

INDOOR

NEWS and VIEWS

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

****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 INDCOR 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.

NEWS FROM AROUND THE WORLD

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		
Andy Richmond	Bob Reynolds	0:35.0
0:29.9 x 1.3 = 0:38.9		

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.

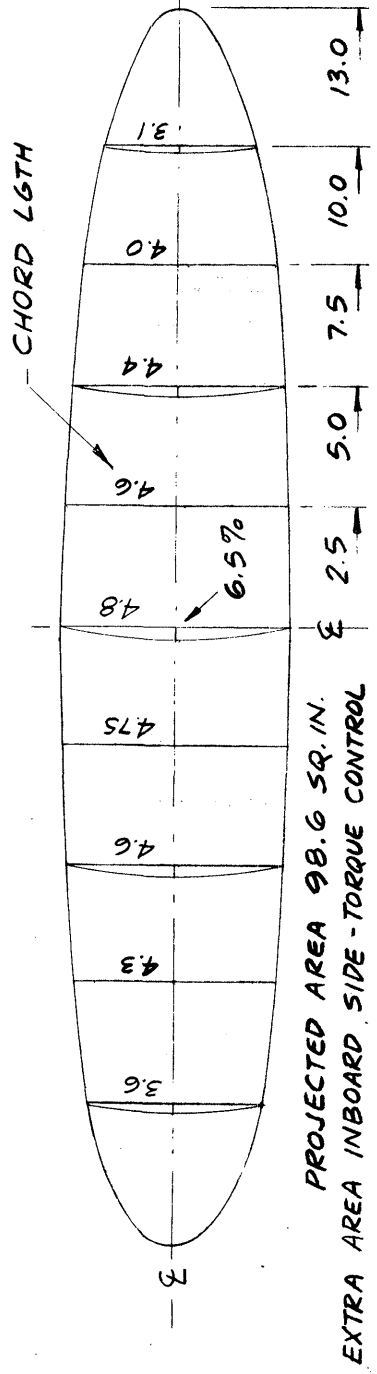
OHIO - CLEVELAND

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

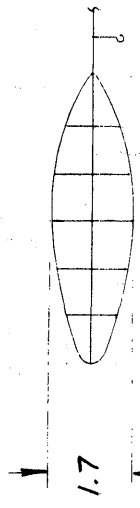
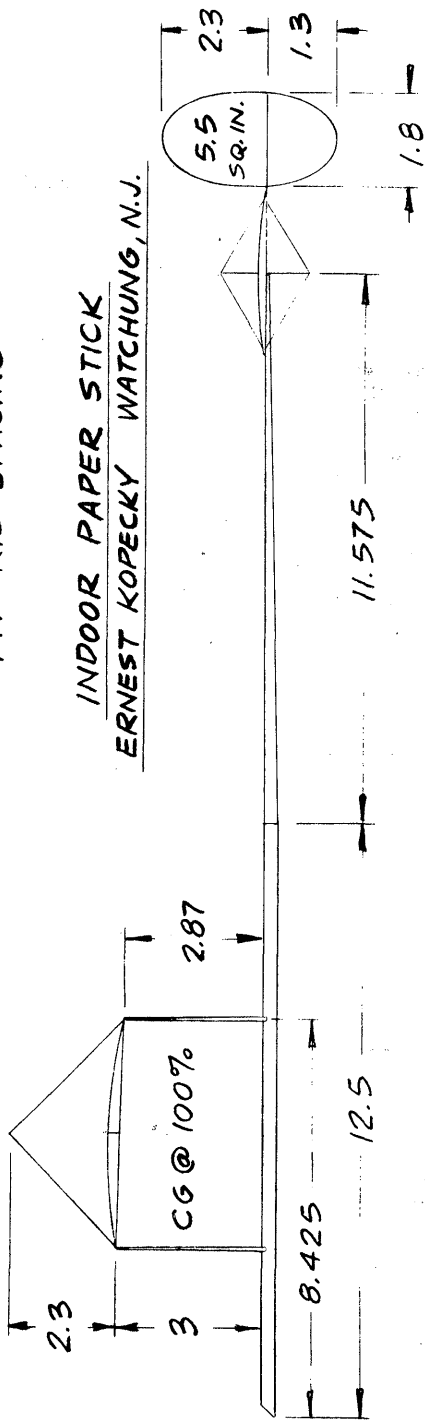
The Jan. 9 session at Arlington Rec. Hall had a very good turnout. Top times - Rubber - 11:34.8, Bob Putman; Easy B - 7:17, Bud Tenny; HLG - 0:52.5, Bud Tenny. This area will have another flying session on Feb. 6 at the Arlington site and a Cat. II contest on Feb. 20.

Jan 66

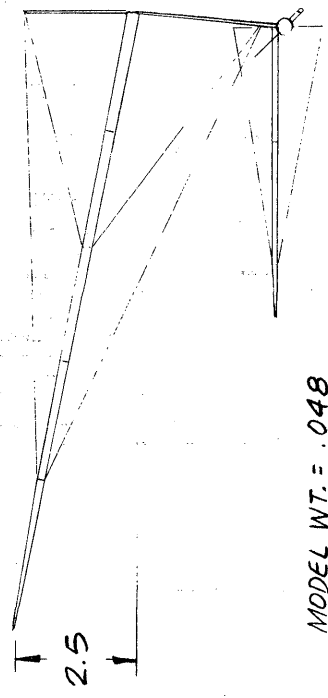
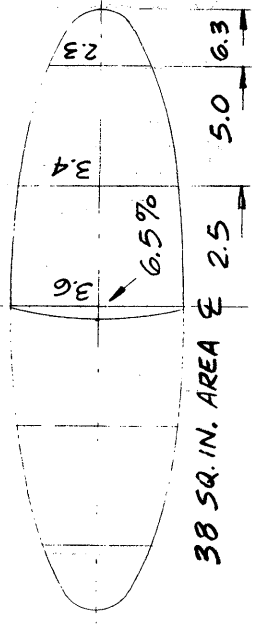


TYP RIB SPACING

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

Diligente 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.

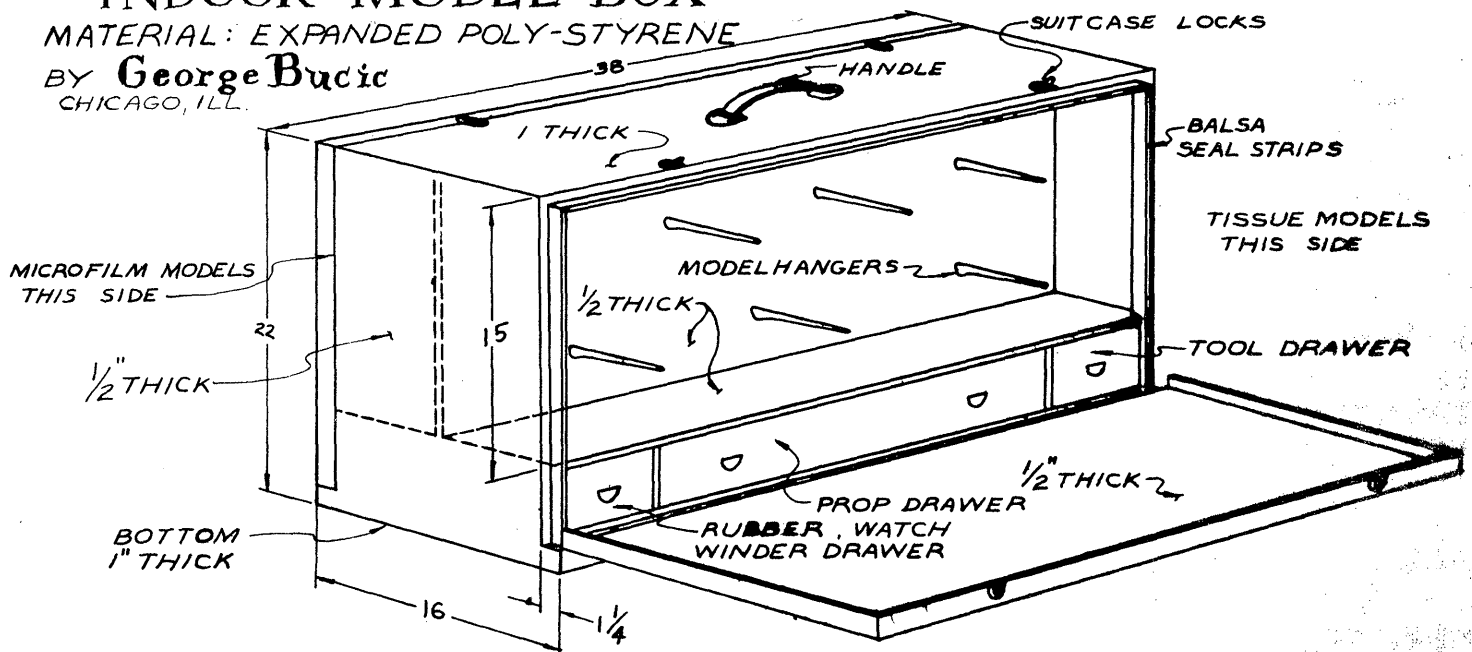
Indoor Model Box

George Bucic of the Chicago Aeromuts 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.

INDOOR MODEL BOX

MATERIAL: EXPANDED POLY-STYRENE

BY **George Bucic**
CHICAGO, ILL.



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 Skrzjanc
Open Autogyro - 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 William 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

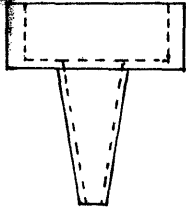
Autogyro
Jr. 0:57.2 Raymond Steinbacher
Sr. 2:01.2 Alton DuFlon, Jr.

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

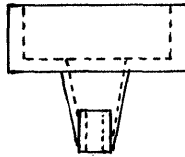
the rate of flow of the solution onto the water; and many hoops with safe storage to match. Good hoop sizes and wood sizes are: 8" x 18" (1/4" sq. hard balsa), 8" x 30" (1/4" x 3/8" or 3/8" sq. hard balsa) and 9" x 40" (1/4" x 1/2" or 1/2" sq. hard balsa). Hoops should be assembled carefully with good glue (epoxy is excellent) and with reinforced corners. If the hoop is not rigid, you may use a sheet of film when the hoop "gives" slightly. The inside 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 interchangeable 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.

Figure 1



Teflon or nylon insert drilled to desired size. Make a set of different sizes, interchange them for best results.

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 test 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 (2 1/2" 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.

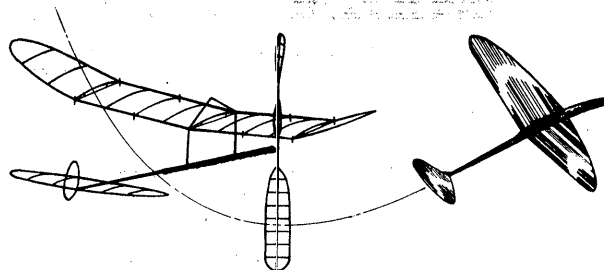
It is hoped that the above examples will cover most of the troubles which will arise for those who want to mix their own film. Example II was chosen to help those who wish to try dope as a base material in spite of the lack of control of additives (those put in the dope by the manufacturer) which may 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."

INDOOR**NEWS and VIEWS**

\$2/ YEAR NIMAS DUES \$1/ YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081



****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 autobiographical 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

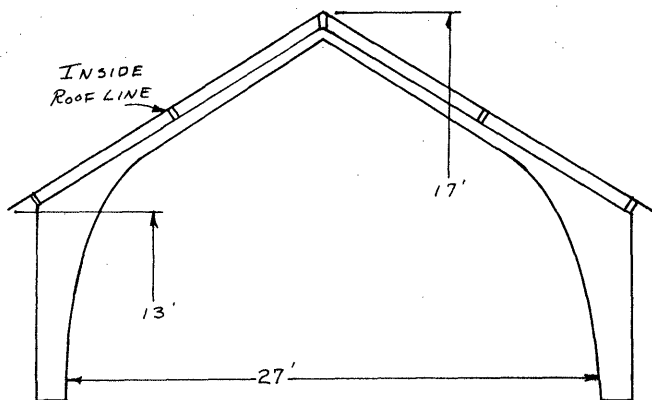
Jim Mayes and Bob Trampenau, the guiding lights of the Elmira (N. Y.) Indoor Model Airplane Club, have been limited to 18' and 20' sites for their activity. As a result their HLG times have been low compared to regular Cat. I times, but Jim and Bob nearly always win postal meets they fly in. Just as 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

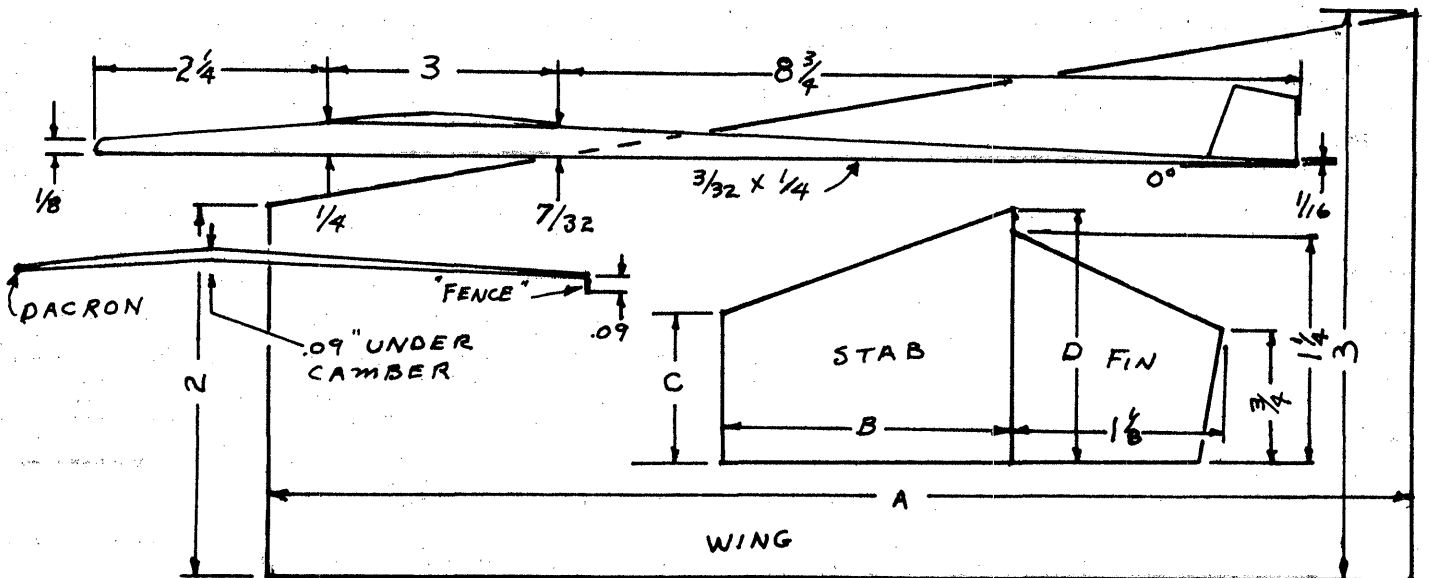
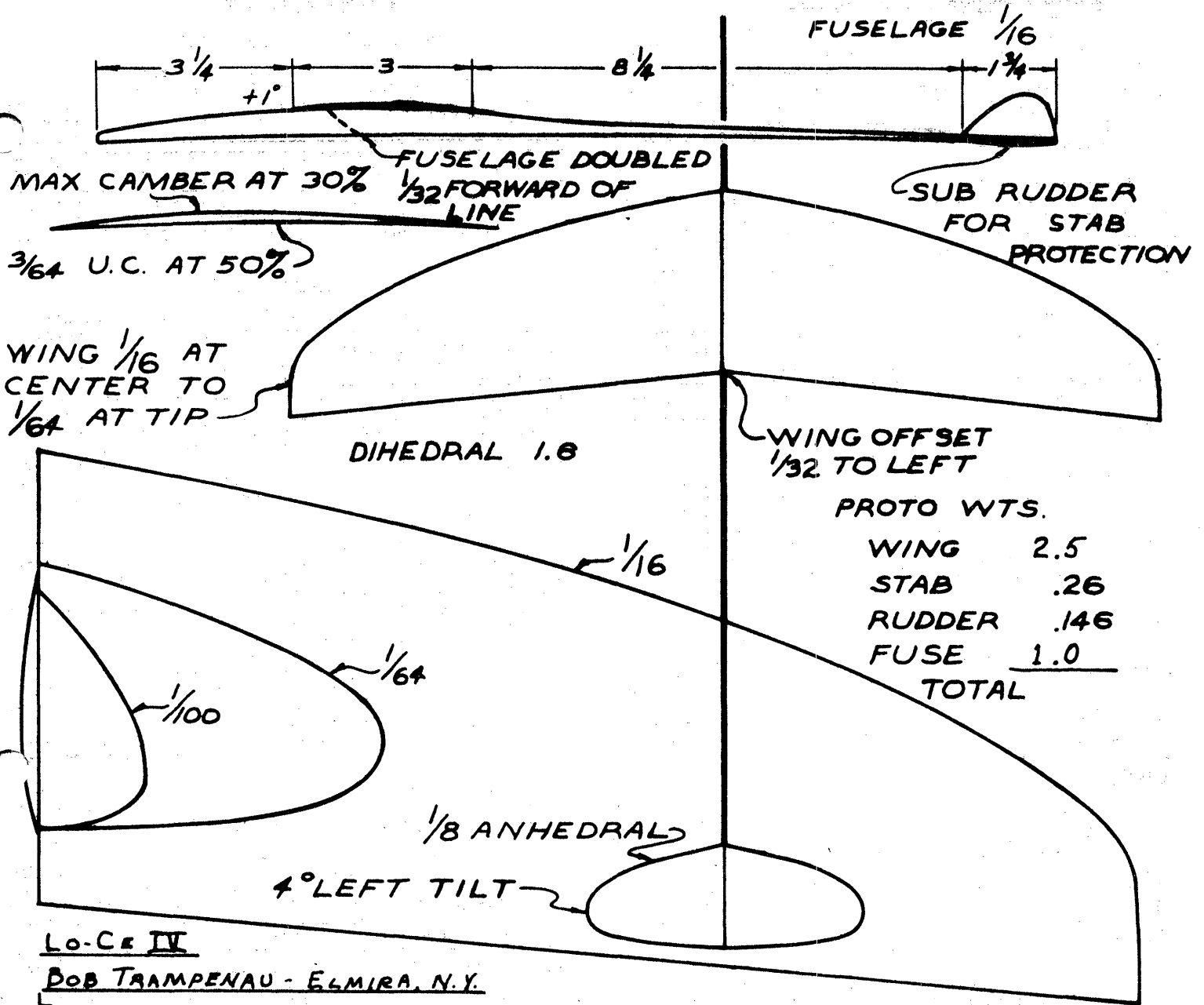
New Marker Pen

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 Hinds 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



PLAIN VANILLA I & II

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 Orbiters 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 Pallet 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 Belleff 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.

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.

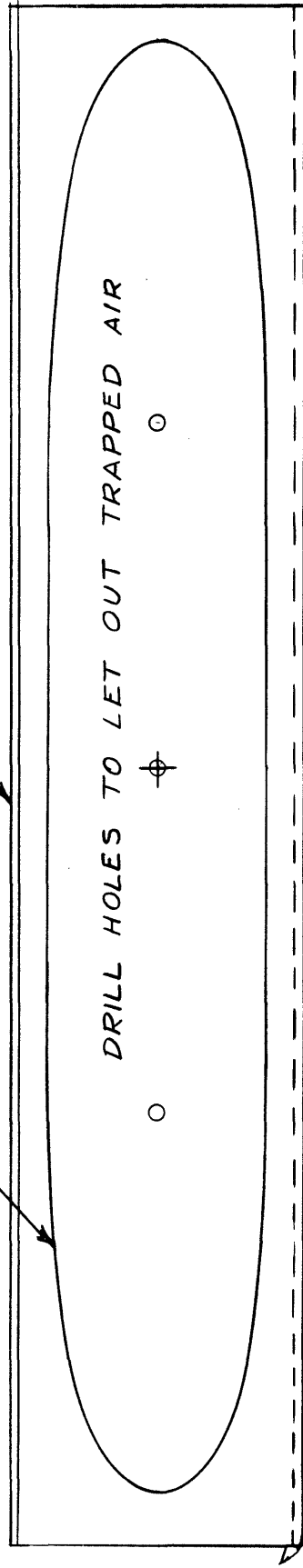
A LOOK AT YESTERYEAR

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

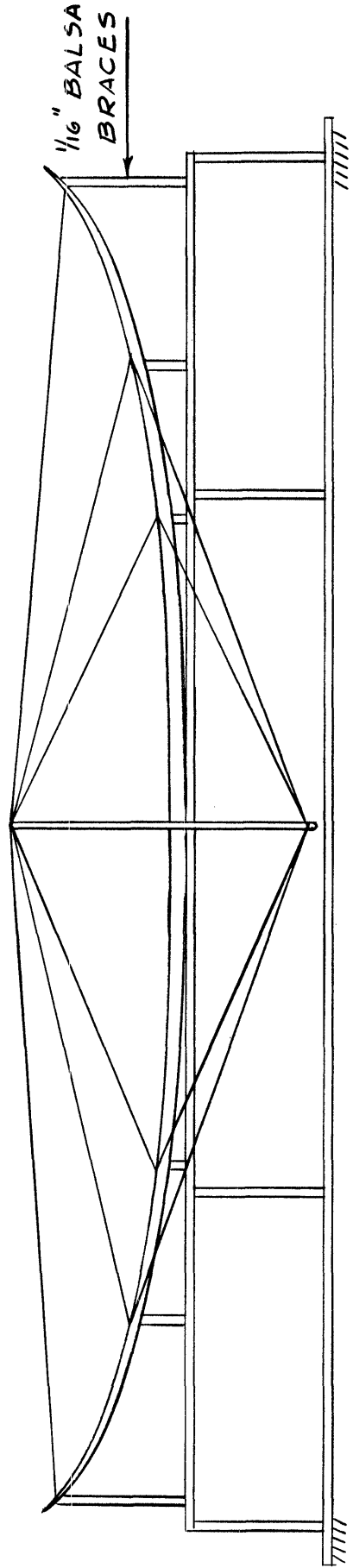
10" ALUM. SIDING \approx 40" LONG
EITHER CUT OFF OR FOLD OVER
UPPER EDGE



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 $\frac{1}{16}$ " WIRE GROUND TO A NEEDLE POINT HEATED BY GAS FLAME,
NOT A CANDLE.



RIGGING FRAME MADE FROM $\frac{1}{4}$ " PLYWOOD.
EDGES SHOULD BE VERY SMOOTH.

