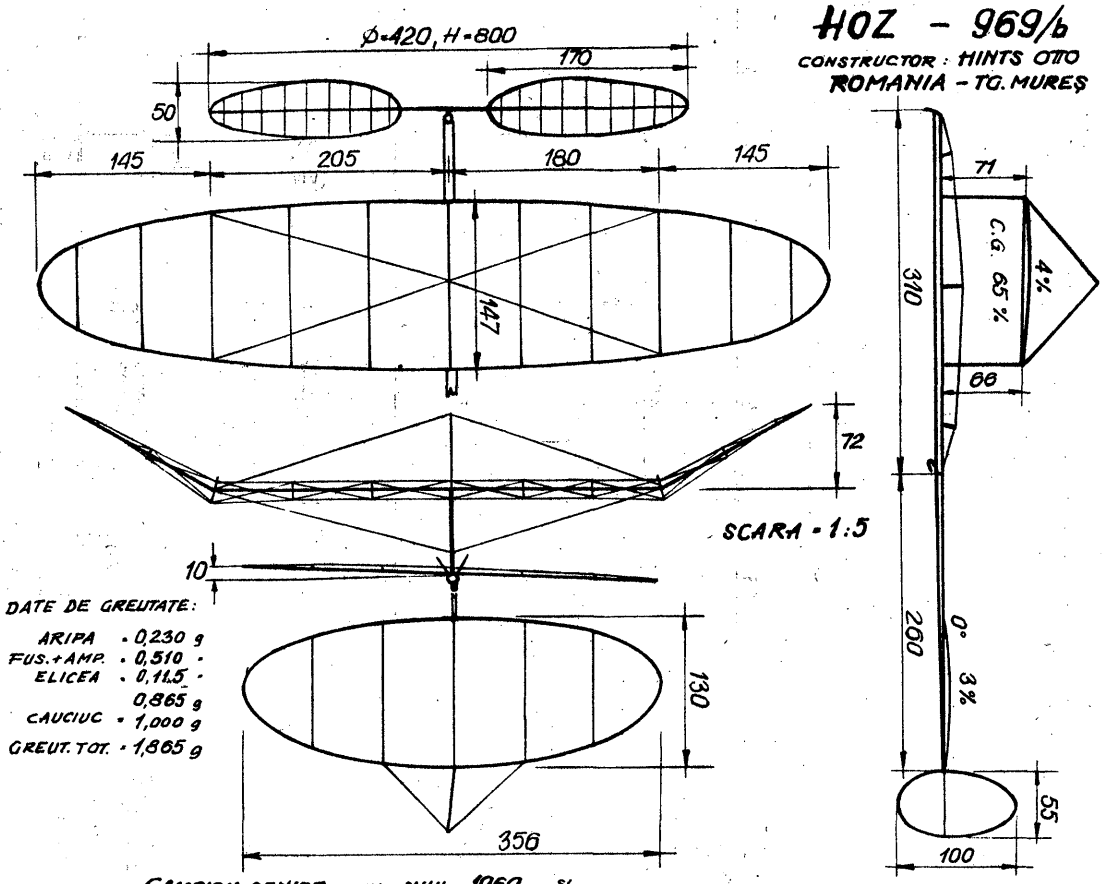
65 Cm FAI

Andras Ree

Budapest, Hungary

HOZ - 969/b

CONSTRUCTOR : HINTS OTTO
ROMANIA - TG. MUREȘ

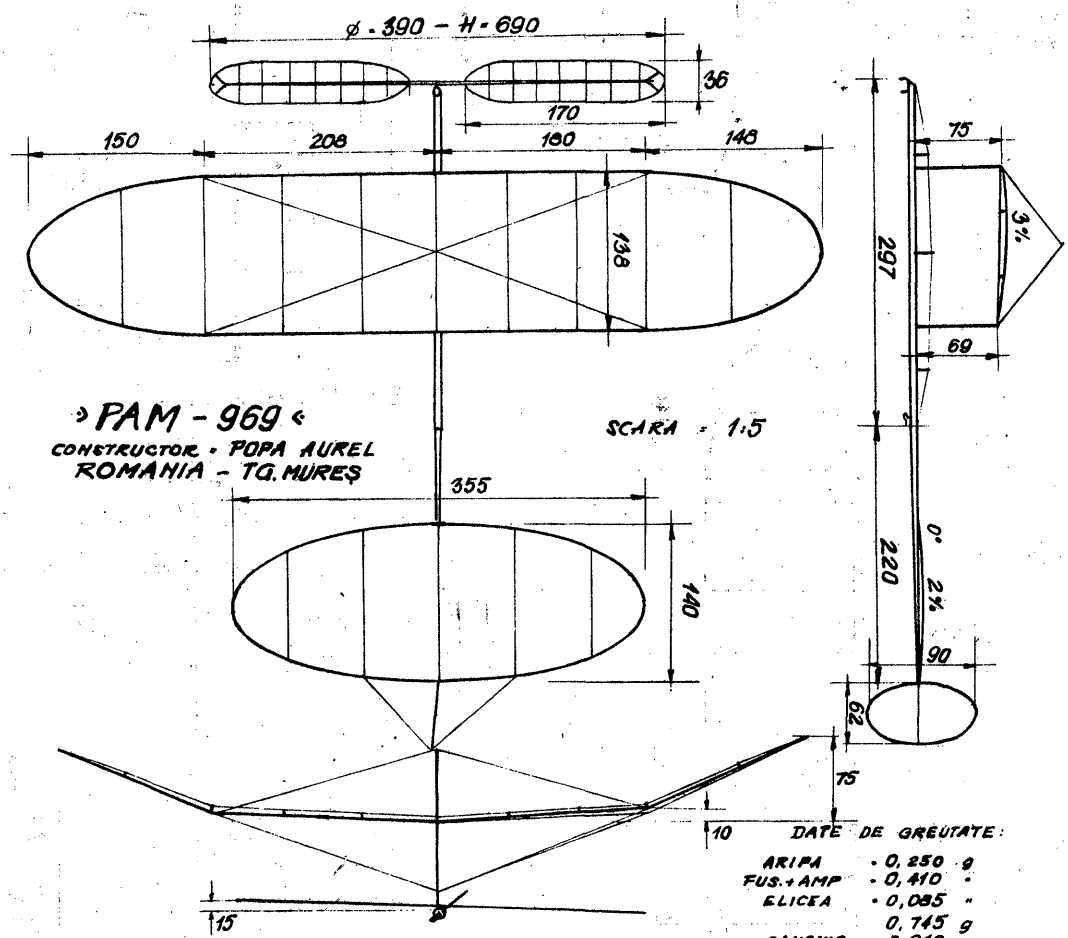


SCARA - 1:5

DATE DE GREUTATE:

ARIPA	0,230 g
FUS.+AMP.	0,510 "
ELICEA	0,115 "
	0,865 g
CAUCIUC	1,000 g
GREUT. TOT.	1,865 g

CAMPION SENIOR IN ANUL 1969 ȘI
DEȚINĂTORUL RECORDULUI NAȚIONAL ROMÂN CU 27 min. 42 sec.
SLĂNIC - PRAHOVA, 1969 IN. 22-25



» PAM - 969 «
CONSTRUCTOR - POPA AUREL
ROMANIA - TG. MUREȘ

SCARA - 1:5

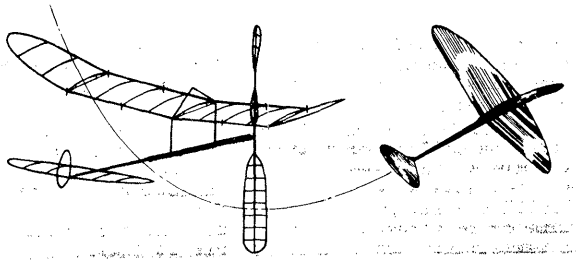
DATE DE GREUTATE:

ARIPA	0,250 g
FUS.+AMP	0,410 "
ELICEA	0,085 "
	0,745 g
CAUCIUC	0,810 g
GREUT. TOTALĂ	1,555 g

CAMPION JUNIOR IN ANUL 1969
SLĂNIC - PRAHOVA, 1969. IN. 22-25

The Voice of N.I.M.A.S. DEC · 1969

INDOOR



NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

****NATIONAL INDOOR MODEL AIRPLANE SOCIETY****

New Members!