INDOOR**NEWS and VIEWS**

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

****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 Brain-busters (Va.), The Flying Bucks (Pa.), The Grumman Engineering Model Society (N. Y.), The Thermaleers (St. Louis), The D. C. Maxcutors (Wash., D.C.) and the San Diego Orbiters. 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

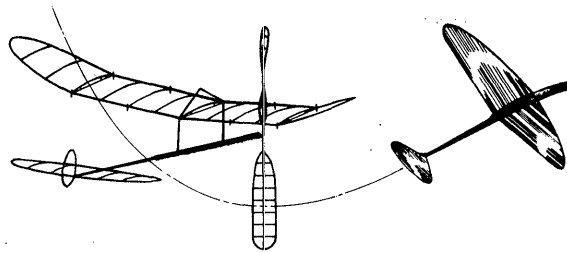
In recent months the mail has been heavy, as is usual for the winter months. Since the correspondence is the life-blood of INAV, this leads to an accumulation of good material for future issues. On the other hand, it leads to slow answers to the letters; please don't get discouraged at the delay. In 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

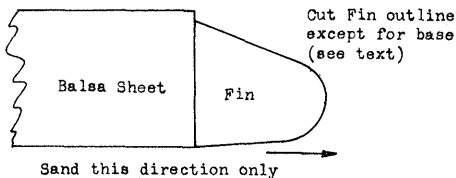
HINTS AND KINKS

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 balsa 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 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 Hamford, 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, 3 1/2" 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

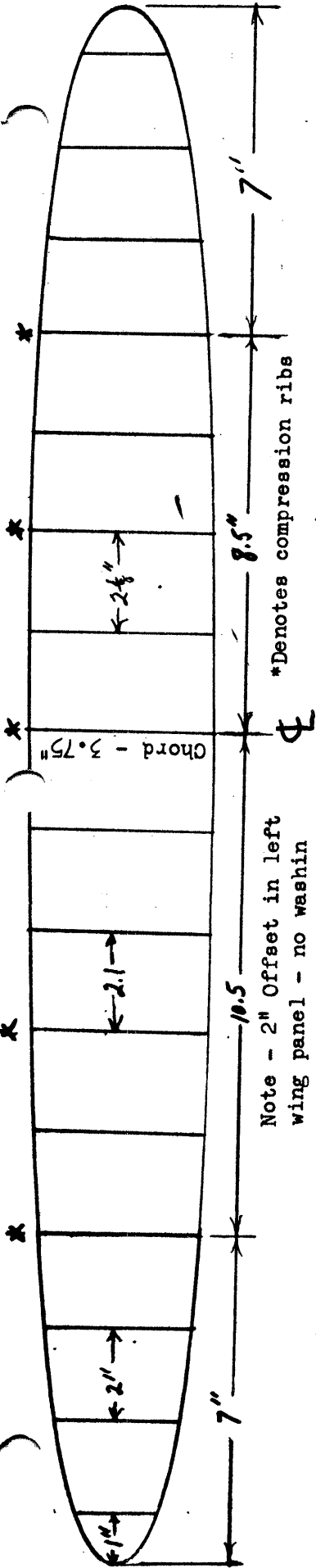
This model of the month by Joe Hinder seems to thrive on poor conditions and keep coming back for more. It has three principle trophies to its credit: 1st, '65 Great Lakes Indoor Meet (12:38); 3rd, '65 Nats (21:01.2); and 1st, '66 Great Lakes Meet (14:11). In each of these contests the conditions were 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

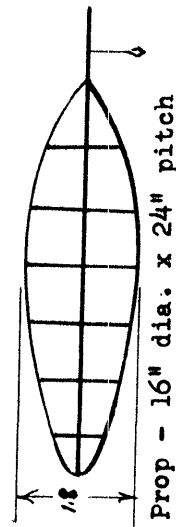
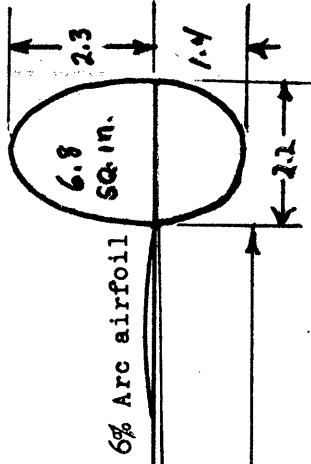
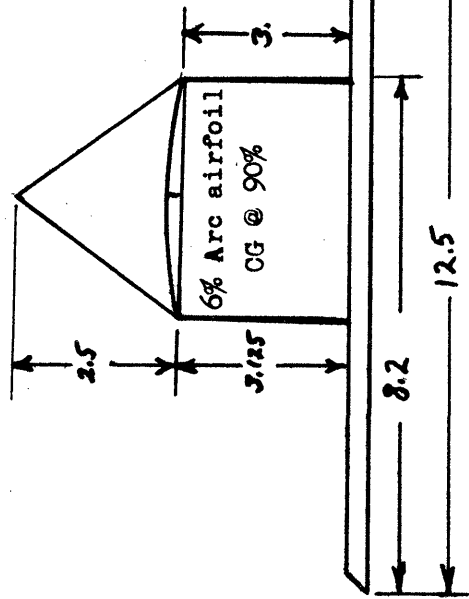
Hal Blubaugh has devoted a considerable amount of time and energy developing rubber test mechanisms and has accumulated quite a bit of test information. The following information is presented as a preliminary report, and some future issue will present a report on the test gear and supporting test results:

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.

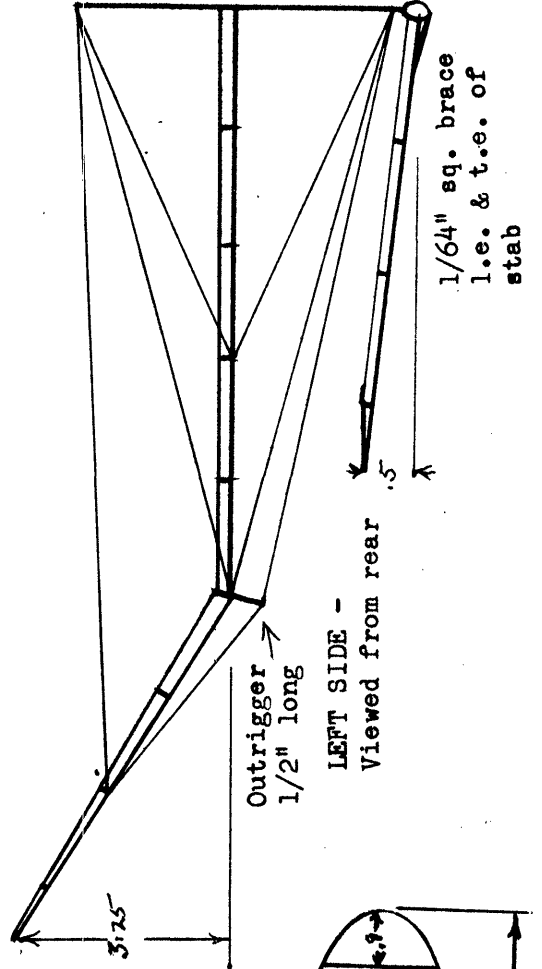
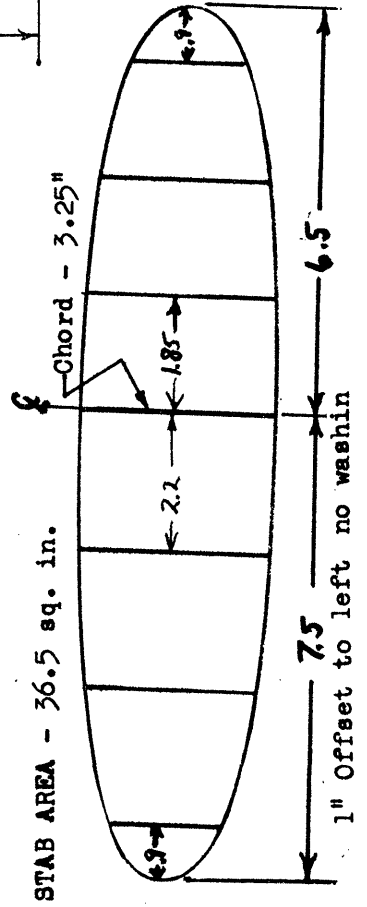


INDOOR PAPER STICK JOE HINDES LOWELLVILLE, OHIO

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



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!

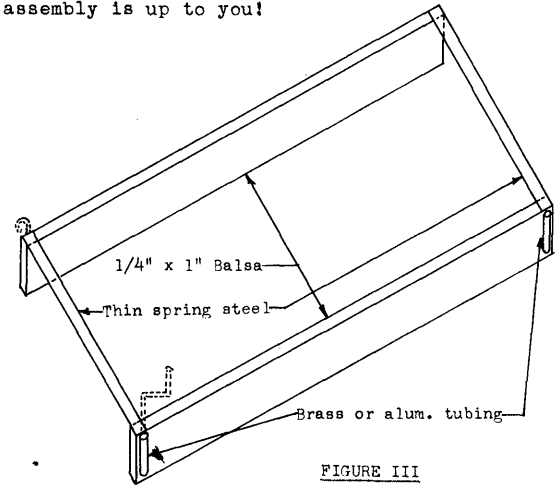


FIGURE III

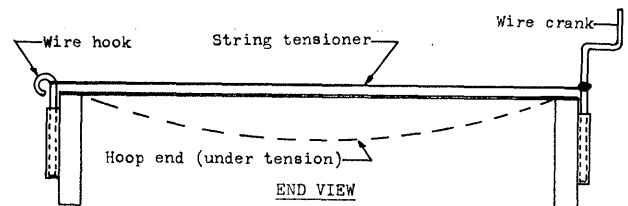


FIGURE IV

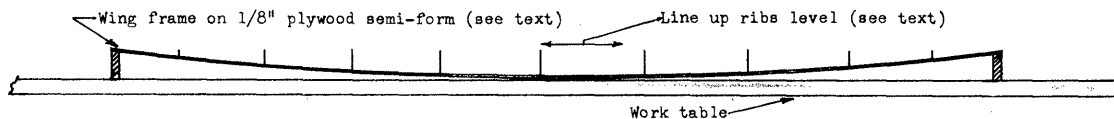


FIGURE I

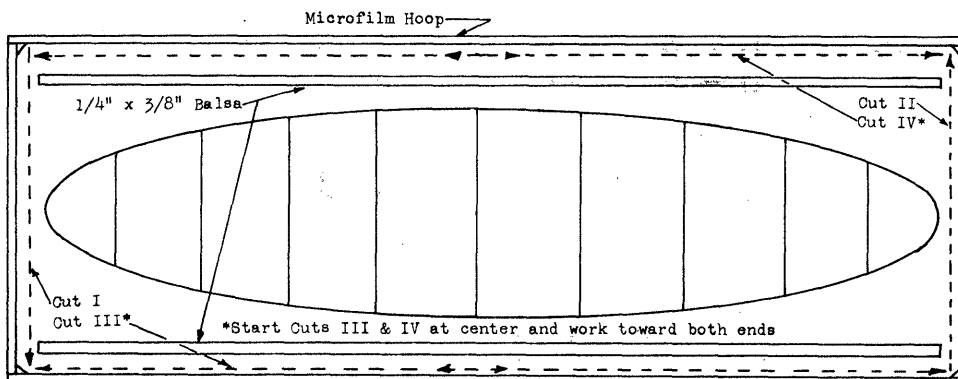
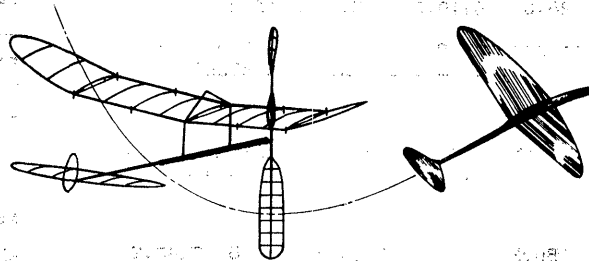


FIGURE II



INDOOR

NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL

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

National Free Flight 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
 Squaresville, Calif.

Dear Bud;

Just to keep you up to date on my most recent re-searches, 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 out to three days, it would still be a model extravaganza without equal. We still have over 30 events and 5 1/2 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 hosts 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."

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 send the names)	(Denver)		0:42.5
	(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 Aeronauts, 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 Siflest, 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.

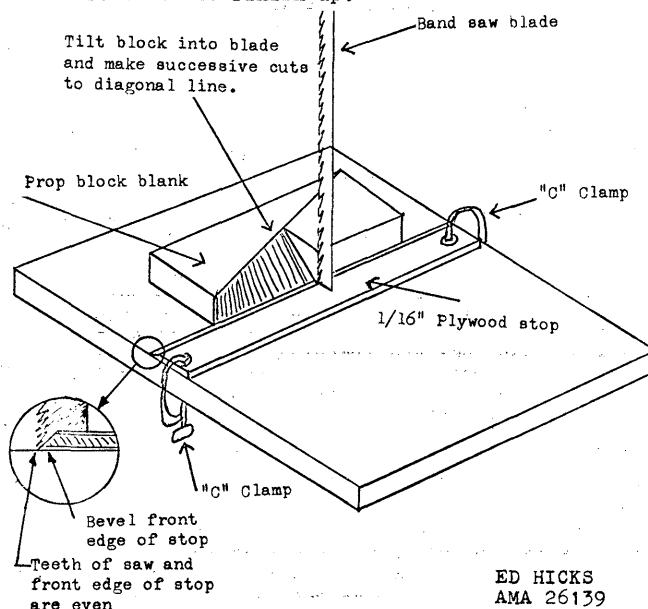
WASHINGTON, D.C.

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 - 3 1/2" 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.

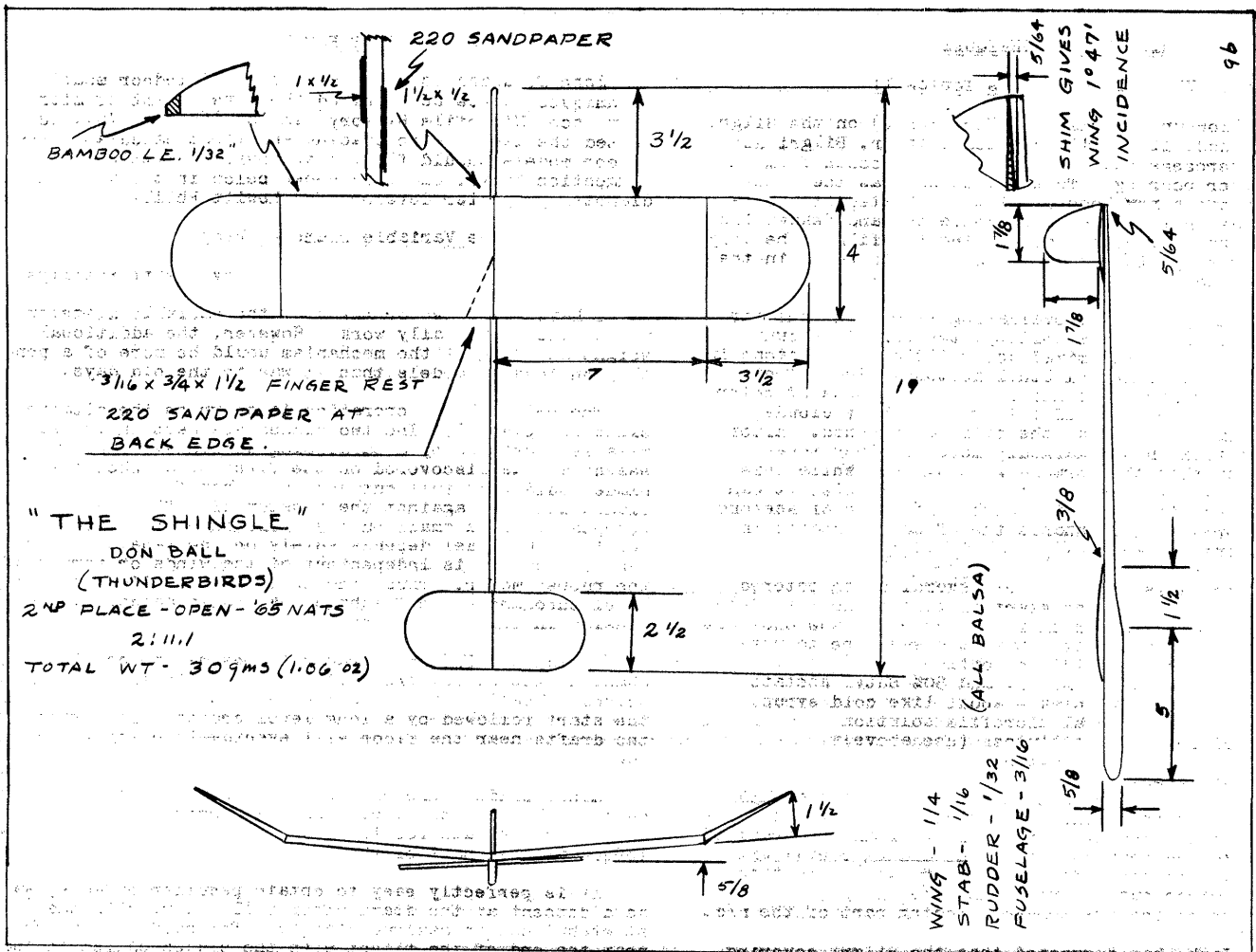
HINTS AND KINKS

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 Outdoor 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 1 1/2-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!

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 Trioresyl 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

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 independent 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.

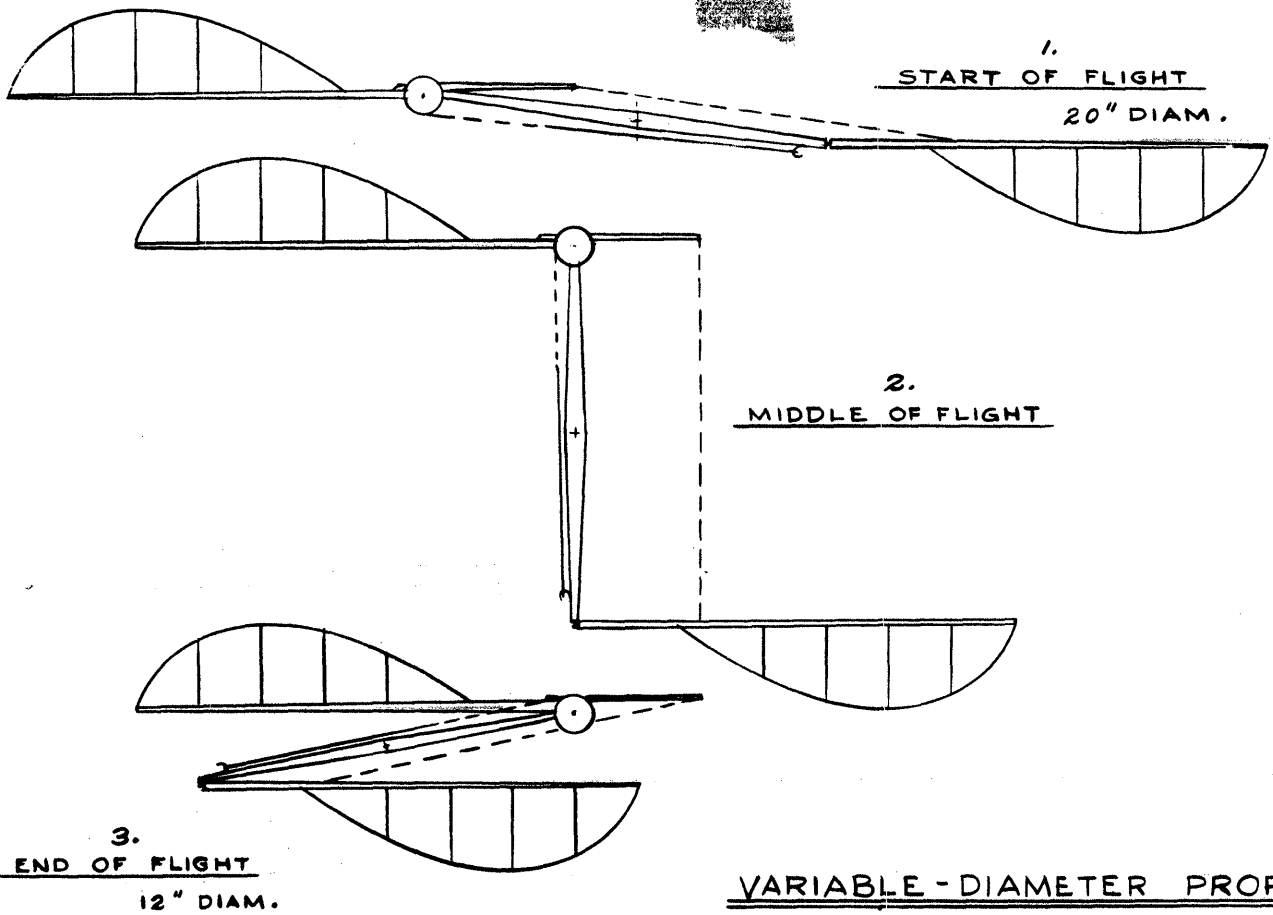
It is perfectly easy to obtain peculiar effects, such as a descent at the start under full power, with the prop stretched out to maximum diameter, followed by a climb near the end of the flight with the blades pulled in and the propeller buzzing around like a beginner's ROG. This condition obviously 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 LABBlubaugh 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.

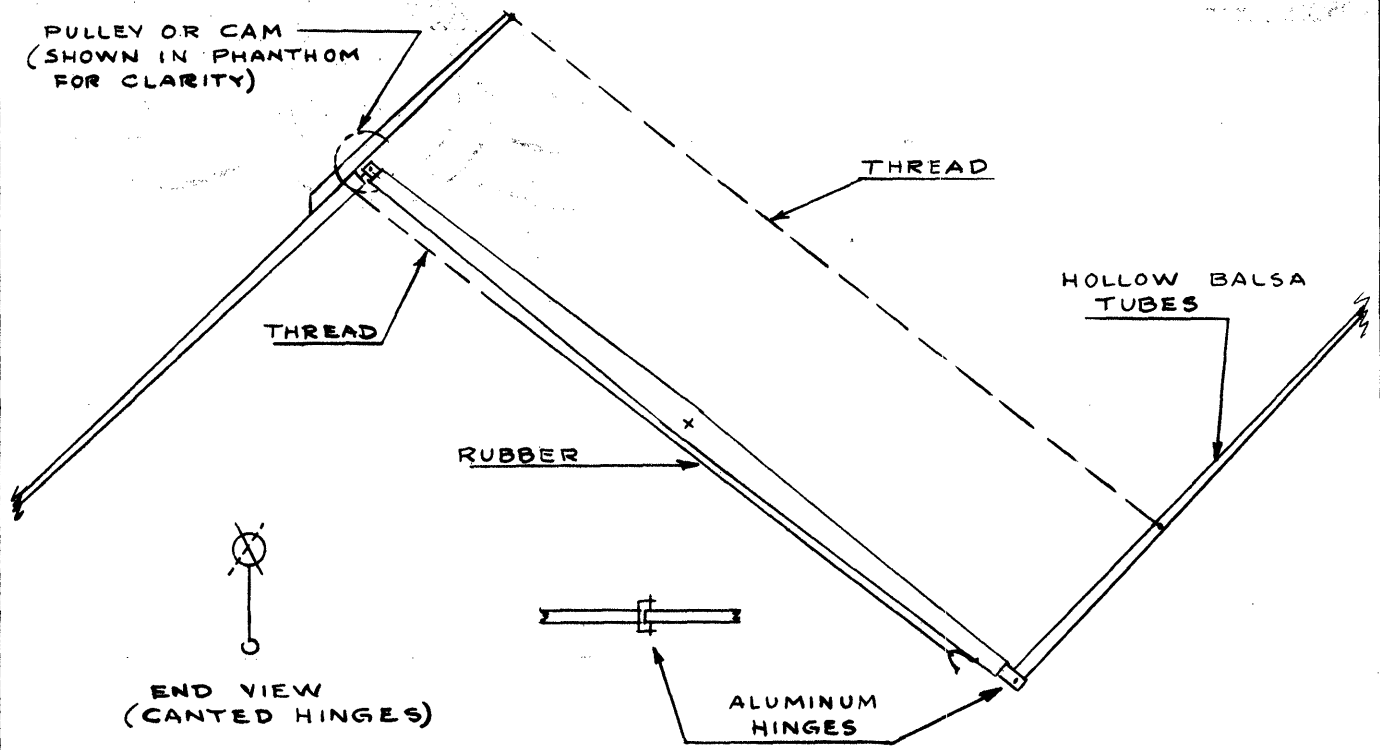
Eric Vogel's most recent glider gave some very good results with a fence; 0:23 from about 20' altitude consistently. The chief limitation of this glider was in the launch, and I believe a very flexible tail boom was the problem here. On my own gliders, those which were the least adaptable to operation 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

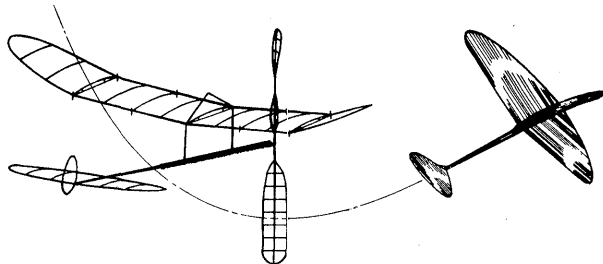
— W. H. PHILLIPS —
HAMPTON - VA.

G.B.



ENLARGED VIEW OF MECHANISM

GB



INDOOR

NEWS and VIEWS

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

****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 small-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?

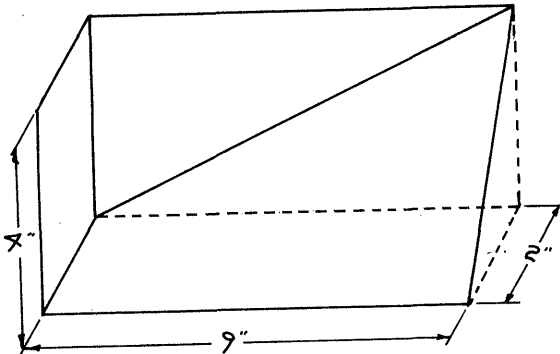
Really, the above questions just scratch the surface. What is really needed is a thorough discussion of the lore that has been generated by indoor modelers since we first started using pirelli. Who will help us out?