HARRY R. COOK, 6319 Marty, Overland Park, Kan. 66202
T. G. CUNNINGHAM, 5740 North 11th Way, Phoenix, Ariz. 85014
GEORGE J. FLYNN, 3 Ames St., Cambridge, Mass. 02139
FRANK L. HAYNES, 992 Findley, Bronx, N. Y. 10456
WARREN G. LAWRENCE, 2210 Tilson Circle, Decatur, Ga.30032
MARK WRIGLEY, 70 Valentine St., New Bedford, Mass. 02744

Honorary Members

BRUCE EDWARDS, 170 Ladbroke Grove, London, W10, England

Family Memberships

T. G. CUNNINGHAM, Jr., 5740 North 11th Way, Phoenix, Ariz. 85014

Special Action Committee

The following indoor fliers have volunteered to act as local instructors for the NIMAS Special Action program (in addition to those listed last month):

Jim Noonan, 7454 W. Thurston Cir., Milwaukee, Wisc. 53218
Vern & Dale Hacker, 25100 Euclid Ave., Euclid, Ohio
Harry Cook, 6319 Marty, Overland Park, Kan. 66202
Robert Underwood, 4109 Concord Oaks Dr., St. Louis, Mo. 63128
Bob Dunham, 4730 S. Yorktown Ave., Tulsa, Okla. 74105
John English, 4233 E. 52nd Place, Tulsa, Oklahoma
Bob Hanford, 3838 S. 88th E. Ave., Tulsa, Okla. 74145
Tom Vallee, 444 Henryton So., Laurel, Md. 20810

What do local instructors do, and how do they get the attention of the youngsters? Here is the story of one of the present crop of volunteers, relating his own methods:

"My technique for starting indoor model flying clubs is this: As a school teacher, I have a ready-made "door opener". I bring a simple model to school (paper pusher or Easy B), and fly it for the boys. I usually find at least one who is interested enough to try building one, using material I furnish. After this one succeeds, some of his friends usually give it a try. I have averaged 12 boys per school year who were getting 3-5 minutes with paper stick and usually 2 who achieve 5-7 minutes with a microfilm model (17' ceiling; these boys had no previous building experience and learned in a 6 month period). The 3 factors required for success are:

1. Someone interested enough to take time to work with young boys and girls.
2. Hold flying sessions at least once a week.
3. A goal. (This can be a simple perpetual high time trophy; give the more experienced fliers a handicap to provide a better chance for the newer ones.)"

The above was written by Chester Wrzos, who founded a very active group in New Jersey and now has moved down to teach in Lynchburg, Virginia. FAI Finalists and 1969 Nats contestants will remember Chet as CD of both the Finals and the Indoor Rubber portion of the 1969 Nats at Lakehurst.

Merry Christmas!

Lack of time and finances prevents us from sending each of you a card, but we enjoy all the many cards we get each Christmas. So, Merry Christmas and a Happy New Year to each of you!

Rubber Strippers Available

Bob Dunham has offered to open up his production line on Bilgri-type strippers once again. These are very nice units made from plexiglas, and work very well with either a single blade or multiple blades (See Jan. '67 INAV). The price is $5 per unit, with deadline on ordering set for Jan. 20, 1970. All units will be produced at the same time, according to orders on hand Jan. 20. Send orders to Bob Dunham, 4730 S. Yorktown Ave., Tulsa, Okla. 74105.

Spread The Word!

Ken Kraemer's weekly indoor activity (see Contest Calendar) was called to the attention of a local paper, and this resulted in an excellently written article, complete with good pictures. Let this be a reminder - it costs you nothing to try for publicity, and it often pays off very well. The only caution you should observe is to have a knowledgeable person accompany the reporter to explain in detail (and logical sequence) just what is going on.

Volunteer Needed

Two long overdue NIMAS forms for future surveys have now been designed, but they need to be typed in final form for printing in quantity. So, we need one volunteer with a typewriter to make one copy of each form - two pages of typing total. If the typewriter has one of the newer type fonts, this is preferable. Volunteer to Box 545, Richardson, Tex. 75080.

Site Survey Form

Years ago it was proposed that a survey be made of the sites in regular use around the country and that this info be published in a booklet for NIMAS members. A preliminary version of the form is now being sent out, but the collection of the information will be speeded if interested fliers will send a stamped envelope for their form. it will also ease the workload here - so send your envelope to Box 545, Richardson, Tex. 75080.