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 assault 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.

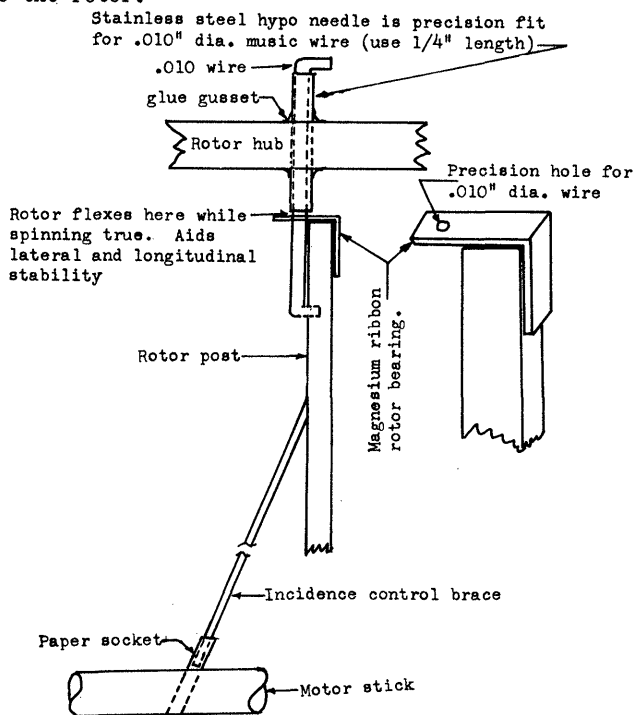
Details of the prop outline are on the plan page, and the prop block dimensions are given in the sketch below.



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 Maxcutors' 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 Belleff 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:

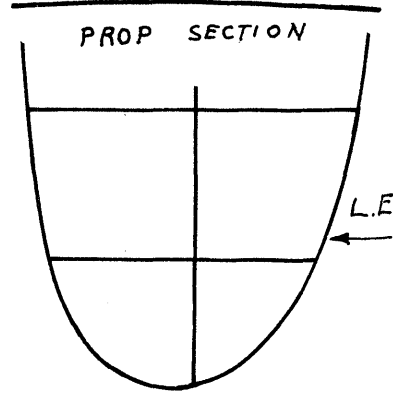
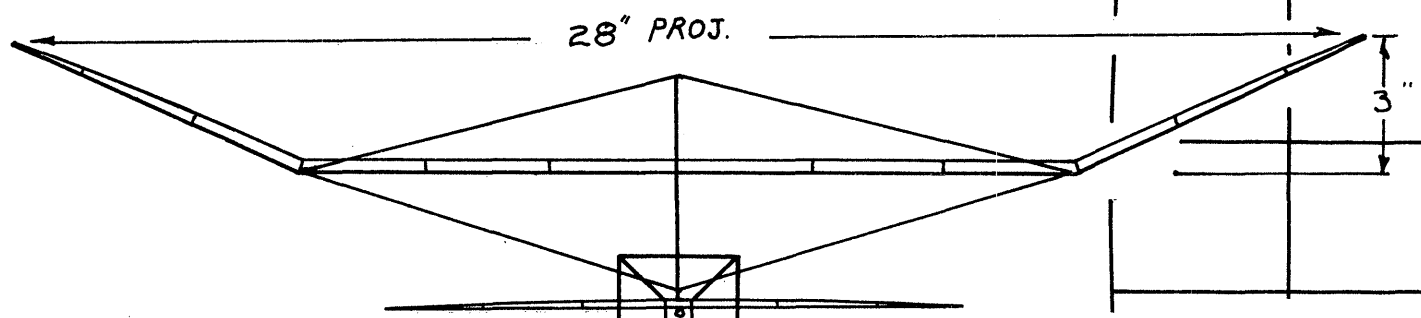
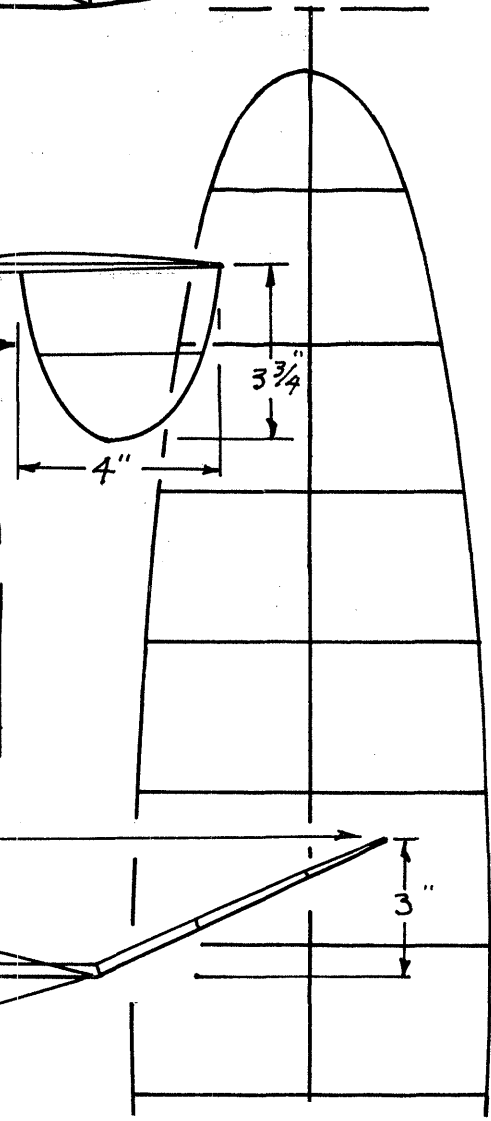
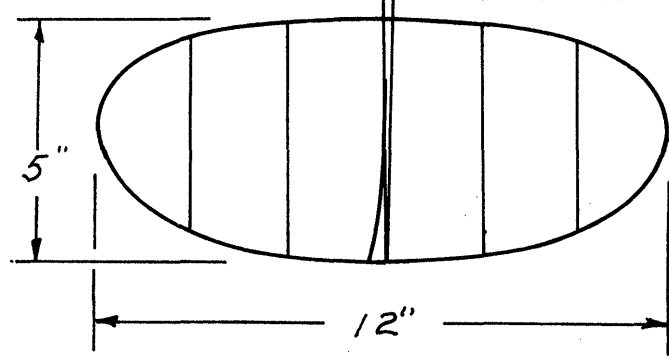
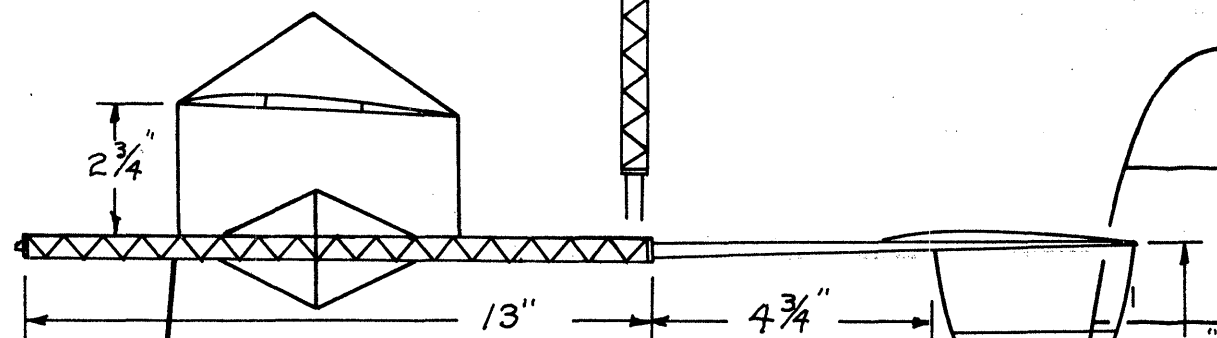
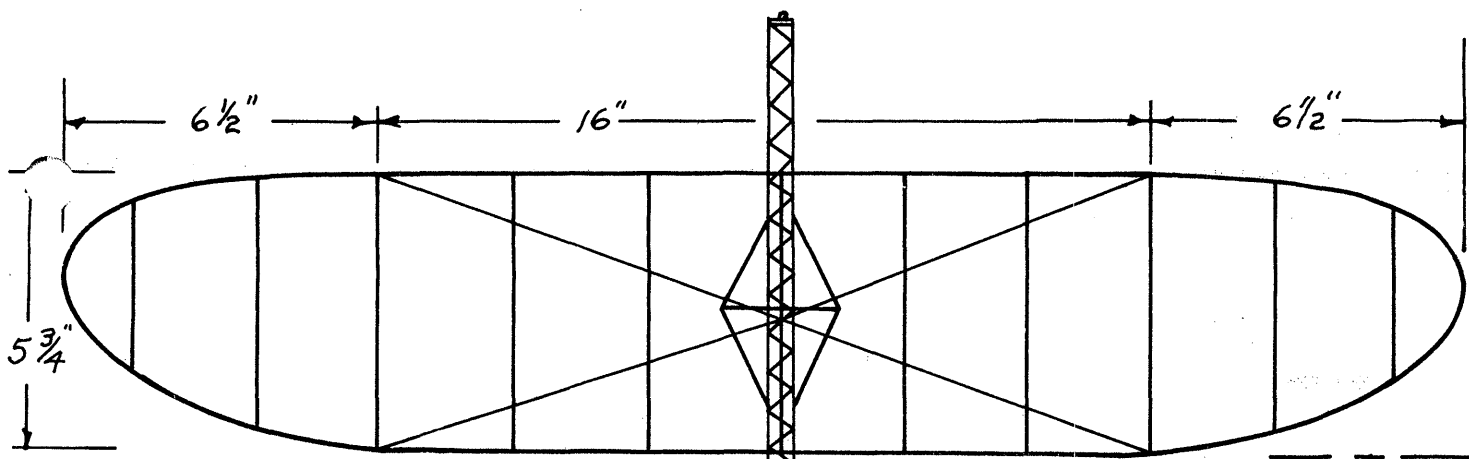
I don't know who actually made Paper Stick an AMA event, but it was flown at the 1955 Nats. The credit for making it an AMA event probably should be divided between Hal Roth (a member of the Oakland Cloud Dusters at the time) and Model Airplane News. If anyone else wants the credit, it's all right with 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 Micro-film?" 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	<u>.037</u>

WING SECTION

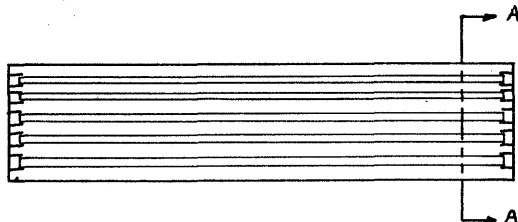
MICROFILM TECHNIQUES

Part VII - Storage Methods

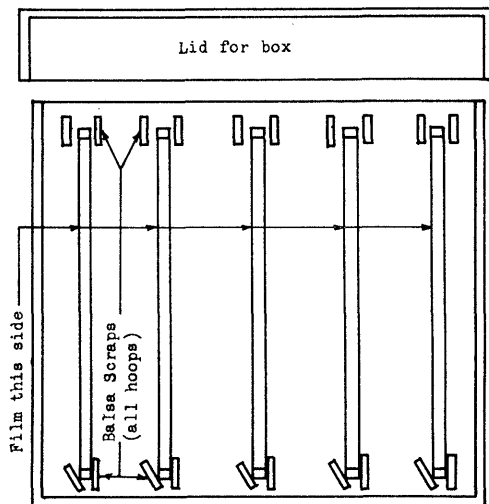
Anyone who builds indoor very much is faced with the problem of storing microfilm. Not only is it wasteful of time to pour only a few sheets at one time, it is a very fortunate builder who can count on getting the exact kind of film he wants, "on demand", every time. Good film doesn't spoil and is usually 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.

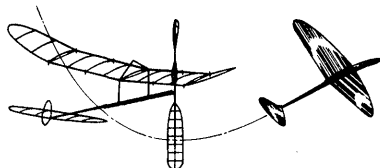
As with other construction jobs, the proper tools are essential. A glass hypodermic syringe with #25 needle is ideal - this size needle uses .008" diameter wire for a stopper. Grind the end of the needle flat and de-burr it so the glue can be applied exactly where it is needed. Of course, glue must be 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!

INDOOR**NEWS 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 Sud 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 Strattnr. 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 HINTSThe 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 taped 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.

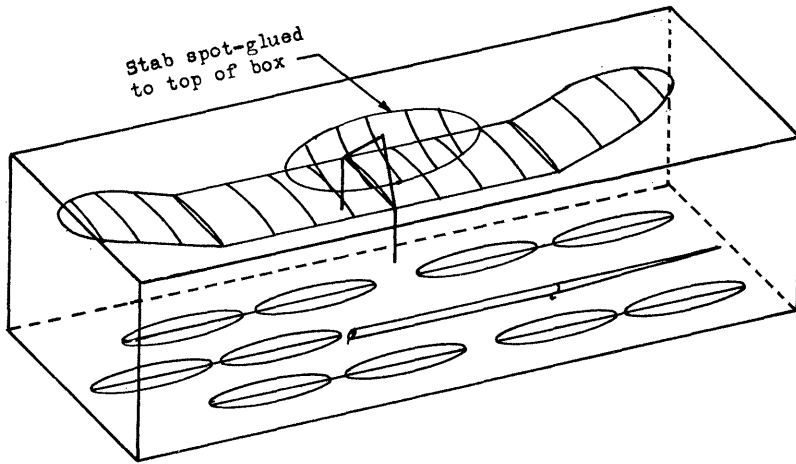


Fig. 1 - John Malkin's Box

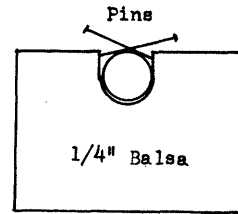


Fig. 2 - Motor Stick Mount

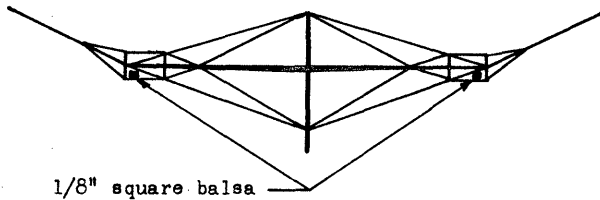


Fig. 3 - Malkin Wing Mount

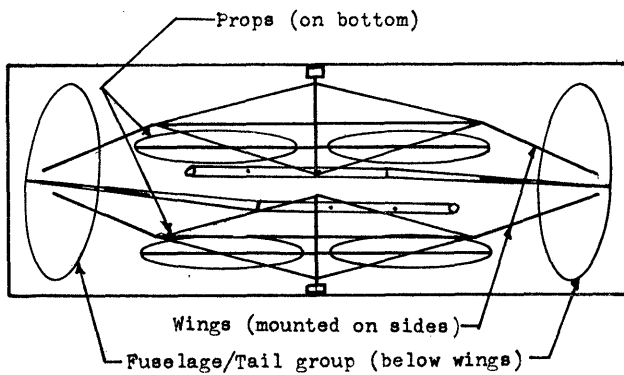
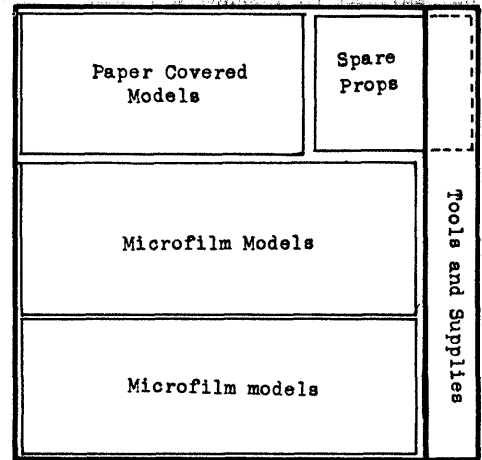


Fig. 5 - Top View of Model Box

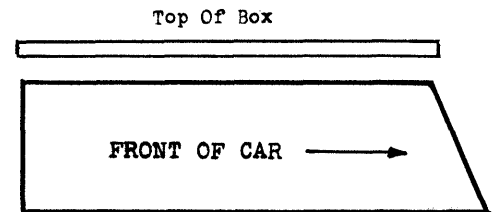


Fig. 4 - Car Top Carrier

A SPECIAL REQUEST

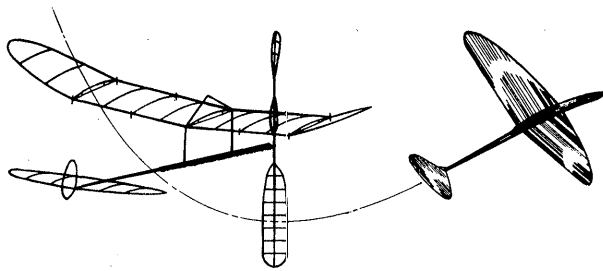
The next (and final) issue of the limited international issue will contain comments about drift, flying techniques in small sites, balloon steering, and adjusting models for high ceilings in lower ceiling sites.

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.

INDOOR**NEWS and VIEWS**

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081



****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 Memberships)
 DALE HACKER
 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 probably 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 microfilm models as they were in 1946. See page 7 of the May 1966 Model Aviation for an order blank.

FAI INDOOR REPORTNew 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, Yugoslavia, 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 TECHNIQUESMicrofilm 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 lengthy, 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 an 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.

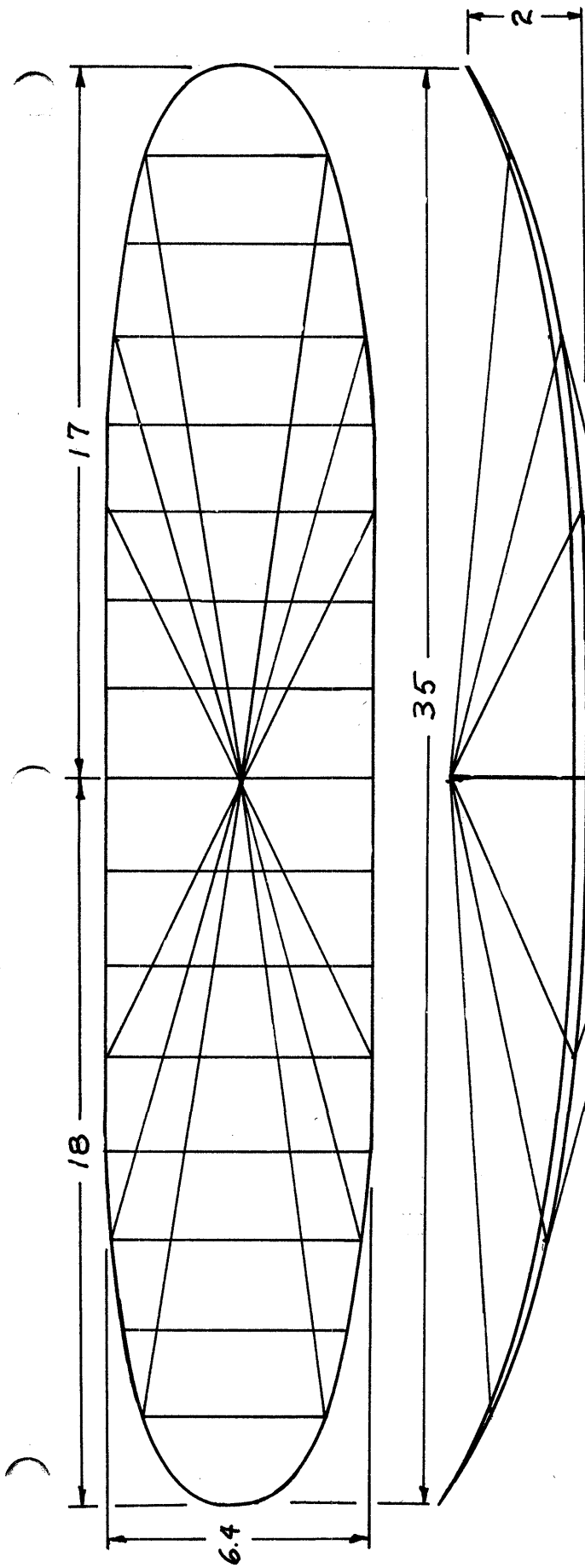
To be effective, bracing must have sufficient tension to absorb flight loads (and some handling loads) and the tension should be equal all over the wing. Too much tension will cause extra compression loading on the spars in damp weather as the wood expands; uneven tension promotes wing warps which appear 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-

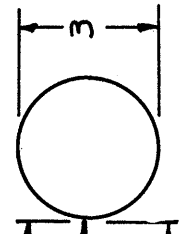
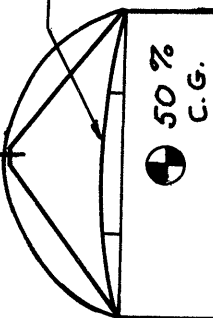
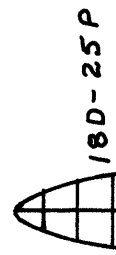
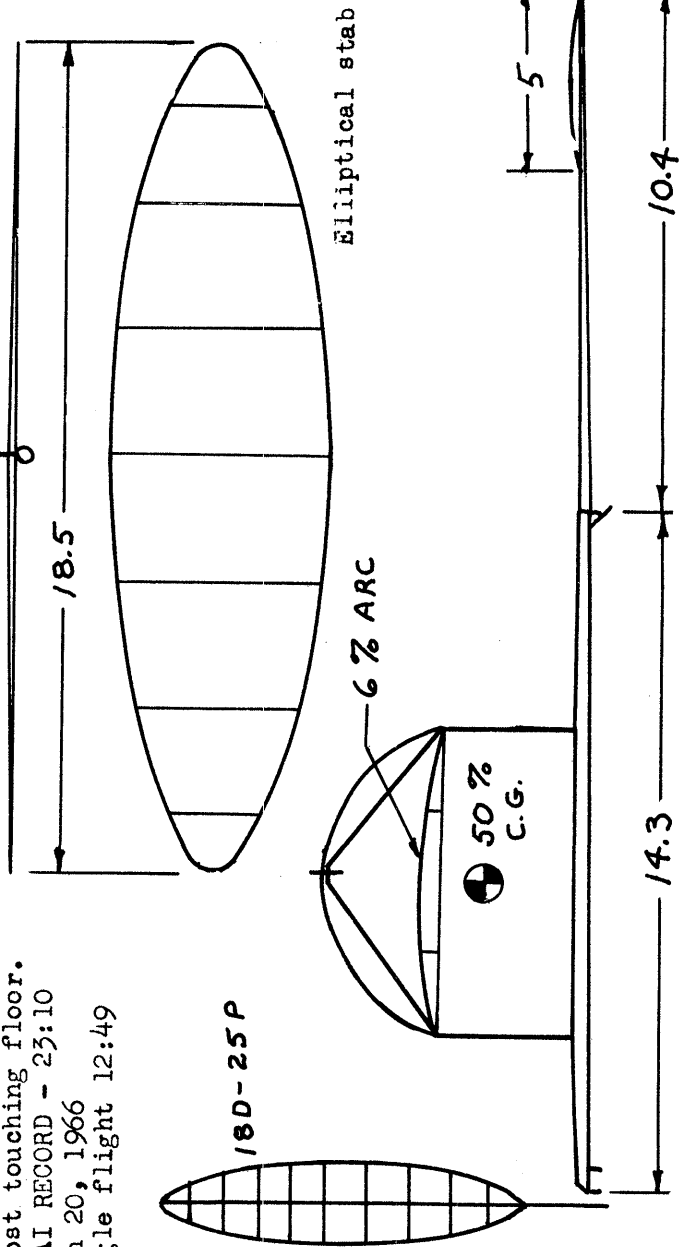
(Cont. on p.4)



Weights	
Fuse & Tail	.021
Wing	.024
Prop	.005
	<u>.049</u>
Rubber	.047
16" loop	.066
Pirelli	1150 Turns

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



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

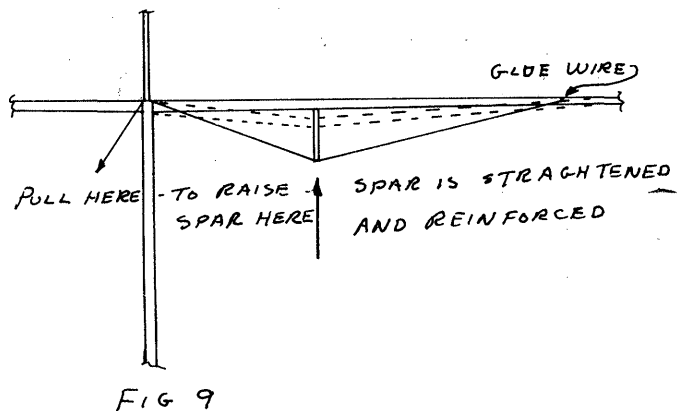
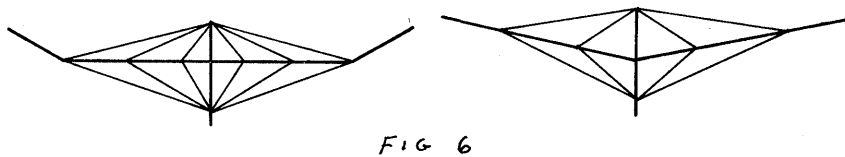
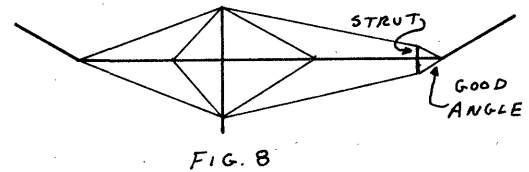
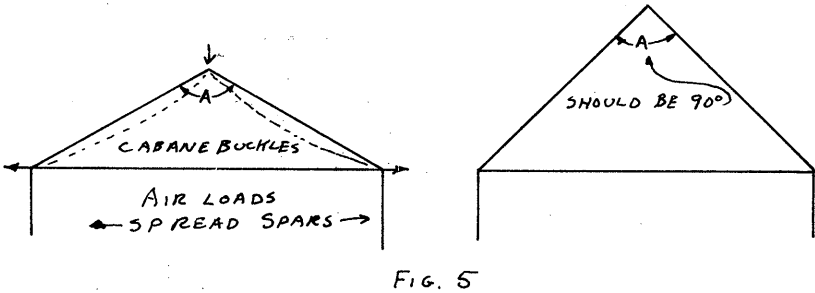
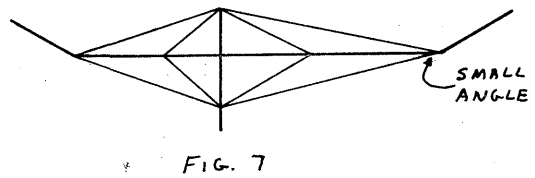
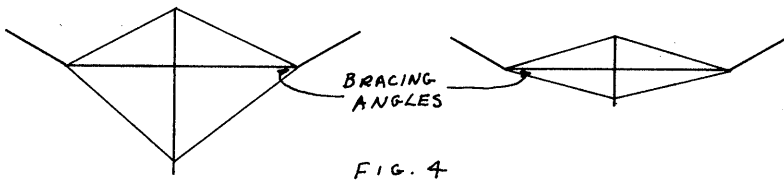
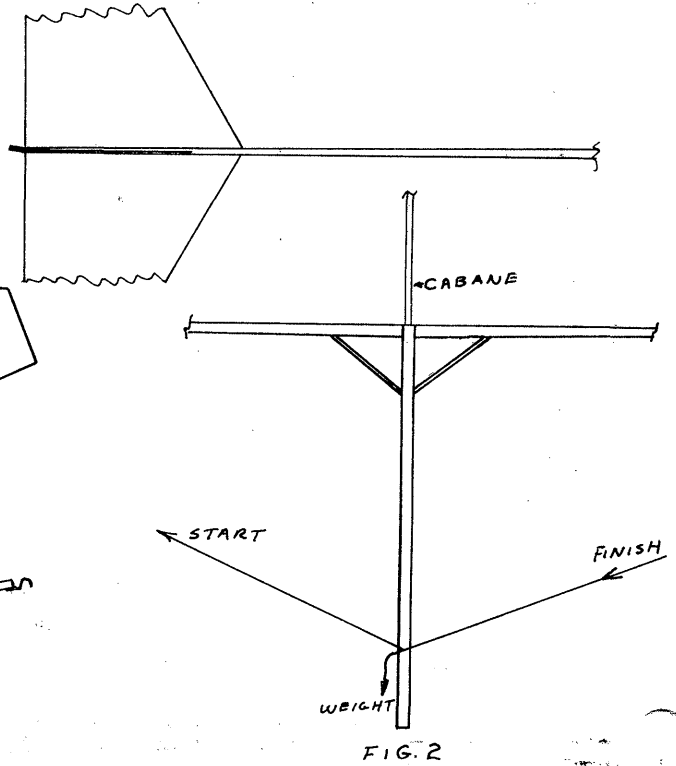
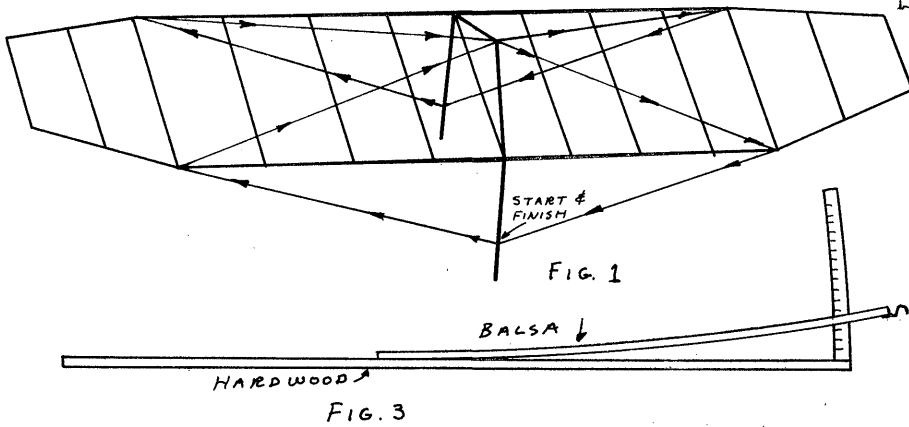
Ed Whitten is responsible for the entire presentation on page 5 - I am very grateful to him for gathering the material, authoring the commentary and printing the pages used. This is indeed a refreshing glimpse into the past!

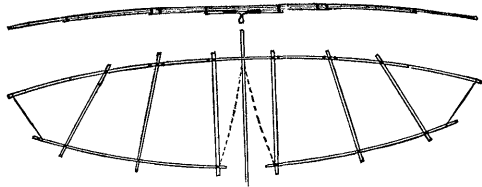
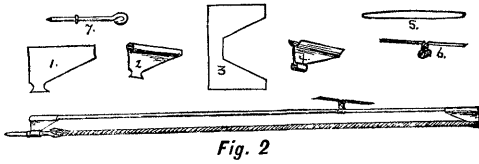
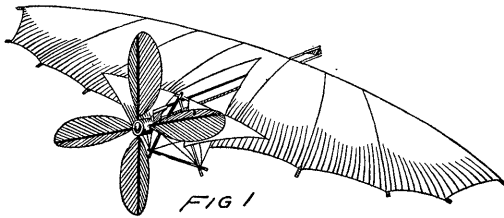
Ponder awhile Ed's last comment and ask yourself when the Golden Age of modeling really is (or was). Ed and I agree that it is now. Certainly the models are better, we have a greater variety and availability of supplies, and better communication to enable us to share our new methods and developments 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 end of the fuselage is sanded thin (see sketch), the fuselage can be turned with the fin and will hold the adjustment.





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?

planes...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.

Primitive?...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".

...Progress marched on.. and maybe models were even ahead of man carrying air-

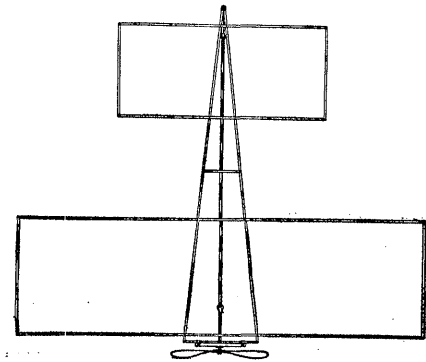


DIAGRAM FOR PLAN OF THE AÉROPLANE ON PAGE 58.

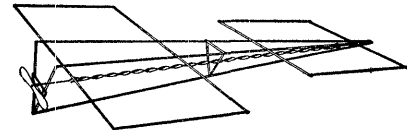
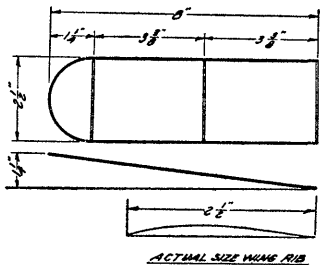


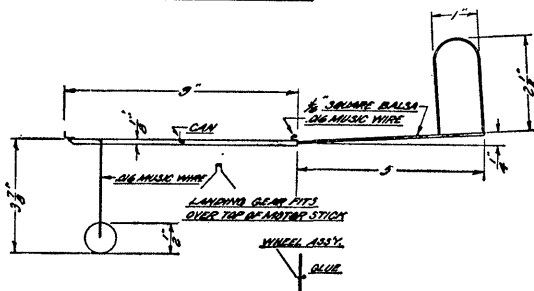
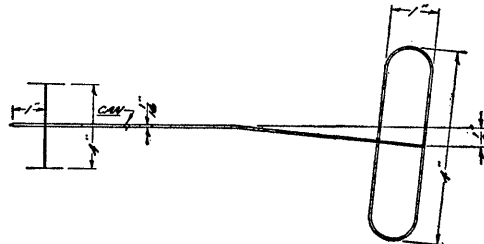
DIAGRAM - SHOWN IN PERSPECTIVE. PLATE A.

....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 heroes to us all asFay 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



PROPELLER BLOCK

* * *

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 your interest and productivity is at a peak is your Golden Age?

INDOOR

NEWS and VIEWS

\$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

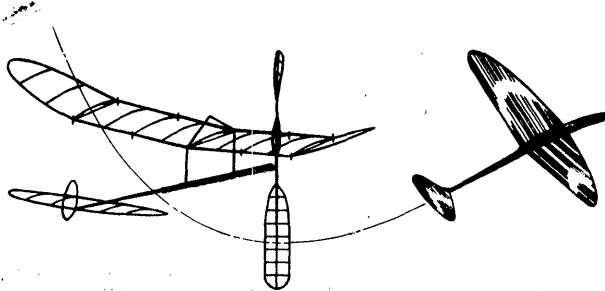
Entry List

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.



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

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 Knoch is reported to be the winner of the Yugoslavian 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.

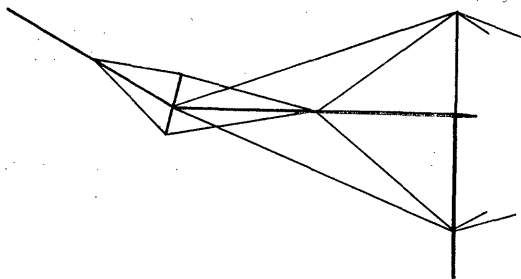


Fig. 1

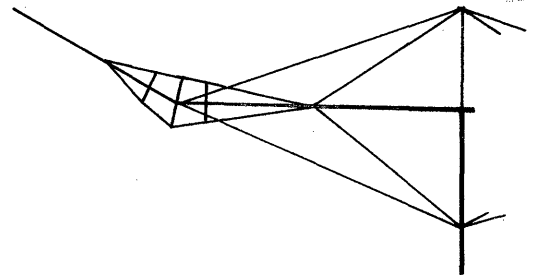
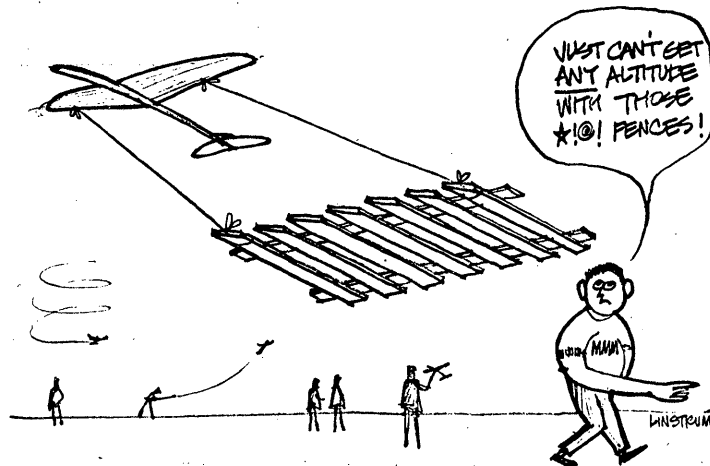


Fig. 2

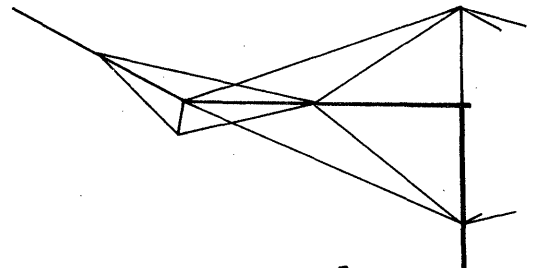


Fig. 3

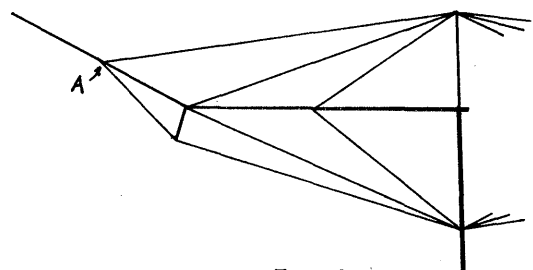


Fig. 4

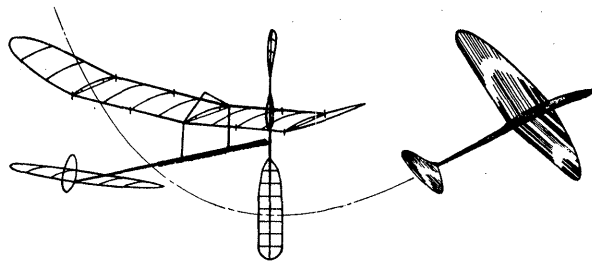
SORRY, FOLKS

That's all there was ready when the balloon went up! Twenty-four hours ago, I received notice about the change in departure 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!

INDOOR

NEWS and VIEWS

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

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	21:03	21:03	26:17	5:45	60:23
3.	Reino Hyvarinen	Finland	1:09	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 Strattnr	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 't speak Hungarian! Further, try to explain to the 'xious 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 Aero-club 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 Gabriel; 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 Strattnet'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

<u>Indoor Cabin</u>		<u>Indoor HLG</u>		<u>Indoor Stick</u>		<u>Paper Stick</u>	
<u>Junior</u>		<u>Junior</u>		<u>Junior</u>		<u>Junior</u>	
1. Randy Richmond	7:26.0	1. A. Markiewicz	1:46.1	1. Randy Richmond	14:39.6	1. Randy Richmond	14:47.2
2. Ronnie Ganser	6:51.0	2. Randy Richmond	1:36.0	2. Linda Randolph	14:35.4	2. Linda Randolph	13:35.0
3. Susan Weisenbach	4:05.0	3. Jim Thornberry	1:32.0	3. Ronnie Ganser	13:51.8	3. Jim Thornberry	13:03.6
4. Michael Wood	3:25.0	4. Thomas Mills	1:22.2	4. Jim Thornberry	13:31.0	4. Ronnie Ganser	10:28.2
5. Bruce Paillet	3:00.4	5. G. Neighbors	1:21.2	5. A. Markiewicz	12:15.0	5. Susan Weisenbach	7:26.6
6. Barry Paillet	2:21.8	6. Michael DeJaeger	1:17.8	6. Kristi Tenny	8:25.8	6. Patrick Wood	6:51.4
7. Patrick Wood	1:49.0	7. Allen Nixon	1:14.5	7. William Schlarb	5:19.3	7. William Schlarb	6:11.0
8. Thomas Mills	1:10.0	8. Paul Hooper	0:56.5	8. Susan Weisenbach	4:11.8	8. Allen Nixon	5:46.0
		9. James Mills	0:53.1			9. Barry Paillet	4:19.4
		10. Daniel Frick	0:48.9			10. Bruce Paillet	4:18.0
<u>Senior</u>		<u>Senior</u>		<u>Senior</u>		<u>Senior</u>	
1. David Erbach	9:45.0	1. Dennis Kargol	1:57.8	1. David Erbach	18:08.2	1. David Erbach	9:15.0
2. Louis Joyner	0:21.0	2. Henry Nixon	1:23.2	2. Billy Haught	13:42.2	2. Tim Vom York	8:19.2
3. Dennis Kargol	0:02.4	3. Louis Joyner	1:21.8	3. Dennis Kargol	13:24.2	3. Henry Nixon, Jr.	6:04.2
4. Geoffrey Sauter	0:01.0	4. Billy Haught	1:20.0	4. Tim Von York	12:04.5	4. Geoffrey Sauter	5:58.2
		5. John Manczuk	1:16.6	5. Geoffrey Sauter	10:45.0	5. Dennis Kargol	3:33.0
<u>Open</u>		<u>Open</u>		<u>Open</u>		<u>Open</u>	
1. Al Rohrbaugh	17:51.2	1. Robert Watson	2:01.2	1. Bob Randolph	27:26.6	1. Ed Stoll	18:27.0
2. Charlie Sotich	16:30.6	2. Bernard Boehm	1:53.3	2. Charlie Sotich	23:03.8	2. Bob Randolph	17:25.8
3. Ronald Ganser	15:18.8	3. Bob Larsh	1:50.8	3. Ed Stoll	21:46.8	3. Phil Klintworth	16:20.0
4. Jim Richmond	10:33.0	4. Ron Higgs	1:49.6	4. Curtis Janke	19:57.2	4. Hardy Brodersen	15:30.0
5. Bill Bigge	10:30.4	5. Larry Miller	1:48.6	5. Phil Klintworth	19:42.2	5. Bob Yurkowski	14:30.4
6. Walter Erbach	9:48.6	6. Bob Sifleet	1:48.2	6. Chuck Wiechard	19:33.2	6. Wally Mumper	14:20.4
7. Joe Matulis	3:52.0	7. Phil Klintworth	1:46.6	7. Al Rohrbaugh	19:15.0	7. Jim Richmond	14:03.2
8. Dick Ganslen	2:13.2	8. Jim Richmond	1:45.4	8. Gerald Skrjanc	19:10.4	8. Al Rohrbaugh	13:50.0
		9. Donald Reed	1:39.4	9. Bud Tenny	18:37.8	9. Charlie Sotich	12:49.0
		10. Glenn Lee	1:37.8	10. C. V. Russo	17:06.6	10. Ed Collins	11:24.4

INDOOR WORLD CHAMPIONSHIP
 Photos by Bud Tenny and Manfred Koller



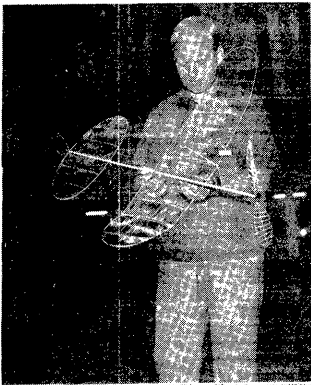
Teodor Strasberger - Yugoslavia



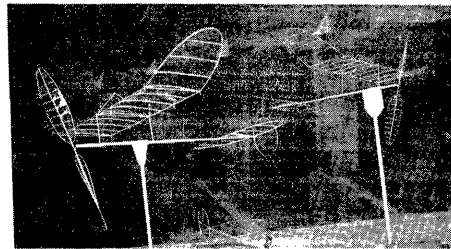
Zoltan Oscodi - Hungary



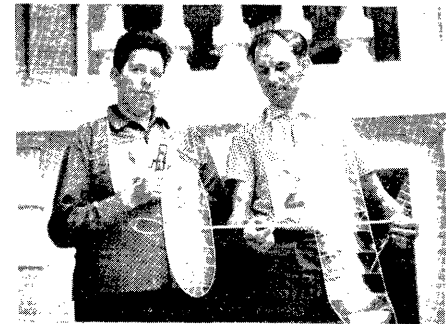
Josef Gabris - Czechoslovakia



Jiri 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 Interpreter - (l. to r.):
 Bud Tenny, Ester Laigo, Bud Romak, Joe Bilgri, Frank Cummings



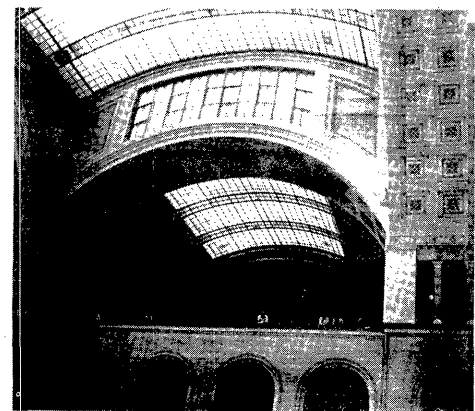
Manfred Koller - Austria



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 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 early hours of rubber; the Tenny family's two entries managed to account for three of these. Actually, after the Kossuth University site (see World 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



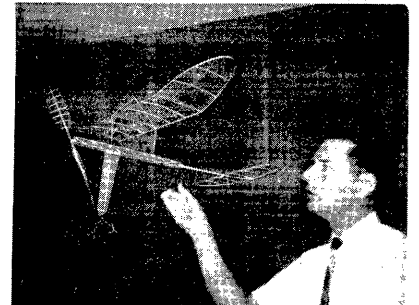
Bruce Paillet winds his Cabin Model
Exploding flashbulb shatters nerves but not model!



Patrick Wood - Jr. Cabin



Family Team
Clarence Mills; Sylvia and Clarence, Jr.



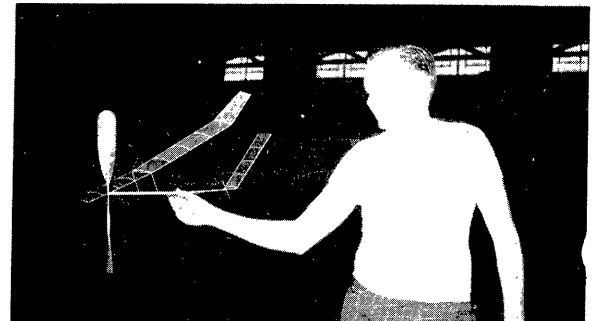
Jim Richmond and Cabin



Ron Ganser and Scale Model



Paul Crowley winds for
Phil Klintworth



Bob Yurkowski and V-tail Paper Stick

INDOOR

NEWS and VIEWS

\$2/ YEAR NIMAS DUES \$1/ YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

****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.

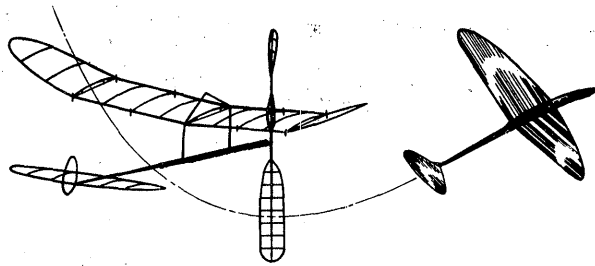
NIMAS Awards

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 Questionnaire 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.

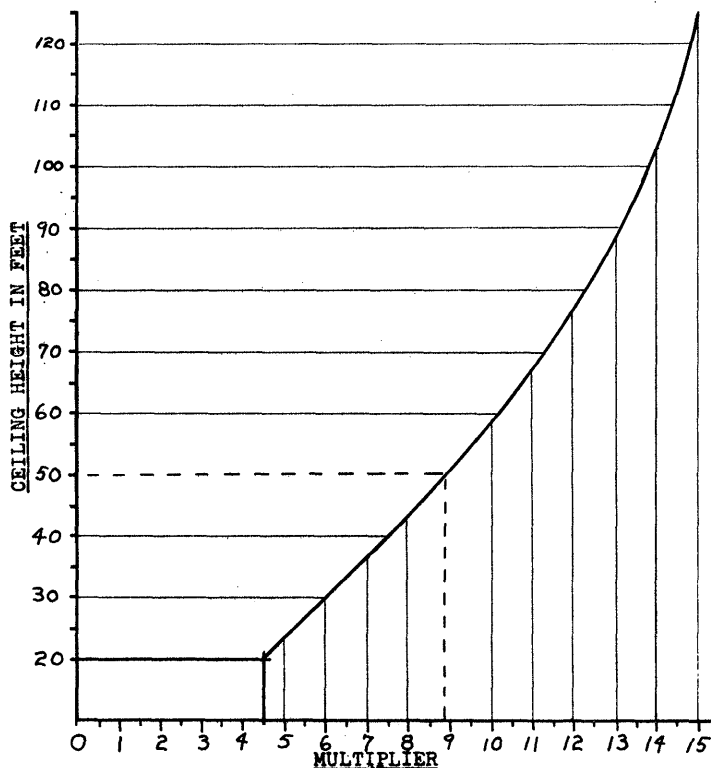
If you favor these proposals (or do not like them), contact your Dist. member of the FFEB and tell him how you would like for him to vote. It is important that you respond immediately, since the voting deadline is Nov. 1, 1966. If these pass on a one-vote deal, they are to be included in the 1967 Rule 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. ($0:22 \times 1.97 = 0:43.5$)



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 = $\sqrt{35'/20'} = 1.32$. $9:48 \times 1.32 = 12:55$. 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 = $\sqrt{100'/65'} = 1.24$. $13:45 \times 1.24 = 17:03$. 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 under-elevated 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.