Winders?

It has been called to our attention that the W[illegible]n 16:1 ratio winder is out of production. This winder has been the "old faithful" for so many years, but now it is gone. Does anyone know of any existing supplies of these winders or of another low cost winder to fill the gap?

NFFS Design Competition

The National Free Flight Society and AMA are co-sponsoring a design competition for a small field rubber powered model. Entry deadline is April 1, 1970, and an entry blank and set of rules can be obtained from Annie Gieskieng, 1333 S. Franklin St., Denver, Colo. 80210.

NIMAS Awards

CAT. I HLG AWARD - 0:24.5, Patty Jo Thornhill

World Championship Dates

It was erroneously reported last month that the 1970 Indoor World Champs would be held April 2-6, 1970. The report from the November CIAM meeting places the dates as April 9-12, 1970. The geographical location of the salt mine is 60 miles north of Bucharest, Romania. This site is reputed to be one of the best sites in the world because of its combination of virtually zero drift and a 200'+ ceiling height.

FAI Decals

Team Selection Manager Clarence Mather has attempted to distribute special decals (donated by NFFS) to all Quarter-Final and Semi-Final qualifiers. Qualifiers who have not received their decals should contact Clarence at 3880 Ecochee Ave., San Diego, Cal. 92117 and he will send the decals promptly.

INDOOR RULES

The following rules changes will apply to indoor flying beginning Jan. 1, 1970:

Add to Sec. 8.5 (Indoor Cabin Definition): The maximum cross-section must be taken at some point on the fuselage which contains the rubber motor.

Change the indicated paragraphs as noted:
8:13 Official Flight. Each contestant shall be allowed a total of five flights. All flights are official regard-

less of duration. Delayed flights are not recognized, with one exception (see 8.14). Flights during which any part is dropped shall be considered an official flight with no time recorded.

8.14 Unofficial Flight. An unofficial flight occurs when a model strikes the balloon or tether of another contestant who is attempting to retrieve a model. At this point the contestant can make a decision as to allowing the time to continue until the flight is completed or call it a no flight (no time or no attempt is recorded). He must make the decision immediately and cannot reverse it later.

8.15 Timing of Flights. Shorten the paragraph as follows: If the model does not free itself within the 10 seconds allotted, the watch shall be stopped, 10 seconds deducted from the time indicated, and the results recorded. (Delete the balance of the paragraph.)

A check with AMA HQ gave the answer that present records will stand, which is reasonable in that no actual change was made in how the flights are qualified. On a historical note, this action is the final part of a package of recommendations generated by an indoor advisory committee set up in 1963. NIMAS members participated in the recommendation also, in the form of a rules questionaire which was circulated as a part of INAV.

CONTEST CALENDAR

ARIZONA - Phoenix. Indoor sessions in Arcadia High School Gym, 7 pm to 10 pm the second Tuesday each month. Contact Terry Thorkildsen, 3103 W. Willow Ave., Phoenix, Arizona 85029 for further details. Cat. I site.

ILLINOIS - Chicago. Cat. I indoor sessions at Girl's Gym of Forest View High School, 2121 Goebbert Rd., Arlington Hts., Ill. Sessions each Sunday from 9 am to 5 pm, except Dec. 14, 1969 and Feb. 8, 1970. Call Al Sortwell at 312-439-1497 for directions to gym.

MARYLAND - Silver Spring. Indoor sessions at JFK High School, 1901 Randolph Rd., Silver Spring, Dec. 12, 1969 and Jan. 9, 16, 30; Feb. 20, 1970. 7 pm to 11 pm.

MASSACHUSETTS - M. I. T. Cat. II indoor sessions at MIT Armory, Mass. Ave. & Vassar St., Cambridge, Mass., 3:30 pm to 6:30 pm, Dec. 13, Jan. 31, Mar. 7. Indoor contest Apr. 11, 1970, 1:30 pm to 8:30 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. ph. 358-4013.

WISCONSIN - Milwaukee. Indoor sessions each Thursday from 7:30 pm to 9:30 pm at Sherman Social Center, North 51st St. and W. Locust St. Ken Kraemer, 3945 N. 41st St., Milwaukee, Wisc. 53216 ph. 414-442-5864.

EUROPEAN CONTESTS!