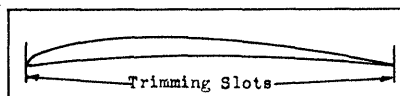
I'm sure that all Cat. I and Cat. II fliers would benefit from a discussion on trim for climb in high ceilings, especially since the next Nats will be in a hangar! What do you look for, and how much advance trimming can be done (in a lower site) before arriving at the hangar?

HINTS AND KINKS

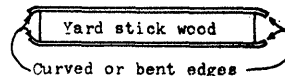
Two By Pfeiffer

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.

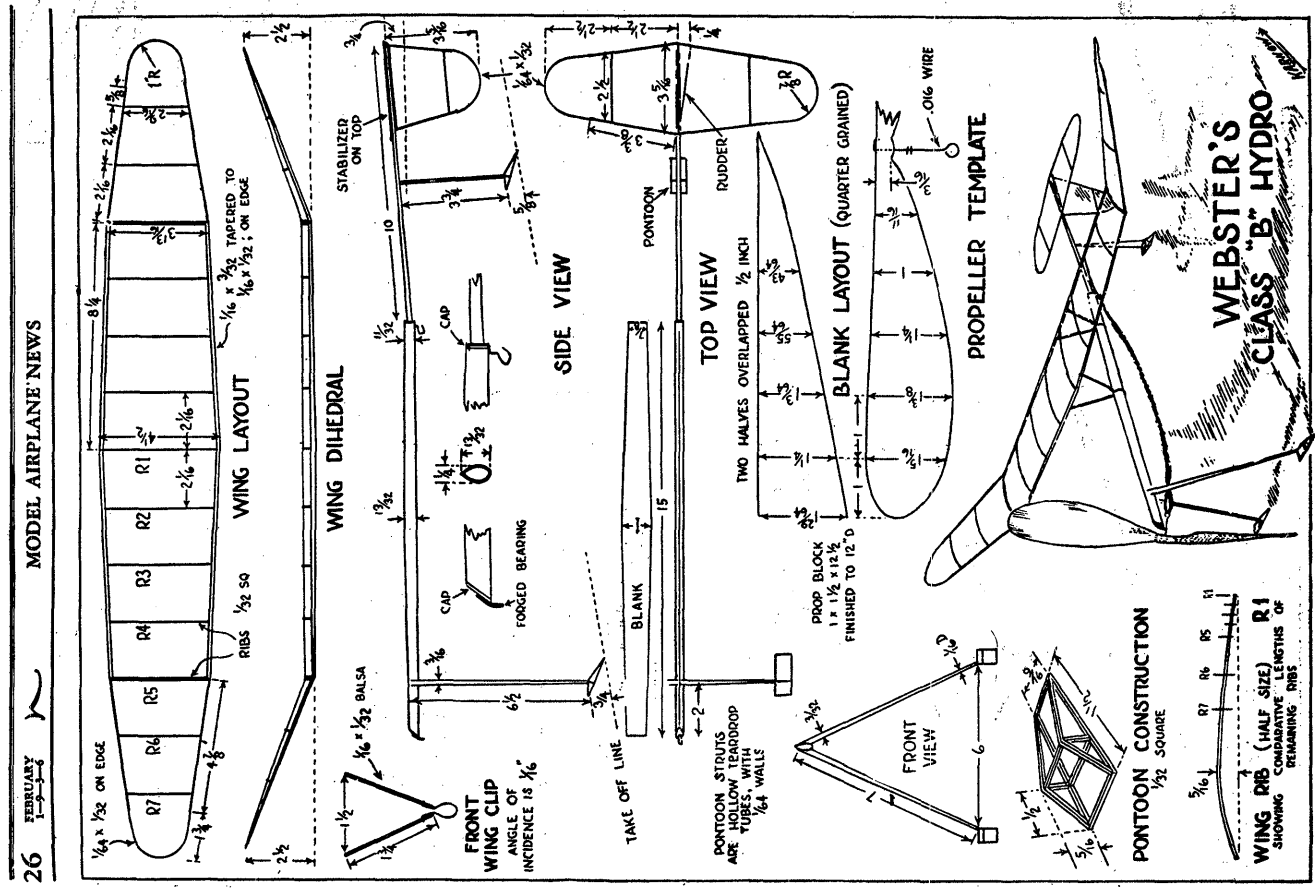
Fig. 3 shows the bracing jig used by Joe Hindes for bracing an elliptical or stressed dihedral wing. Note that the basic form can be the same as the Bilgri jig, and that there are several dihedral props. The outer dihedral braces are left shorter than is needed to hold the wing to the finished dihedral, 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.

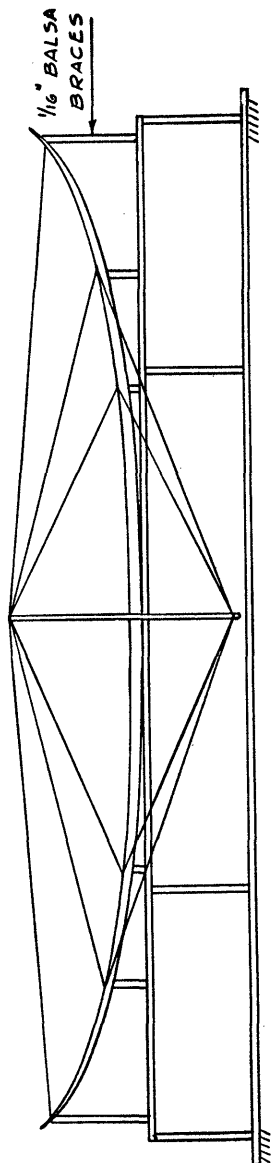
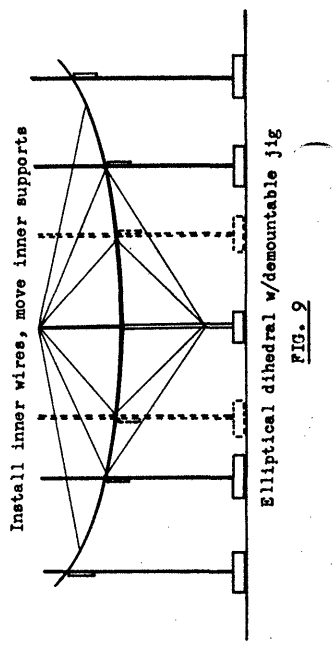
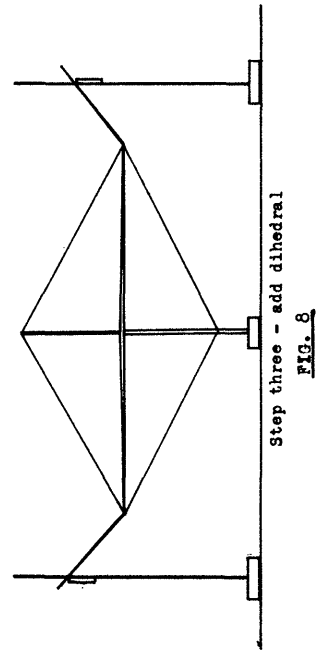
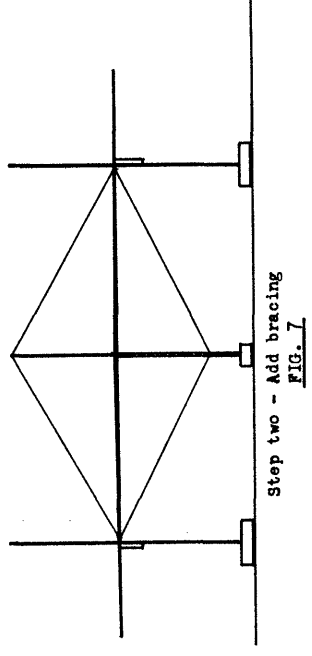
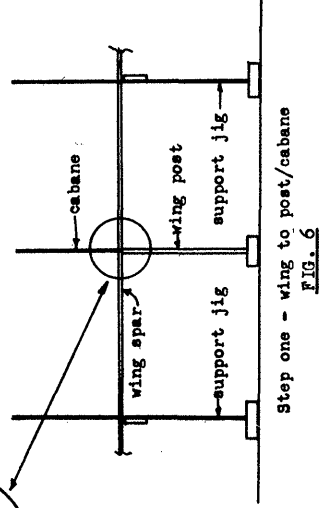
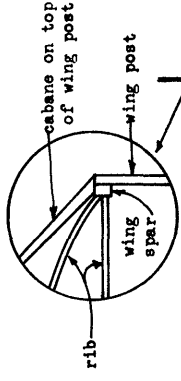
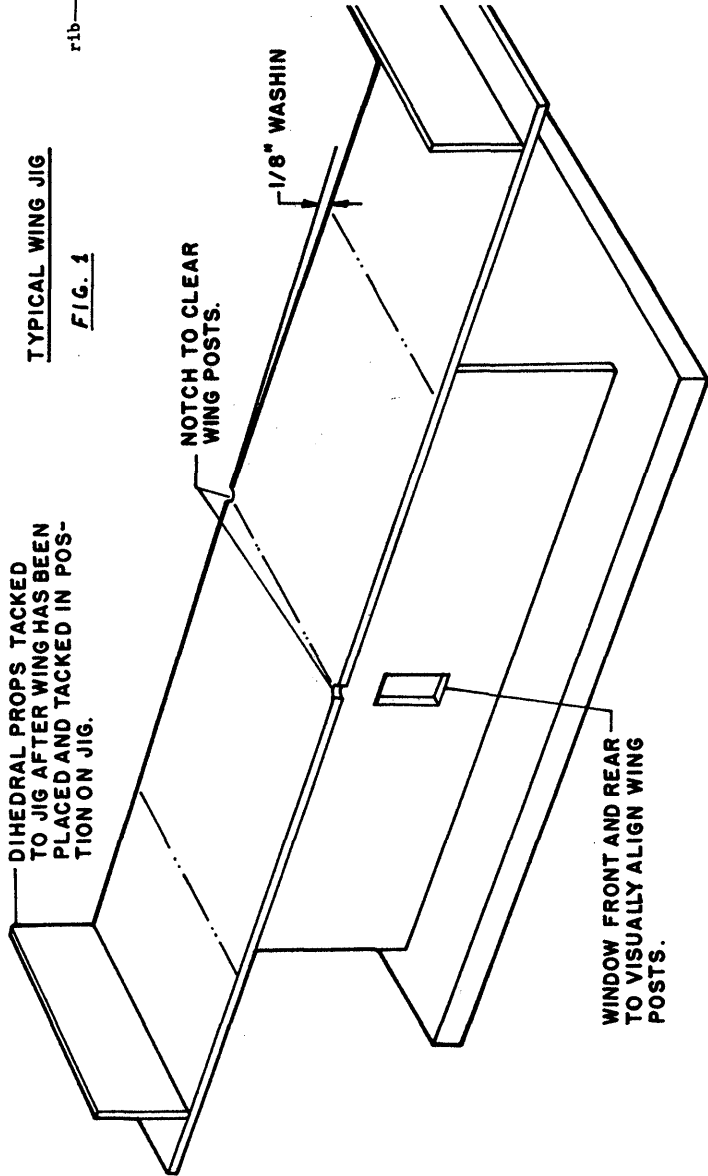
The essential idea behind the Harlan method is to use two tissue sockets properly spaced to support the wing posts; assemble the wing to the posts and brace it - all out "in the air" with removable supports to align the wing and support it during the bracing operation. The following is my adaption of 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 7 1/2" 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.

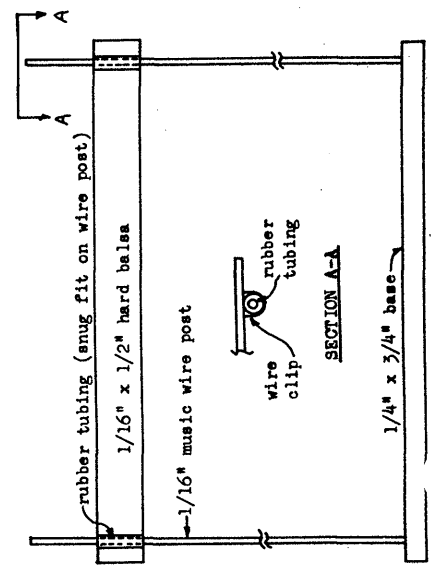
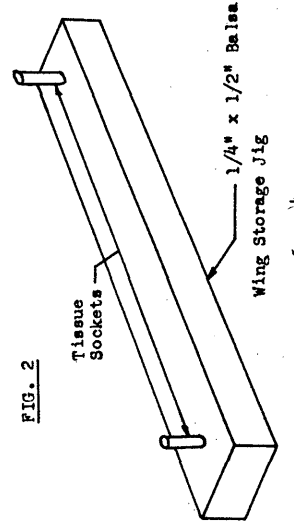
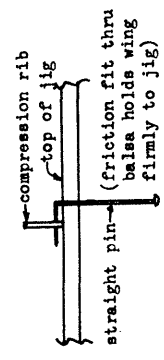
Readers are again reminded that comments and suggestions on this series are encouraged; also questions about anything not made clear or about items not covered. It is likely that bracing for other components besides the wing will be covered in the next installment.



DIHEDRAL PROPS TACKED TO JIG AFTER WING HAS BEEN PLACED AND TACKED IN POSITION ON JIG.



RIGGING FRAME MADE FROM 1/4" PLYWOOD. EDGES SHOULD BE VERY SMOOTH.



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, which that far north starts early and ends late. In return they run 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 development 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:

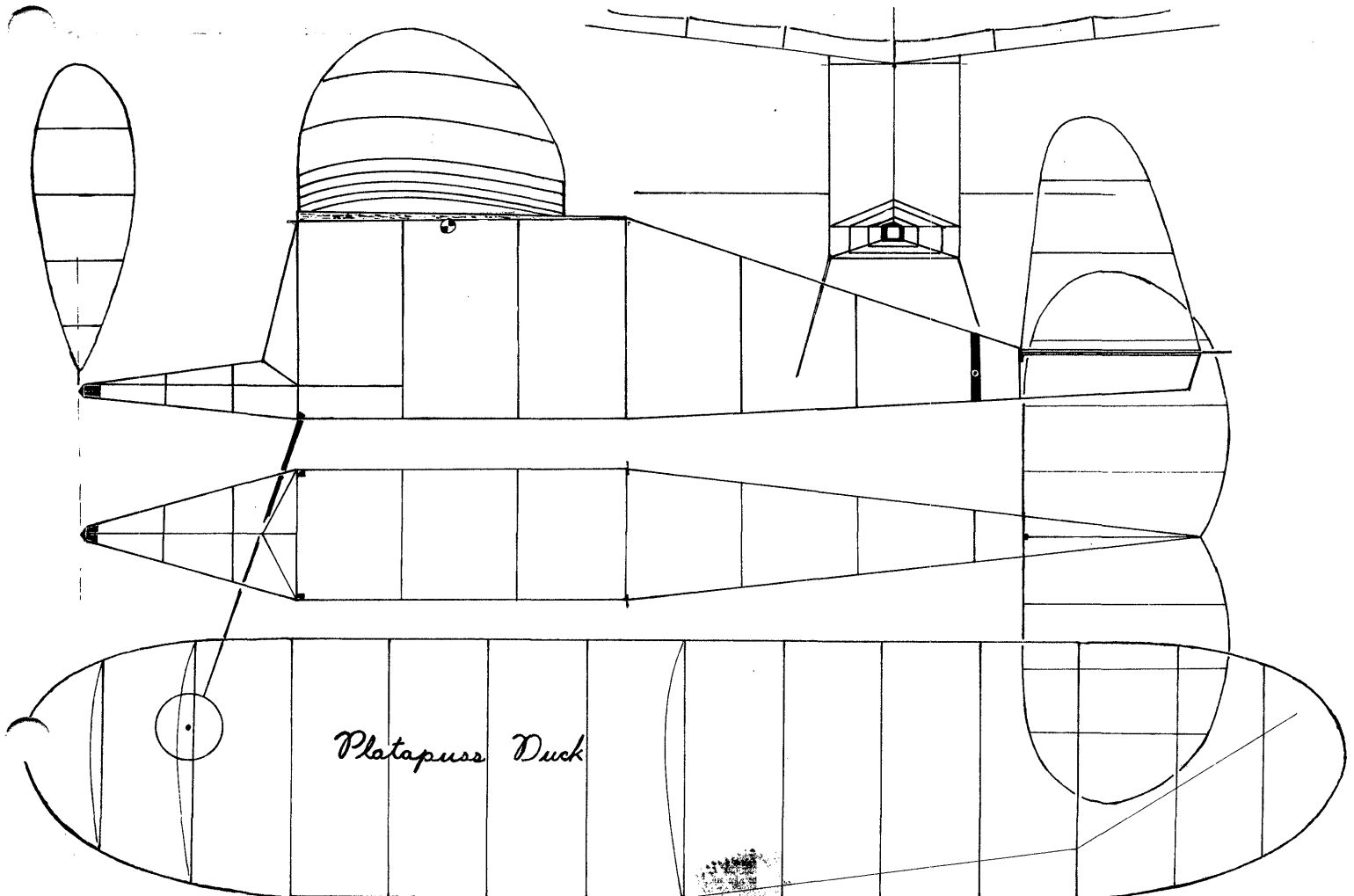
Senior - David Erbach - 5:27.5
Open - John Triolo - 8:08.0

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 Champine (age 9) doing 9:10 in Mic Stick "B" and Richard Whitten (age 7) 3:37.5 in Paper Stick.

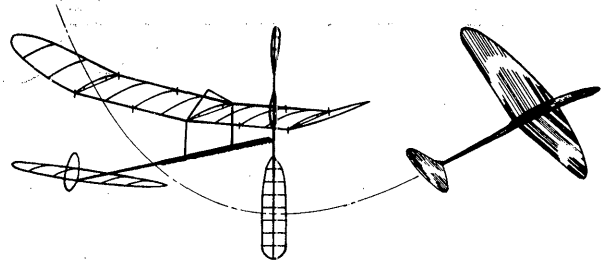
Walt Erbach flew helicopter and autogiro; and Dave Martin, Manny Radoff, Ernie Kopecky and others flew FAI and Paper, but did not turn in times that even included several 30 minute flights. Don Bal made over one minute in HLG, and Ed Franklin put frosting on the cake flying his exact replica of the 1928 indoor stick record holder.



INDOOR**NEWS and VIEWS**

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

****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 en-
 velope 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 pub-
 lication 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
Average labor per issue = 65 hours.	+ 36.68

FAI INDOOR REPORTReport 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 questionnaire 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 conduct-
ed using 65 cm models.

The location for the 1968 Indoor Championship is ten-
 tatively 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 fly-
 ing 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 ProgramLocal 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 con-
 test 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 sig-
 nature 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 reg-
 ular sanctioned AMA Indoor contests, without further pay-
 ment 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 qual-
 ify 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 Orbiters 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 models 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. The 14.5 m ceiling was high enough for Jiri Kalina to turn in 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 1:26 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

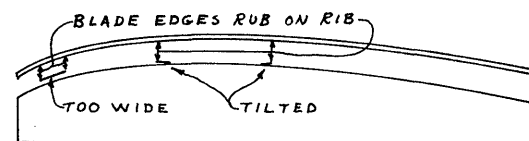


FIG. 2

Hints 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.

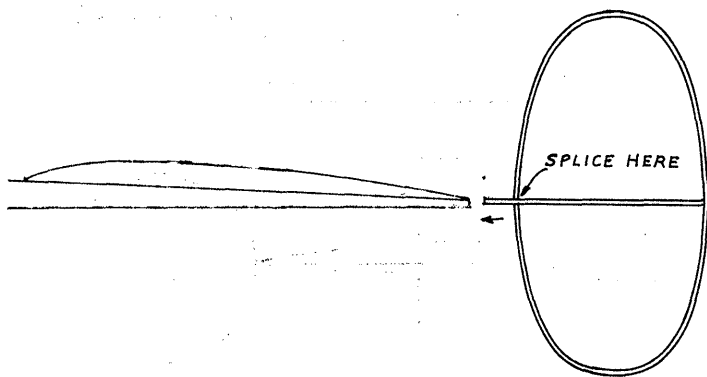


FIG. 1

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.

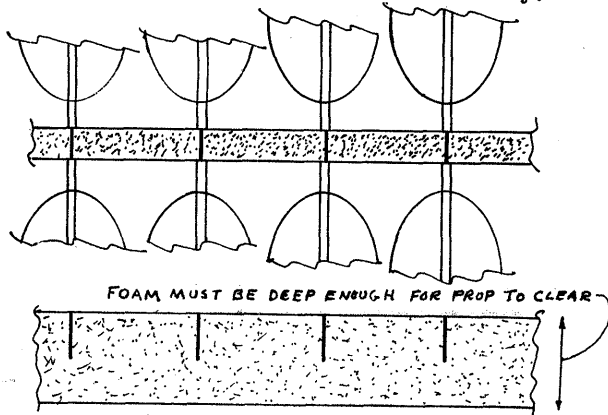
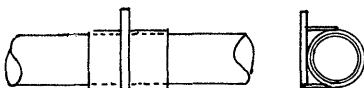


FIG. 2

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.

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 regluing.