The Championship of Budapest, Hungary was held in September, with these three winners:

1.	Andras Ree	24:10	23:35	47:45
2.	Antal Egri	20:08	20:31	40:39
3.	Geza Varszegi	19:44	17:24	37:08

This was the final indoor meet for the Hungarians for 1969, and their last opportunity to train for the World Champs, unless they can manage to get to the salt mine in Romania sometime before the meet.

On October 26, 1969, Coppa Urbe (an annual indoor meet in Rome) was held and the Italian team for the 1970 World Champs was selected from the winners. Two sets of results are noted below; the first is for FAI models and the second for a new "sport category" which has a minimum weight of three grams.

FAI Models				
1.	Egizio Corazza	29:29	30:31	60:00
2.	Gennaro Masciullo	22:09	23:10	45:19
3.	Luigi Chiarottini	20:36	21:32	42:08
4.	Carlo Cotugno	20:43	20:59	41:42
5.	M. Ludovica Corazza	20:11	20:26	40:37
6.	Loris Kanneworff	16:19	19:03	35:22
7.	Bruon Militi	15:08	16:26	31:34
8.	Fernando Migani	13:59	12:21	26:20
9.	Alberto Frioli	11:07	13:09	24:16
Sport Category				
1.	Armando Seghetti	7:39	8:55	16:34
2.	Paolo Vittori	8:18	7:50	16:08
3.	Paolo Martini	6:57	6:50	13:47
4.	G. Carlo Domenici	6:36	6:14	12:50
5.	Luciano Covaro	5:53	5:58	11:51
6.	Walter Ricco	6:24	5:24	11:48

As noted above, the Italian team will be Corazza, Masciullo and Chiarottini. Except for Corazza, who flew in several other European meets this year, the contestants had not had an opportunity to test fly their models.

STATE OF THE ART

The model of the month is Tom Vallee's record holding helicopter. Note that the plan sheet shows three records in less than a year, with a longer motor stick for the last record. This model would be exceptionally easy to build, since the rotor blades would not require a special jig for the lower rotor. Try a helicopter - they are fun and a challenge. They also make fine crowd pleasers for demonstrations.

RECORDS? MAYBE!

These records should have been listed in the November issue, and have already been homologated. The marks were set at Willis School in Hampton, Va. (Cat. I, 20' ceiling)

Open Helicopter - 7:44.4, Tom Vallee
Open FAI Cat. I FAI - 18:48, Tom Vallee
Open AMA Cat. I FAI - 19:43.5, Tom Vallee

POSTAL CHALLENGES

Several fliers have been talking about the concept of postal competitions on flights which do not touch the top of the site. The usual NIMAS fudge factor would apply to the flights, and the concept should provide an interesting contrast to current flights which rafter-bang or ceiling-scrub for a considerable portion of the flights. It can be said with certainty that all present Cat. I records, including World Records, were set with the models in continuous or intermittent contact with the ceiling for about 55% of the flight. Those who are interested in this idea send in your times, listing the flight time, FAI ceiling measure of the site, and estimated altitude the model did attain. We'll have a "Top Ten Ceiling Dodger" listing!

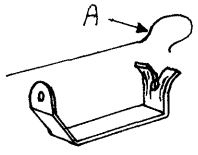
TOP TEN EASY B

		Time/ceiling	Fudge (to 35')	Score
1.	Bob Platt	575/20'	1.32	760
2.	Jim Walters	675/37'	.972	656
3.	Clarence Mather	590/30'	1.08	637
4.	Joe Pontecorvo	516/24'	1.21	623
5.	Joe Deady	636/37'	.972	618
6.	Pete Patterson	492/24'	1.21	594
7.	Hal Crane	415/20'	1.32	549
8.	Howard Haupt	384.25'	1.18	454
9.	Phil Hainer	383/25'	1.18	453
10.	Rex Powell	395/31'	1.06	420
Top Juniors				
1.	David Sandelius	460/37'	.972	447
2.	R. J. Dunham, Jr.	467/41'	.92	431
3.	Kim Mather	255/25'	1.18	302
4.	Neal Rozelle	287/35'	1.00	287

HINTS AND KINKS

Novel Thrust Bearing

Egizio Corazza of Italy sent in the following thrust bearing design (see sketch below). He says, "The front part of the dural bearing is bent and bored in the usual way; the rear part is bored and then cut from the end to the hole. The two ends are twisted and filed slightly with a thin knife file, so the prop shaft, first passed through the front hole, may fit into the rear hole through the slot. The fit should be tight enough that only the part marked 'A' will pass through the slot; thus when the shaft is pushed to the rear, the straight part won't come out and is held firmly.