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

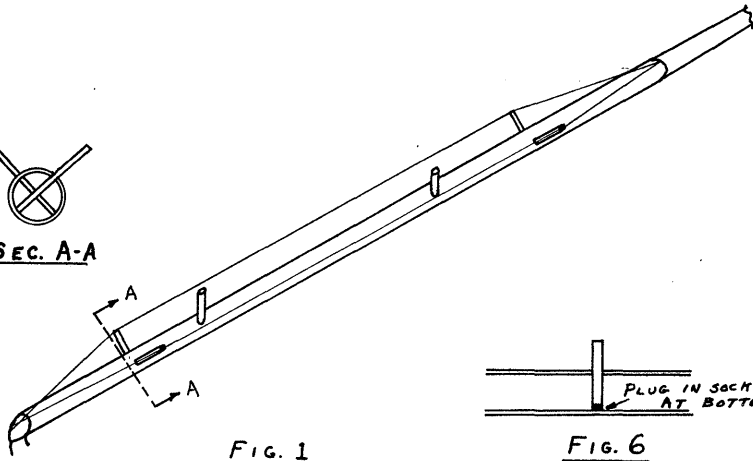


FIG. 1

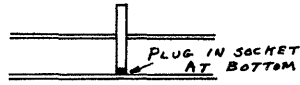


FIG. 6

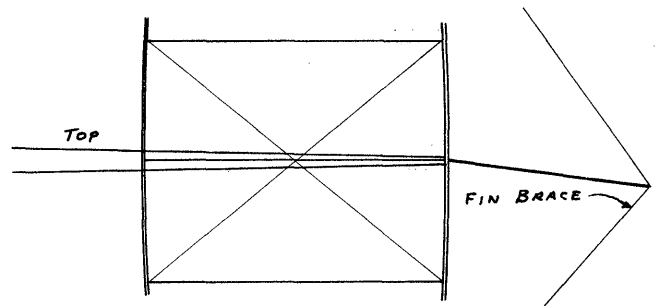


FIG. 8

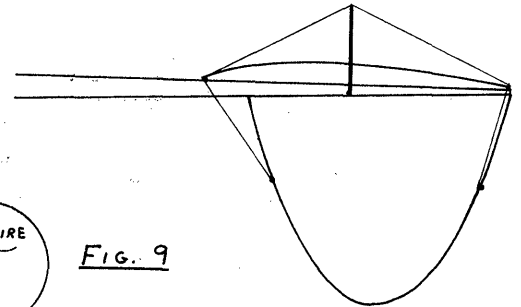
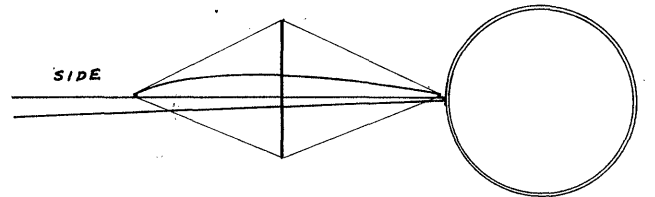


FIG. 9

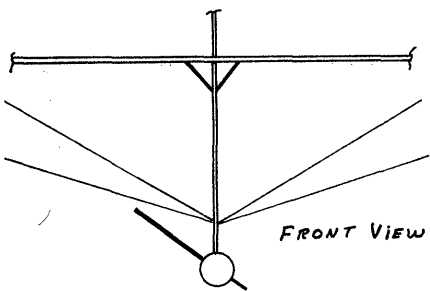


FIG. 3

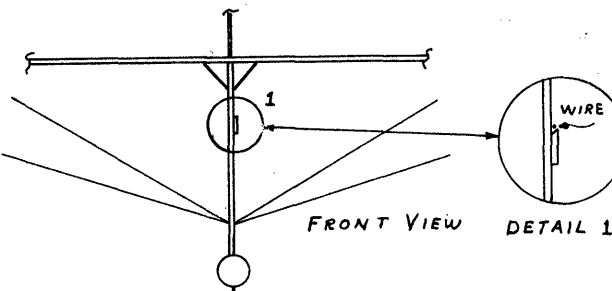


FIG. 5

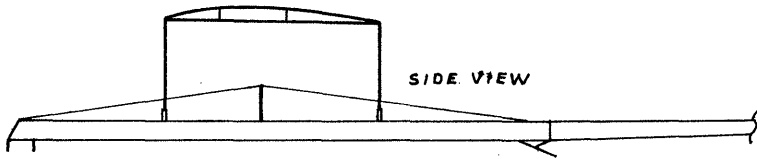


FIG. 2

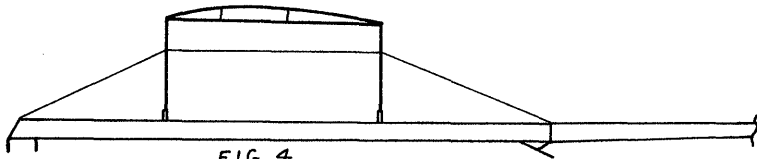


FIG. 4

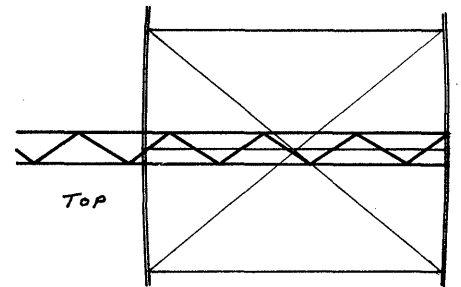


FIG. 10

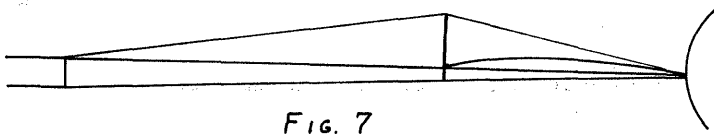
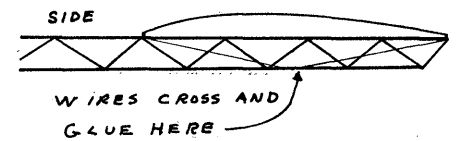


FIG. 7

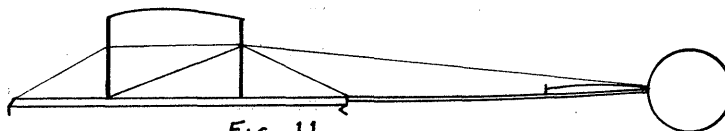


FIG. 11

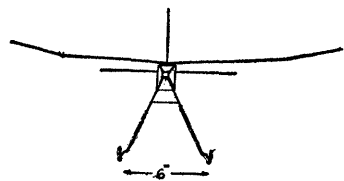
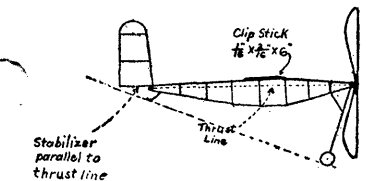
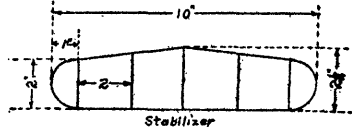
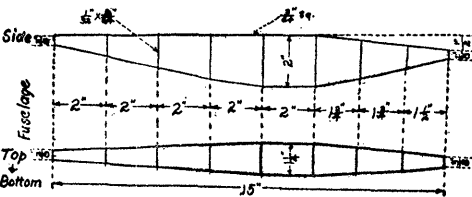
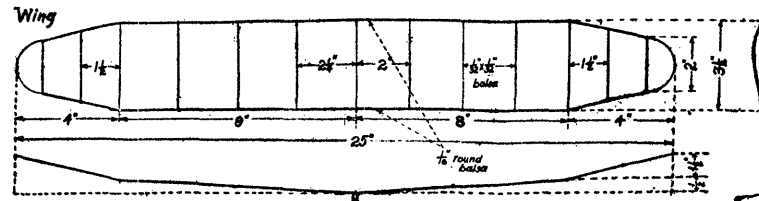
From Among the Rafter's

We note with real interest the continued growth of John Fond'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 proposed, 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 reversible.

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 a 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 authority 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.



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 MODEL DOM BY JEROME MITTEL 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 1 1/4" diam., and a fuselage cross-section equal or better than length squared divided by 100". Span was 25", prop 12" diam. and fuselage 'box' 1 1/4 x 2 x 2.

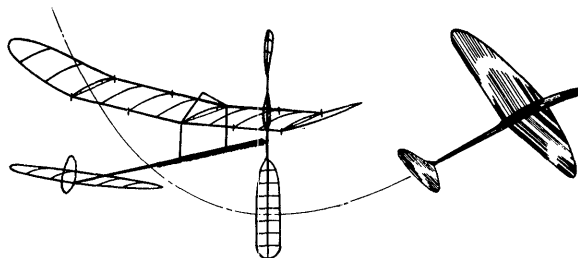
Albert B. Schwarzkopf, Jr.'s (Norfolk) "Indoor Commercial" (plan also missing) had a 10" prop and flew 2 1/2-3 1/2 minutes..... James Shield (Detroit) described his as an "Indoor Commercial Model Conforming to the Wakefield Regulations". It had a 20" span with a fuselage 'box' measuring 1-5/16 x 2 x 2 1/2. 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 4 1/2-5 minutes".

Hmmm.....these Oldies do sound rather interesting, at that...!!!!

INDOOR**NEWS and VIEWS**

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081



****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 REPORTTeam 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 asymmetrical 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 $e = QH/W$ ($QH =$ 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.

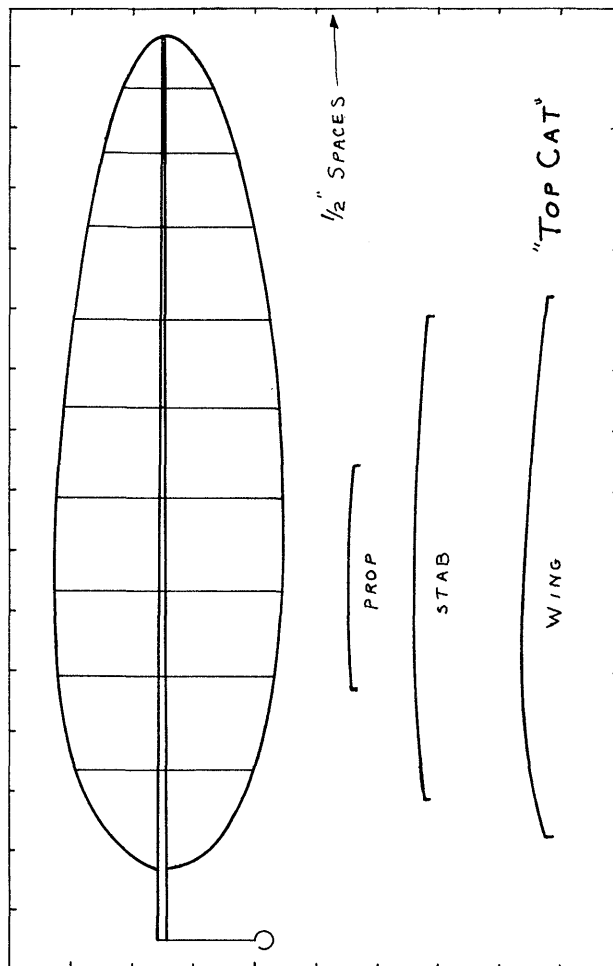
VIRGINIA - HAMPTON

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

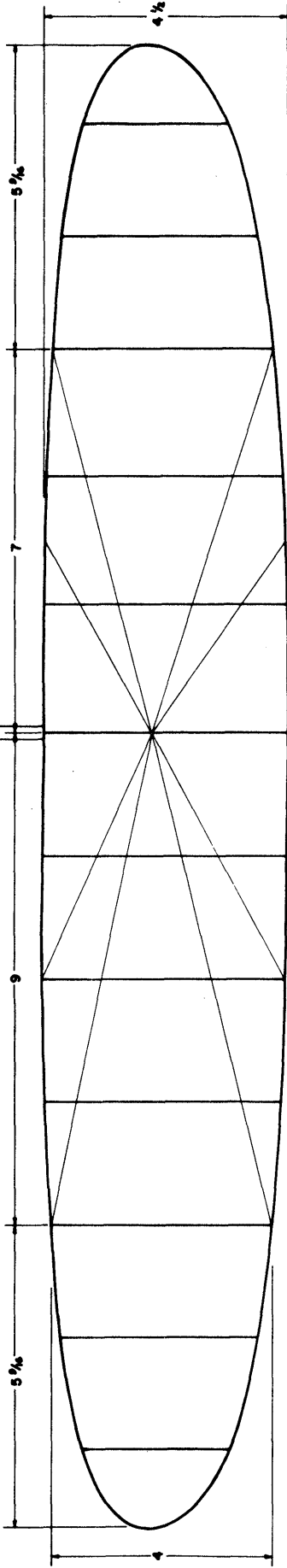
"Top Cat", our model of the month, has been a winning design for Bob Randolph and his daughter Linda. It was developed from a basic design by Bill Bigge, and the 7 paper versions and 2 microfilm versions have racked up an enviable record. It won second place in both Jr. & Open paper stick at the Nats, 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 15 1/2 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.

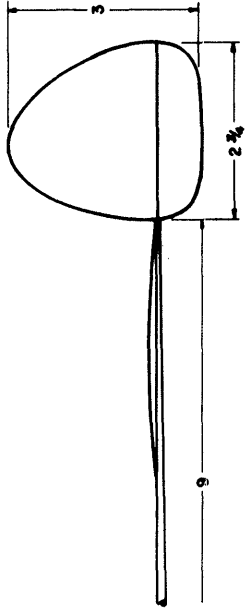
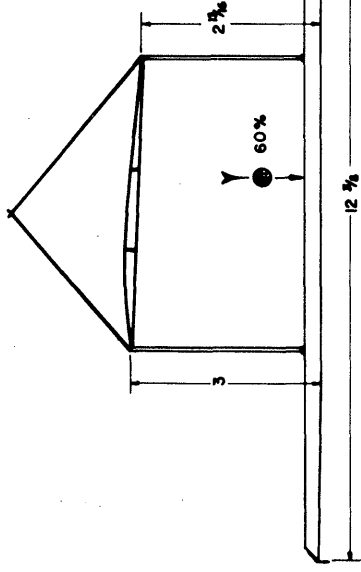


STAB RIBS—.020 X .030
STAB SPARS—.030 X .035

WING RIBS—.020 X .030
WING SPARS—.034 X .045→.042

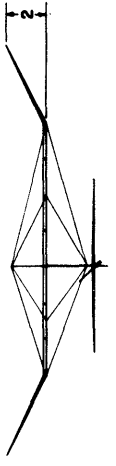
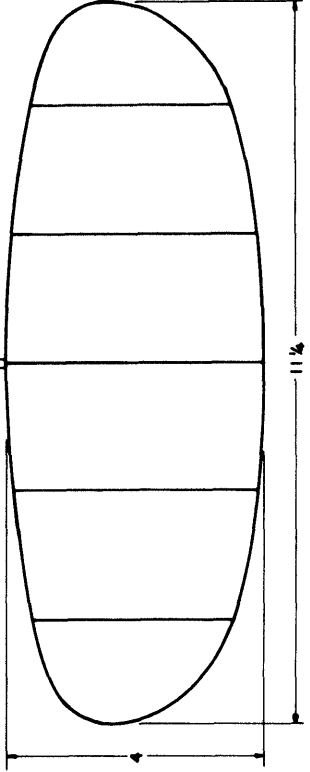


1/2" WASHIN IN LEFT WING



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 (any curve in the spars), this type of bracing must 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 should 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 their 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 stretch-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.

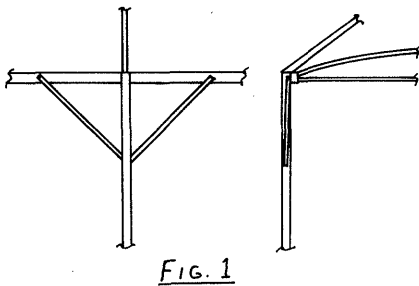


FIG. 1

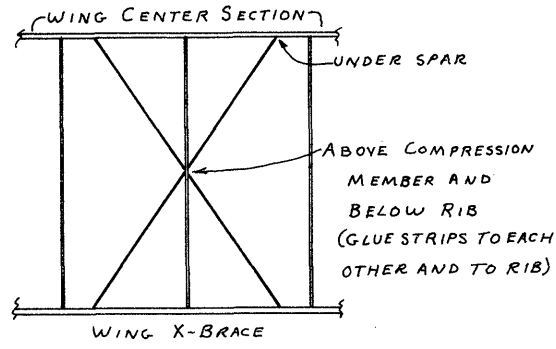


FIG. 2

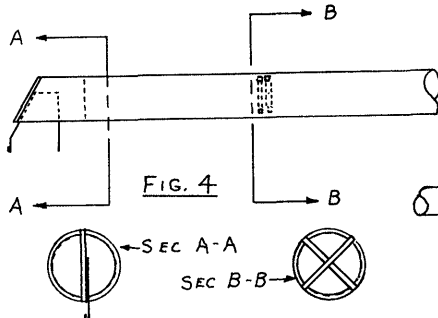


FIG. 4

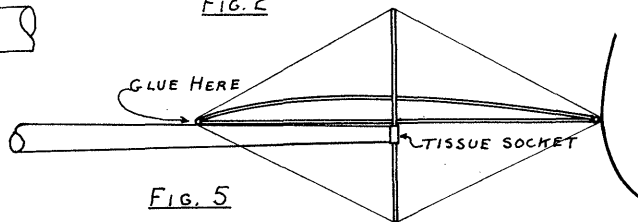


FIG. 5

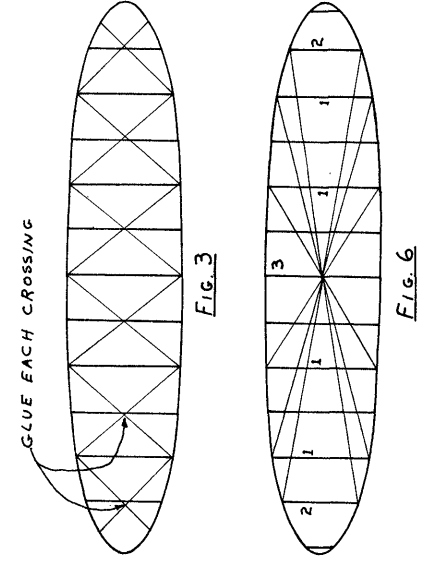


FIG. 6

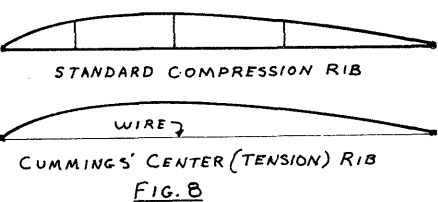


FIG. 8

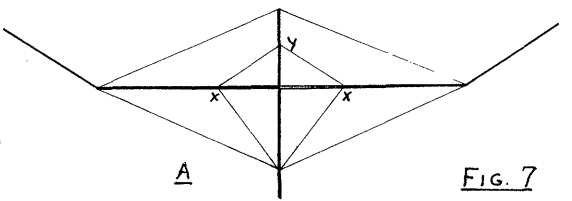


FIG. 7

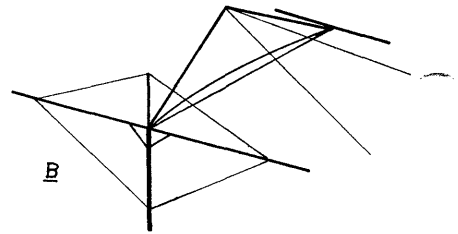
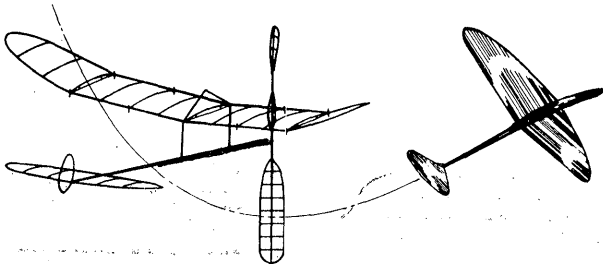


FIG. 7b



INDOOR

NEWS and VIEWS

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

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	Dick Ganslen
3838 South 88th E. Ave.	917 Blackberry
Tulsa, Okla. 74145	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.

THE LAB
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)

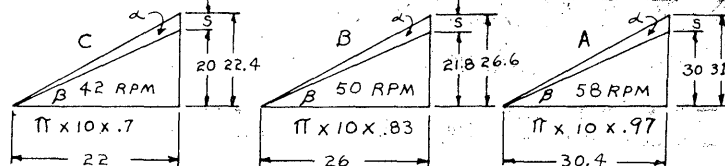
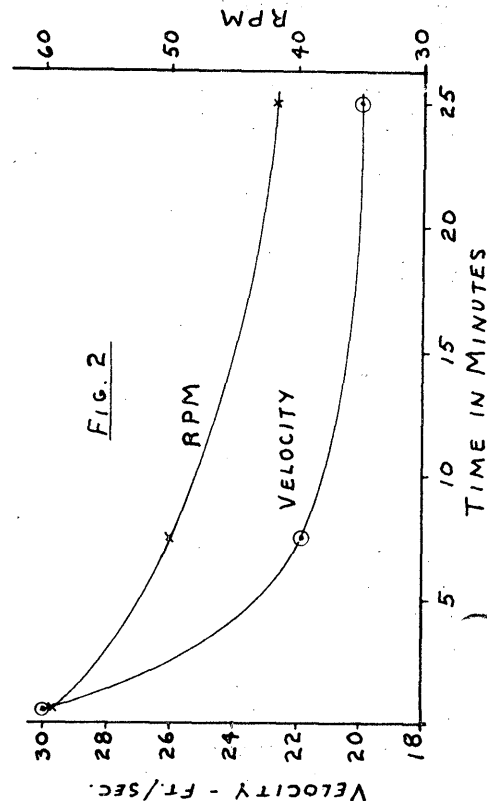
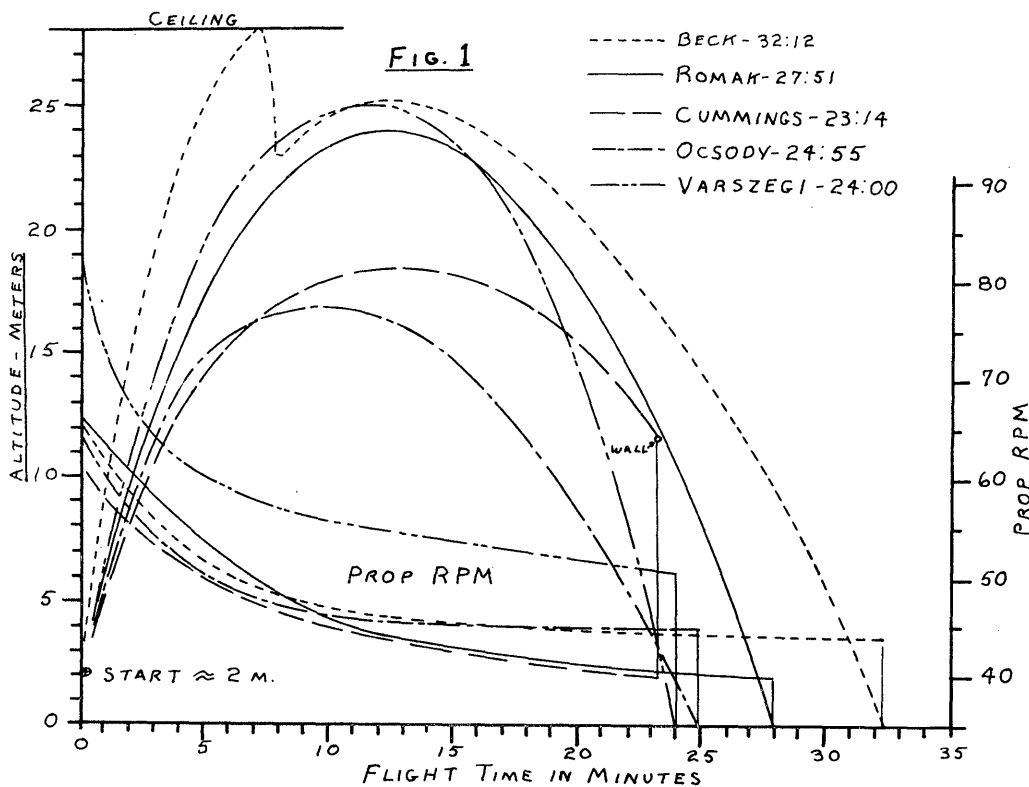


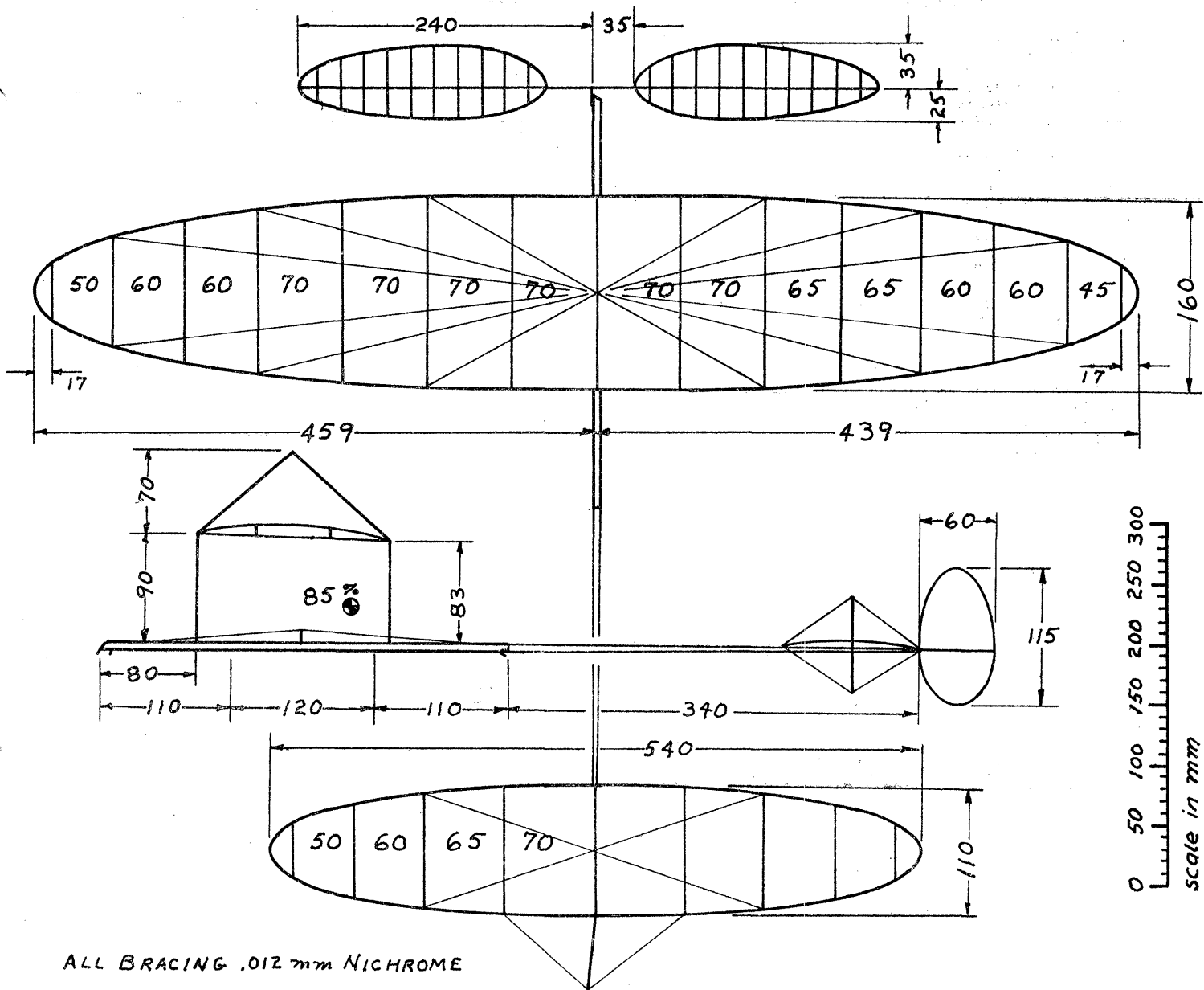
FIG. 3

Referring to Fig. 3C, the base of the triangle represents the circular distance travelled by the blade element at 5" radius ($\pi \times \text{Dia.} \times 10$) 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 (α) 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 equipment 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.