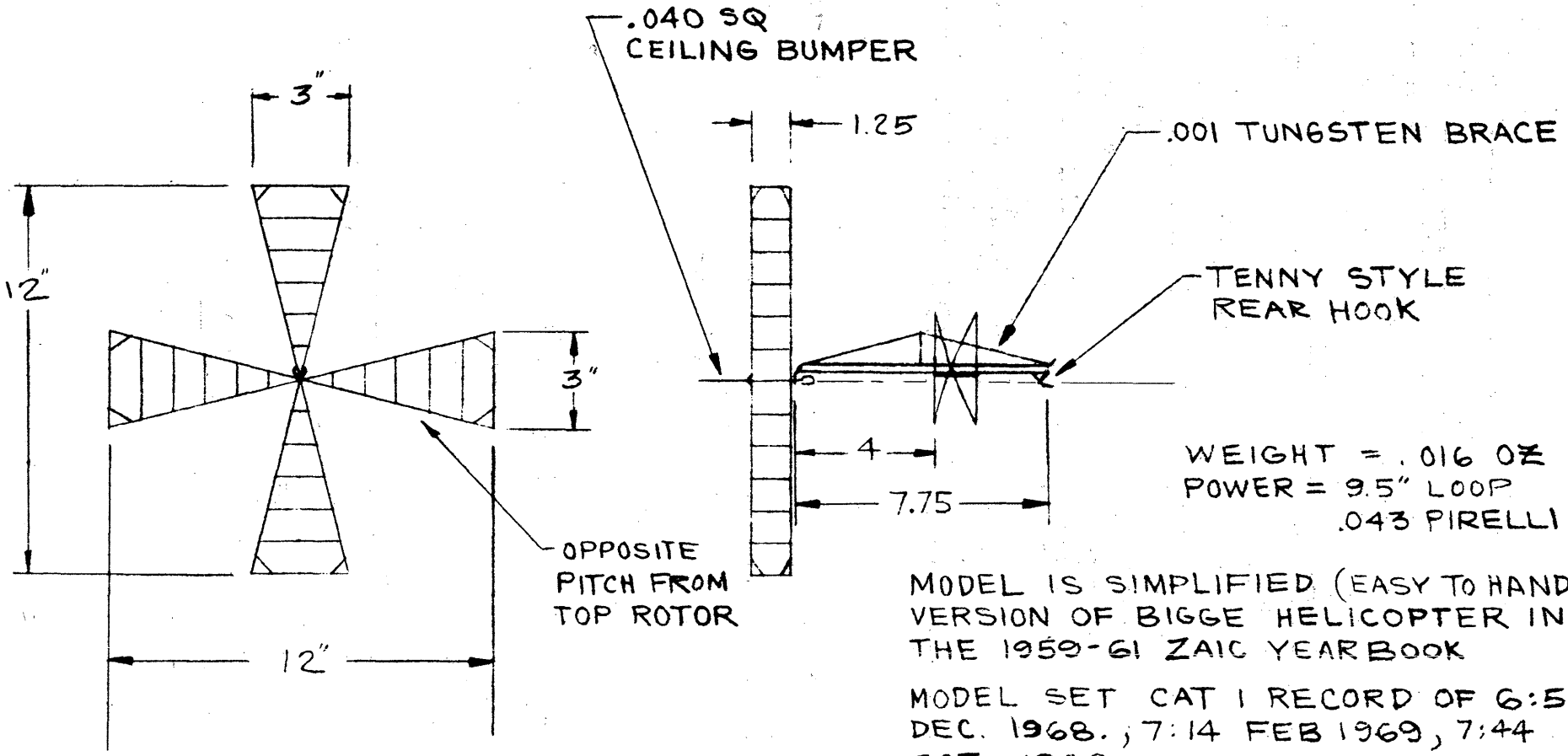
Dihedral Hint

Before he covers his wings, Bob Randolph glues a short length of dacron monofilament on top the spar at each dihedral joint. If the spar breaks completely as he puts in dihedral, the monofilament holds and prevents a rip in the film.