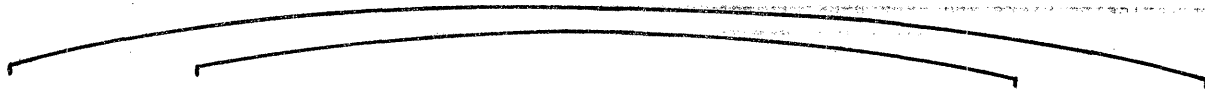


ALL BRACING .012 mm NICHROME

WING 0.36 g.
 STAB 0.48 g.
 + FUS.
 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 28m. 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.

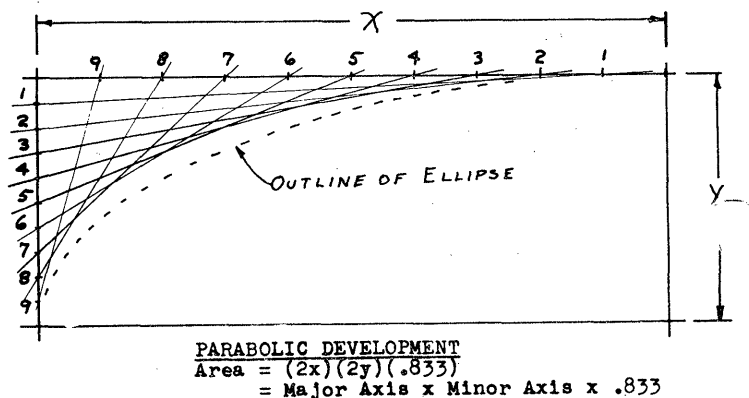
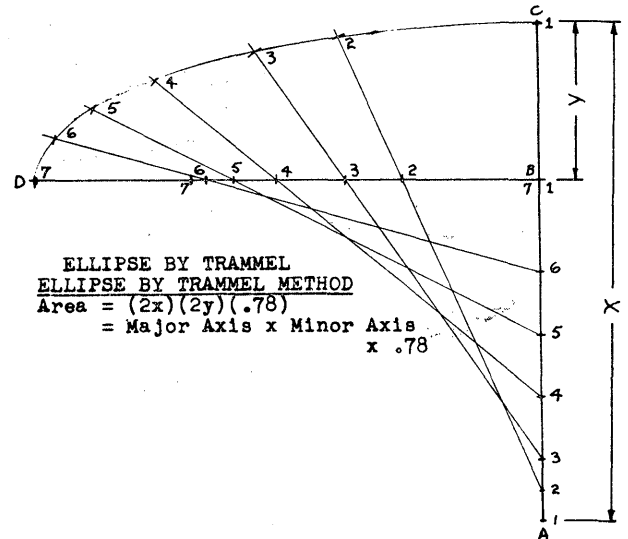
DESIGN FOOTNOTES

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.

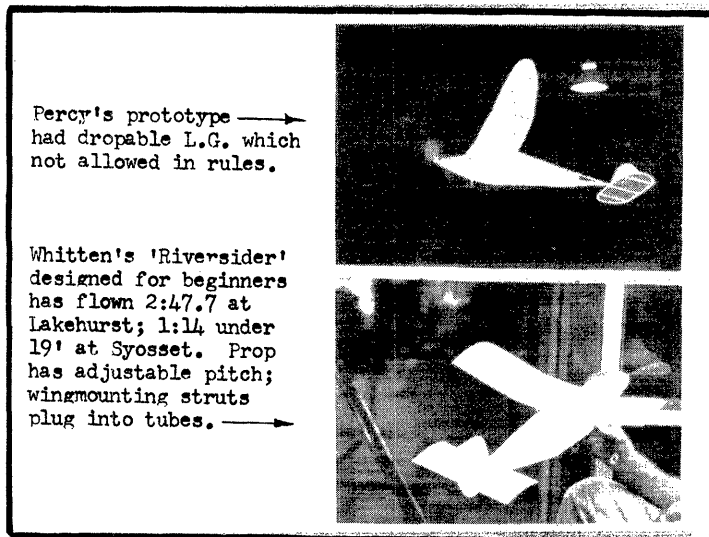
The time-honored ellipse can be constructed with a straight-edge and dividers as shown in Fig. 1. Construct line DB perpendicular to line AC; segment BC is equal to one-half the root chord of the finished wing and segment AC is equal to one-half the span. Using the dividers, mark off the distance AB 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.



Because certain important attention has been focused on the Manhattan Cabin Formula Model, it is rather important that we 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 development 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 3 1/2", 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'd like some leeway. How about a smaller fuselage cross section - say 1 1/2 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'd rather build a flying scale than a model like the old Commercial."

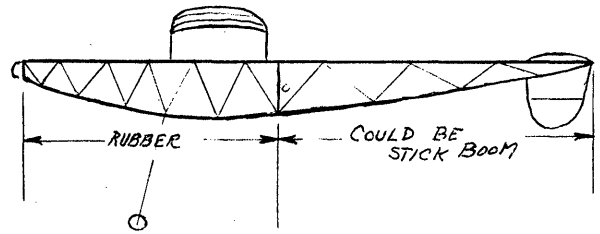
DICK PERCY wrote..."The 2 x 3 x 4 Box could, as you said, be easier and work just as well, but that 2 x 3 x 5 is an interesting challenge in design as to what to do with the extra 1" in relation to max. wing chord."

BUD TENNY wrote... "The Manhattan model, intended as an intermediate between indoor scale and the present indoor cabin classes, is still under experimental development 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 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 SIG 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 3½", 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."

INDOOR**NEWS and VIEWS**

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

****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 REPORTSpecial 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.

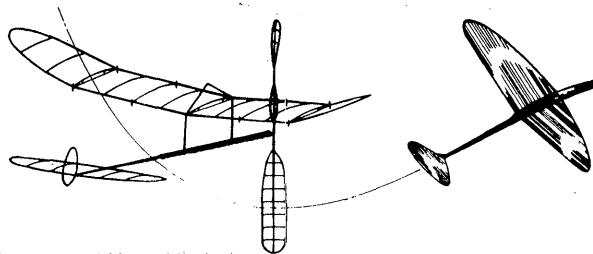
Team Selection Trials Schedule

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

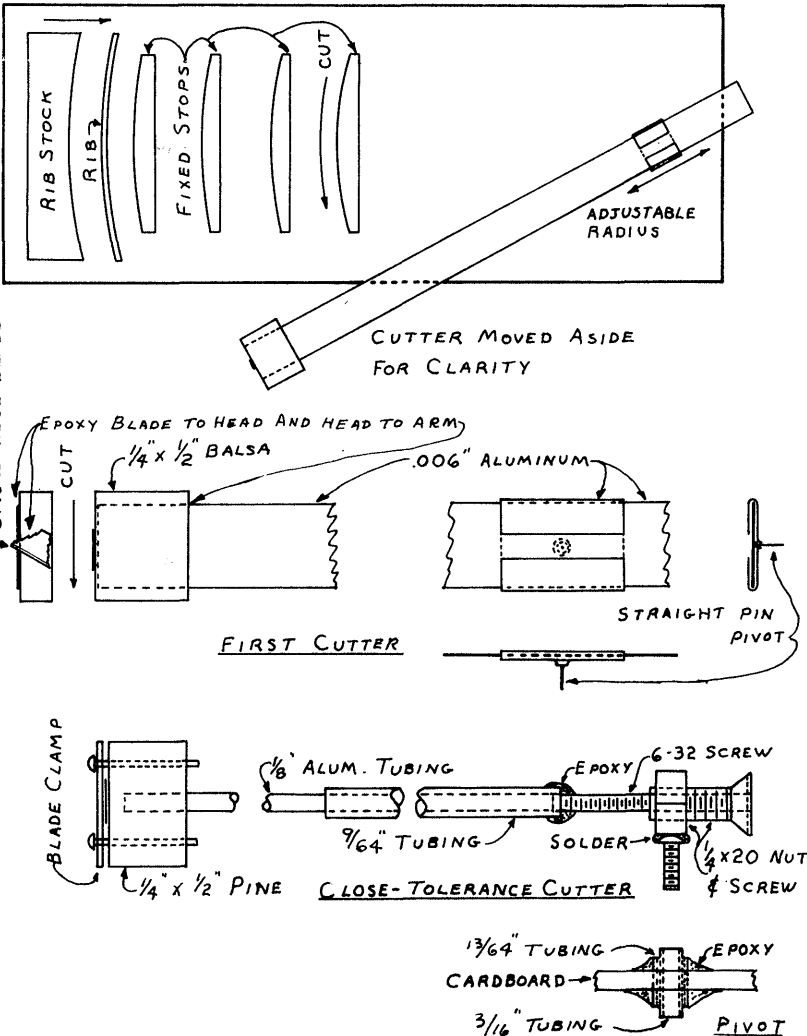
A Rib Stripper

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 difference 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.



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 very light (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 Orbiters 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.

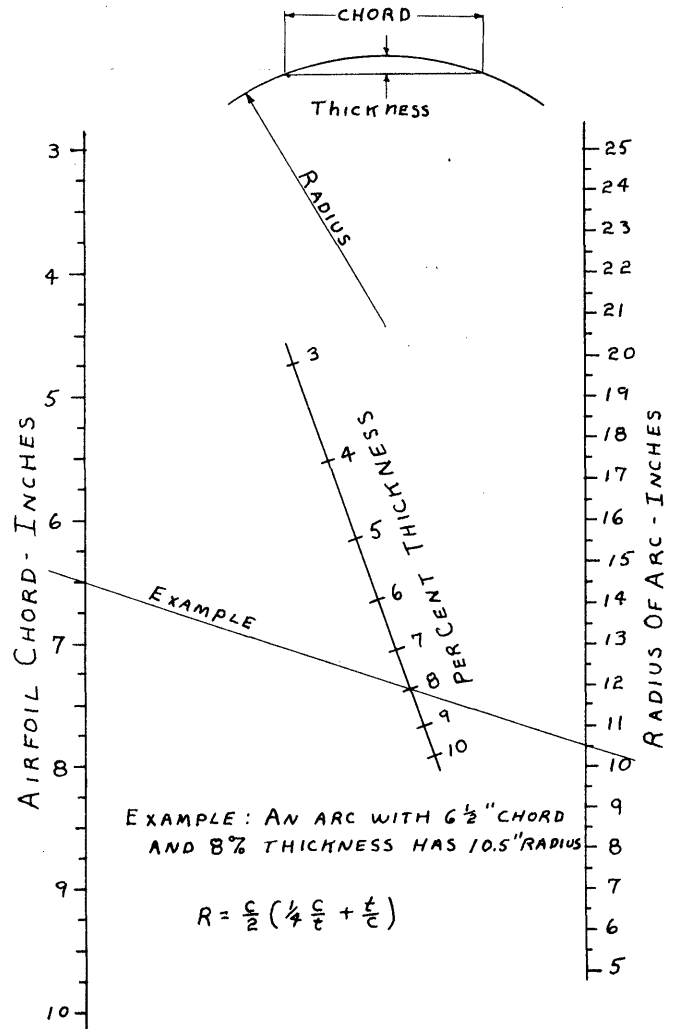
ILLINOIS - CHICAGO

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 not available: March 12, April 9, April 30, May 14, 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.

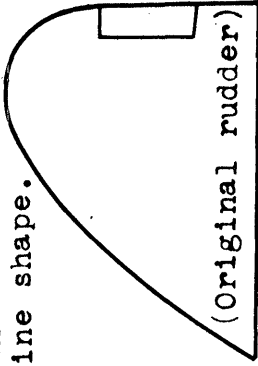
INDIANA - KOKOMO

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.

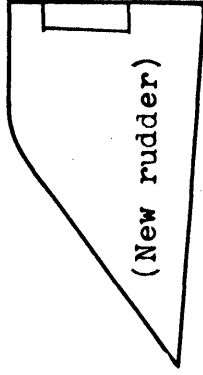
(CONT. ON P.4)



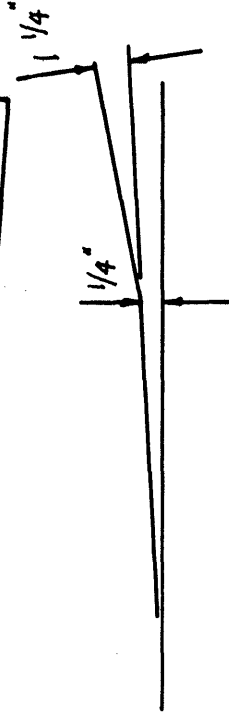
1/32" sheet
Sand to stream-
line shape.



(Original rudder)



(New rudder)

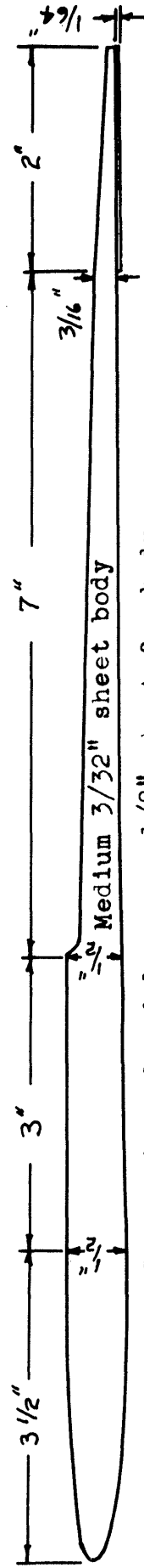


Use very light 1/8" sheet for wing.
Sand in undercamber (3/16" to 1/16")
after wing is glued to body. Add
8# test monofilament to leading edge
of wing. High point is 13/16" from
leading edge.

1/16" sheet for finger grip

USE NO SEALER
Launch model straight up and
slightly to the right. Use
no undercamber at extreme tip.
Set rudder tab for left circle.

Light 1/32" sheet sanded
to airfoil shape.



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

C.G. 1 1/4"

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 $(2 \times .243) + (2 \times .041) = .568$, 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.

Each 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 Ganalen. 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

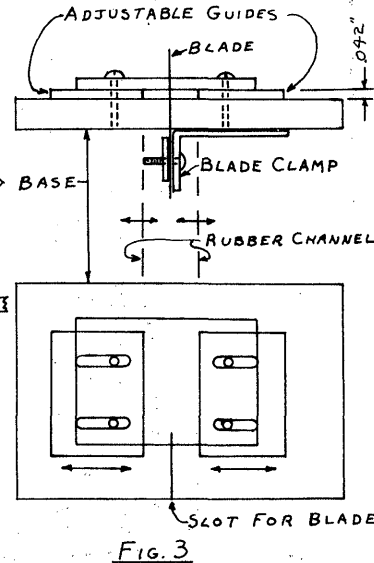
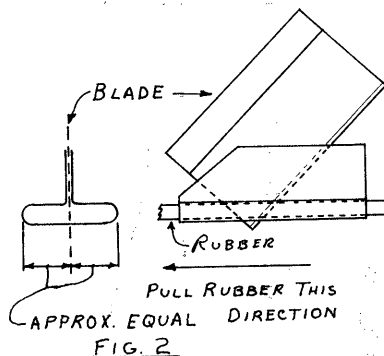
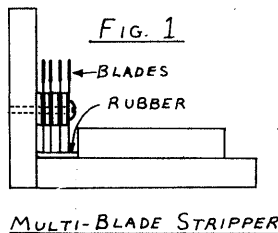
The Cliff Model Club Annual Indoor Contest seems to be the first scheduled activity this year, since no one has been able to locate a site to replace the Arlington Rec. Hall site which served so well in the past. The contest is set for Feb. 26, 9 AM to 5 PM, at the Dallas NAS Drill Hall. The events are: 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.

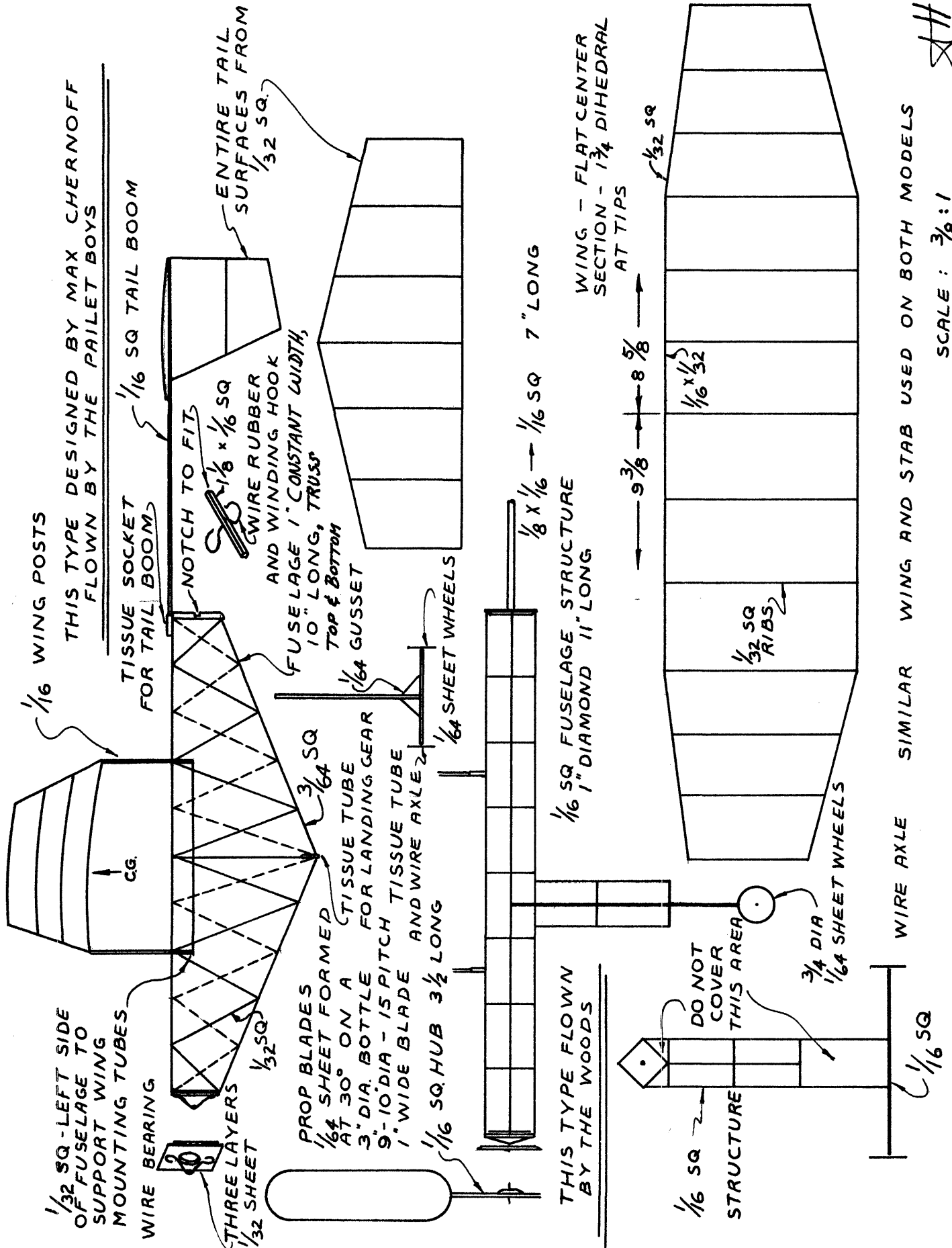
VIRGINIA - HAMPTON

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 Maxcutors 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 Violet, 3737 Marlborough Way, College Park, Md. 20740. The Maxcutors 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.





SH

MANHATTAN COMMENT

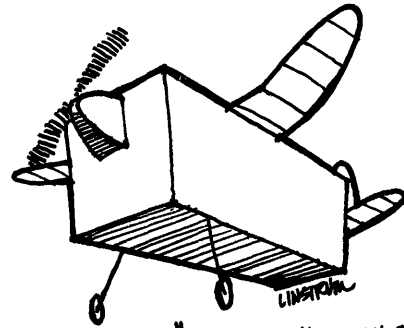
Although the Manhattan's .3 oz. overall weight has been regarded by some as rather heavy, it appears, from correspondence received stemming from last month's review, that some modelers prefer it even heavier.

* * *

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 Riverside 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 LINSTROM 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?"

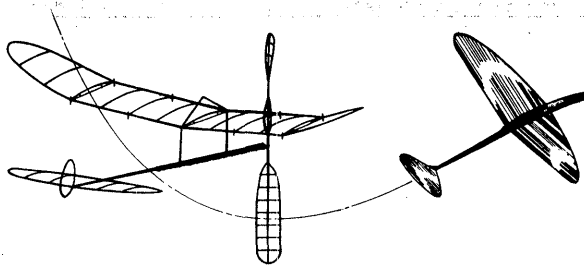
* * *

All of your comments are greatly appreciated, and we look forward to receiving many more. Keep them coming!

INDOOR**NEWS and VIEWS**

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

****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 Burkhardt 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 meantime, the films have been on loan almost continuously 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 REPORTSpan 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 Orbiters
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

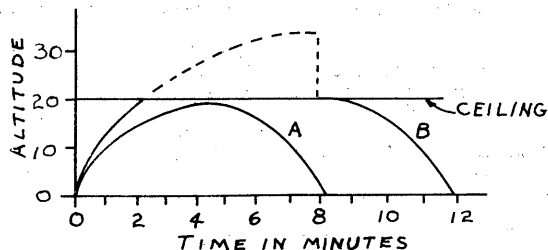
Bob Clemens	RCS	7:08.5	0	7:08.5
Hal Crane	HBB	6:33	1.087	7:07.7

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 off 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 Dobbbers 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 Maxcutors 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.

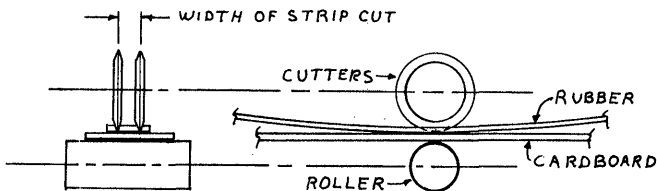


FIG. 5

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.

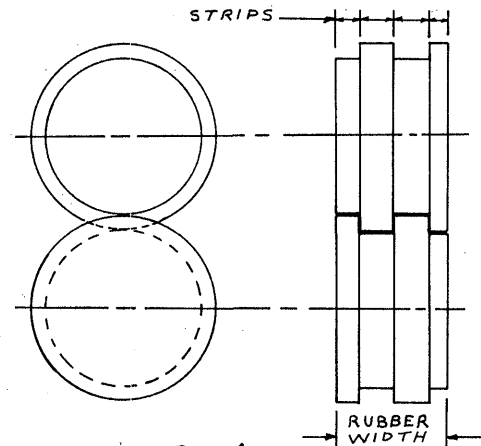
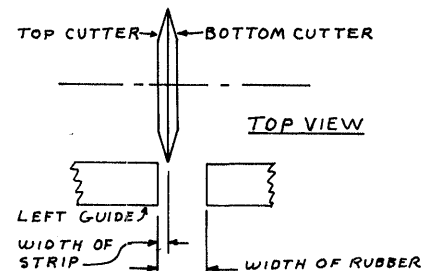
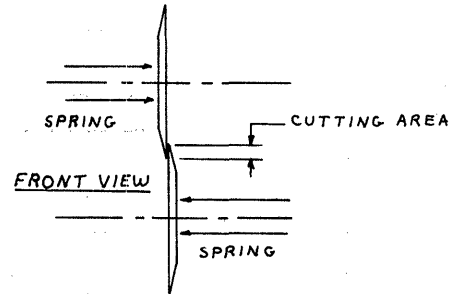


FIG. 4



(BOTH GUIDES ADJUSTABLE)

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.