End Lube Mess

Wayne Zink stores his rubber lube in a 15 cc nasal mist spray bottle (Dristan), and is able to squeeze out the exact amount required. This type of bottle has to be disassembled to clean it, and Wayne removes the siphon tube at the same time. Similar bottles without the tube (just a removable dropper top) are available from W. H. Curtin and E. H. Sargent scientific supply houses.

DEC '69 INAV



WEIGHT = .016 OZ
POWER = 9.5" LOOP
.043 PIRELLI

MODEL IS SIMPLIFIED (EASY TO HANDLE) VERSION OF BIGGE HELICOPTER IN THE 1959-61 ZAIC YEARBOOK

MODEL SET CAT I RECORD OF 6:55.9, DEC. 1968., 7:14 FEB 1969, 7:44 OCT. 1969

MOTOR STICK INCREASED TO 9:25" FOR 7:44 FLIGHT — NEW WEIGHT -013 OZ.

CORKSCREW HELICOPTER

designed by

TOM VALEE

THE LAB

Two Rubber Tests

Jim Richmond, who obviously has good rubber to go with good models, has developed the following rating system for his rubber:

$$\text{Rating} = \frac{\text{Torque at 50\% turns} \times \text{Maximum Turns}}{\text{Weight of Loop}}$$

Jim says: "In my testing of rubber, I wind to a predetermined torque - found to be the maximum safe torque for that size rubber, and the corresponding number of turns is 'maximum turns'. I then back off turns to 50% of the maximum and take the torque reading. The back-off is done rather slowly (not at any set speed), while the distance between hooks is maintained at 14" (or whatever it will be on the model). This method doesn't tell you anything about the shape of the torque curve, but it does provide a pretty accurate evaluation of the loop at the mid-point which can be compared with any other loop."

The Sept. '68 INAV presented a sorting test for new rubber, as developed by Joe Hindes. I have worked with this concept until the following test method has evolved:

1. A clamp and ruler are arranged in a vertical plane as shown below.
2. A loop is formed from the rubber to be tested, and inserted in the clamp so that a 10" loop is formed. The loop is measured with 5% of the test weight hanging on it.
3. The test weight is hung on the loop (replacing the measuring weight), and the loop length is measured after 60 seconds. If the loop stretches down to the 5" mark, an arbitrary rating of 5.0 is assigned to the rubber. The test weight is figured on this basis:

$$\text{Weight} = \frac{\text{Area of loop cross section (sq.in.)} \times 11 \text{ oz}}{.0051 \text{ sq. in.}}$$

For example, a loop from rubber .124" x .041" has a cross section of .0051 sq. in. and the test weight is 11 ounces.

Both the above tests are experimental, and neither is likely to be the final answer. A summary of advantages and disadvantages would include the following factors:

Richmond test: It is sensitive to ambient temperature and to personal judgement of maximum torque allowable. It is slightly sensitive to the length of time it takes to back down to 50% max turns. The fact that Jim's test uses made-up motors can be good or bad, depending upon your viewpoint. On the plus side, Jim gets good results with the test, and it is directly related to the "real world".

My modification of the Hindes test is also sensitive to temperature, and is very sensitive to accurate measurement of cross section. An improvement would be to use weight per unit length, but this would partially nullify the advantage of spot-checking on a complete skein. Also my test is not properly defined according to what rating number is ideal. On the plus side, the test can be done quickly, on rubber skeins before they have been stripped into indoor sizes. Rubber which tests between 4.5 and 5.2 seems to be very good for most indoor uses, but the test really only checks for relative torque/cross section.

If anyone tries any of these tests, please relate your findings and opinions. It is clear that accurate and meaningful testing of rubber will require much work!

A LOOK AT YESTERYEAR

The plan reprinted below came from Model Airplane News of May 1938. The article by Charles Belsky was entitled "A Low Aspect Ratio Tractor", and Mr. Belsky put forth the observation that low aspect ratio models were becoming more popular then. The chief advantage cited was more efficient structure due to shorter spars. Hal Crane please note the above! (Hal is now well aware of the advantages of the planform, and has been using it for some time. He has even developed theoretical calculations to show that optimum chord for 65 cm FAI is about 6½".)