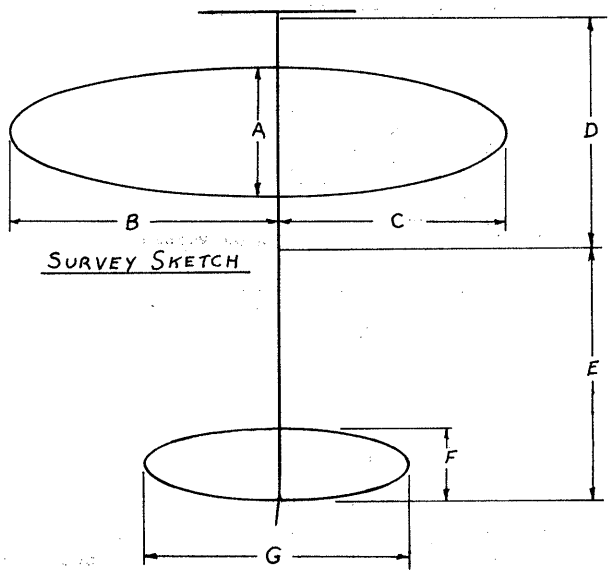
Do you have trouble with knots in your motors coming loose? My own personal preference is this one: Tie an overhand knot in both strands together, moistening the rubber before pulling the knot tight. Pull the overhand knot tight, and then tie a square knot on top of the first knot and clip the loose 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

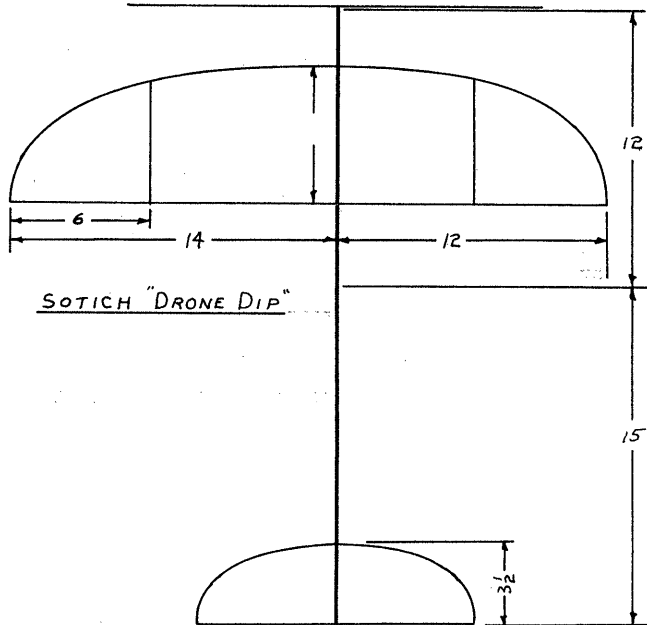
In response to several requests about what types of design trends are coming up in 65 cm. FAI, this month's offering is the results of a survey conducted last month. The information is in the nature of a preliminary report, since many of the models reported on have only been test flown and have not been 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



RECORDS? MAYBE!



TWO CAT. I GLIDERS

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.

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.

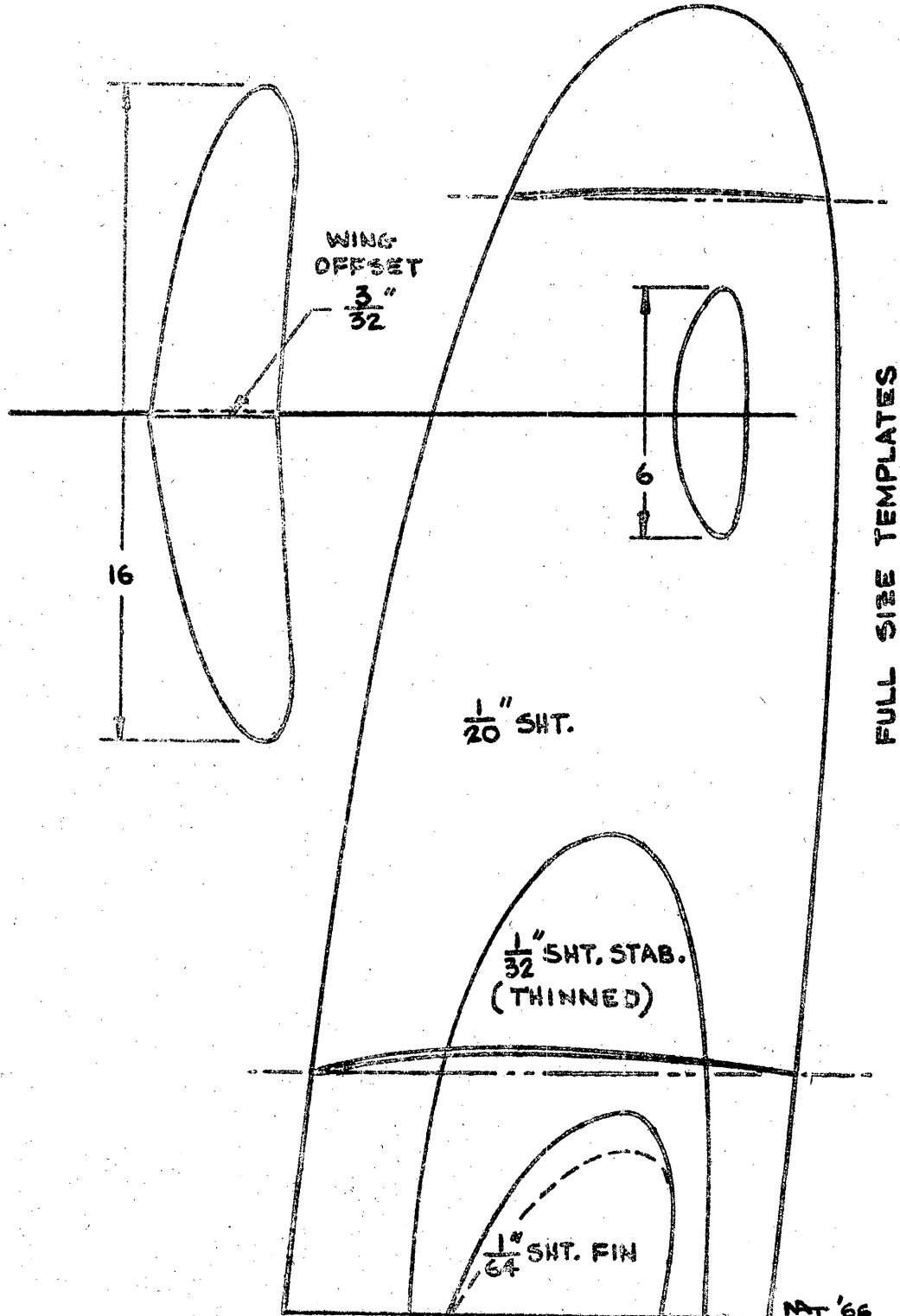
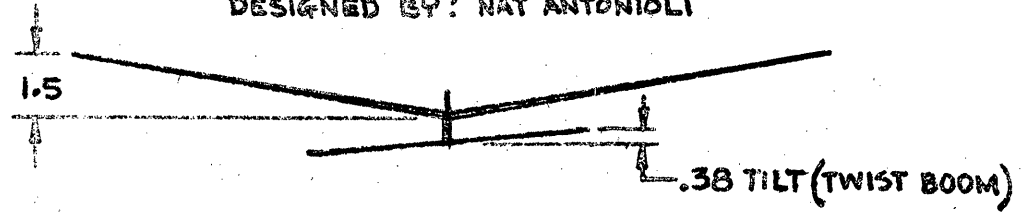
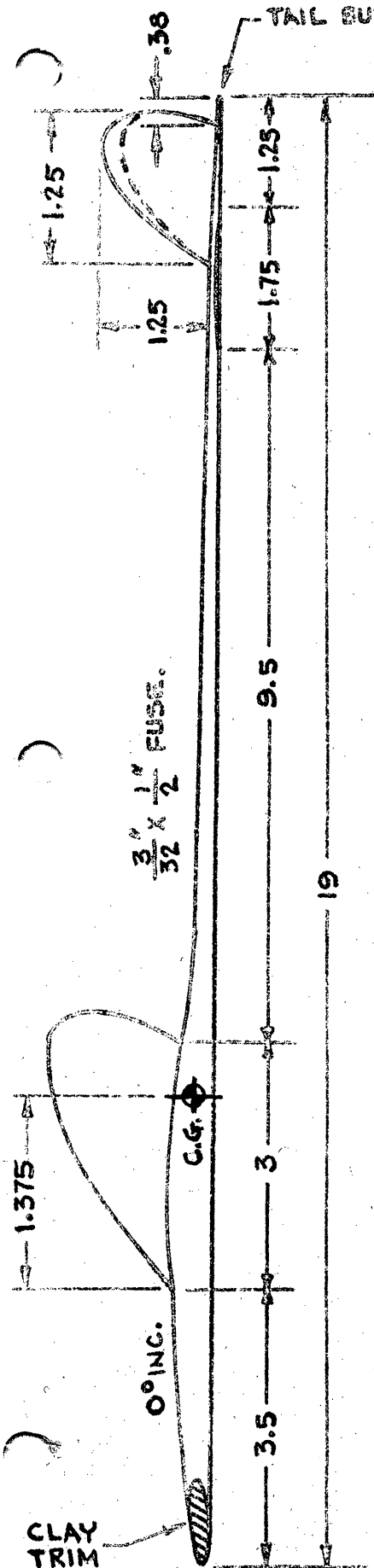
Nat Antonioli says he doesn't recommend the 1/32" sheet wing shown on his original glider, as it doesn't hold up well. His present glider (same design) weighs .17 oz. Nat has been flying in a 22' site, so this will give some idea of proper weight. His times in this site have been about 0:25.0.

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



NAT '66

From among the Rafters

Did you know...that our Research and Theory Society (better known as the RATS) have come up with several exciting items it is felt should be presented to the modeling public?

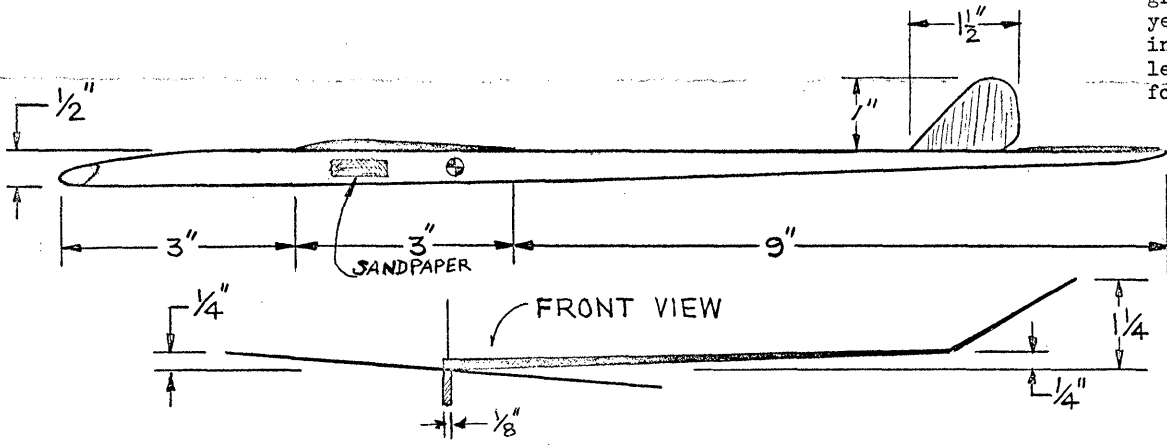
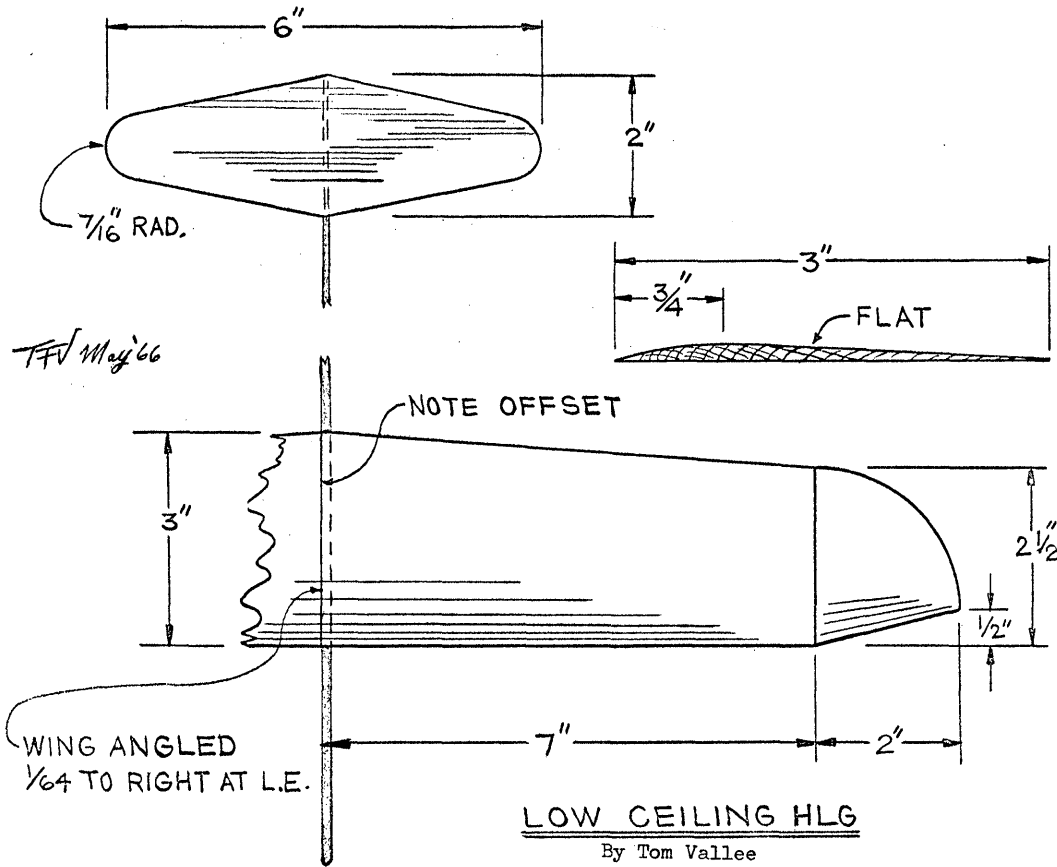
For instance, did you know...that the theory behind the hovercraft and of vertical ducted fan flight is not so new?...that its basic principles were firmly laid down by J. Robertson Porter in his book published in London in 1911?...and that a model design of such an aircraft was developed in the USA 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 development 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 development in the 30 years from 1937 to 1967 has been in the modeler, developing from lean youngsters avidly preparing for their place in aviation to

.....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?

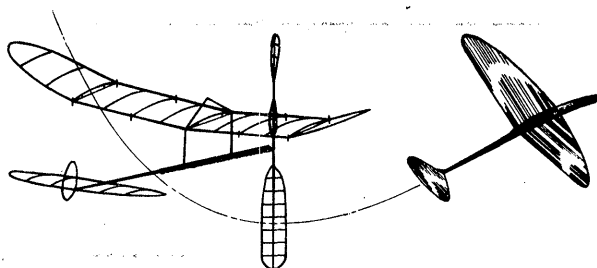


INDOOR

NEWS and VIEWS

\$2/ YEAR NIMAS DUES \$1/ YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081



****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 mana-

ger 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.

<u>Entrant</u>	<u>Ceiling</u>	<u>Time</u>	<u>Fudge</u>	<u>Score</u>	<u>Place</u>
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.

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 Hindee 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".

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 flights 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

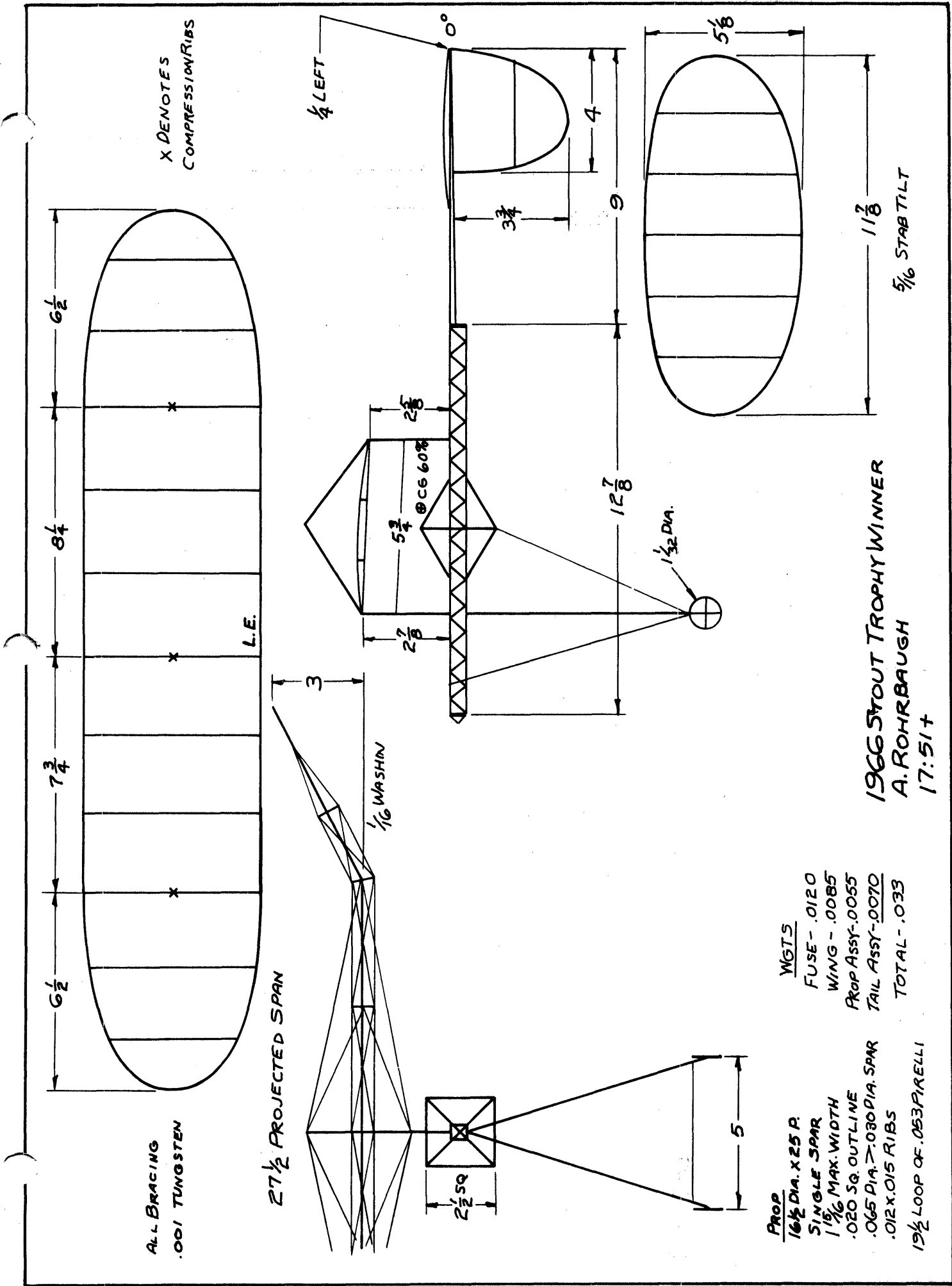
Some people hesitate to tell their story of flying indoor models because they feel they would be "tooting their own horn" too much. So, toot it! People and their hobbies are popular fare for newspapers and company newsletters. This is legitimate publicity for Indoor, and publicity for you is just a bonus. 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

1/16 WASHIN

1/4 LEFT

2 1/2 SQ

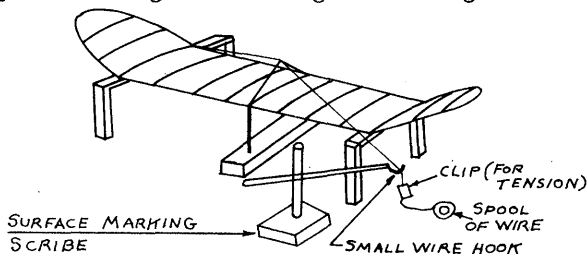
1 1/2 DIA.

- | | |
|----------------------------|-------------------|
| PROP | WGTS |
| 16 1/2 DIA. X 25 P. | FUSE - .0120 |
| SINGLE SPAR | WING - .0085 |
| 1 1/16 MAX. WIDTH | PROP ASSY - .0055 |
| .020 SQ. OUTLINE | TAIL ASSY - .0070 |
| .065 DIA. 7-030 DIA. SPAR | TOTAL - .033 |
| .012 X .015 RIBS | |
| 1 1/2 LOOP OF .053 PIRELLI | |

1966 STOUT TROPHY WINNER
A. ROHRBAUGH
17:51+

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?

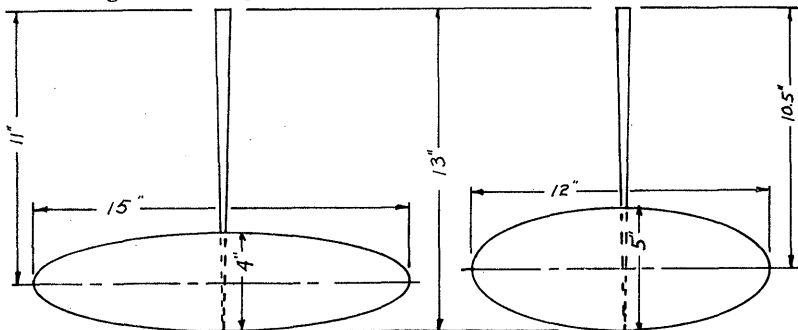
Ted Pfeiffer creates round strips from balsa and bamboo by pushing the square strips through successively smaller holes in a drill gauge. Almost any usable size of round strip can be produced in this manner by using drill gauges from number size drills.

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 Huguélet? What happened to John Stokes, a leading indoor flier of the '30's?

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 Belview 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

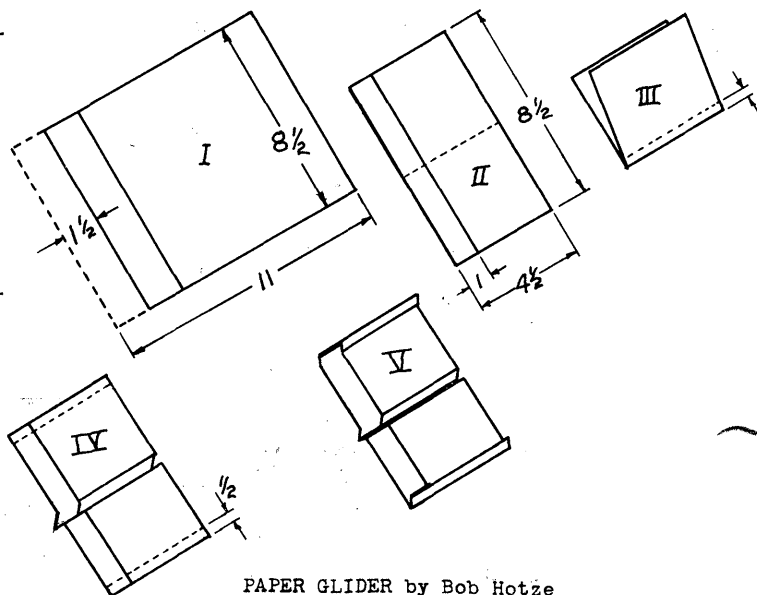
The world's second largest indoor air meet will be the 3rd Annual Indoor Air Meet, scheduled for April 16, 1967 at the Univ. of Pittsburgh Fieldhouse. This meet is patterned after the Great Lakes meet and has five age groups. Six model types plus Originality & Performance will be flown by the five age 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.

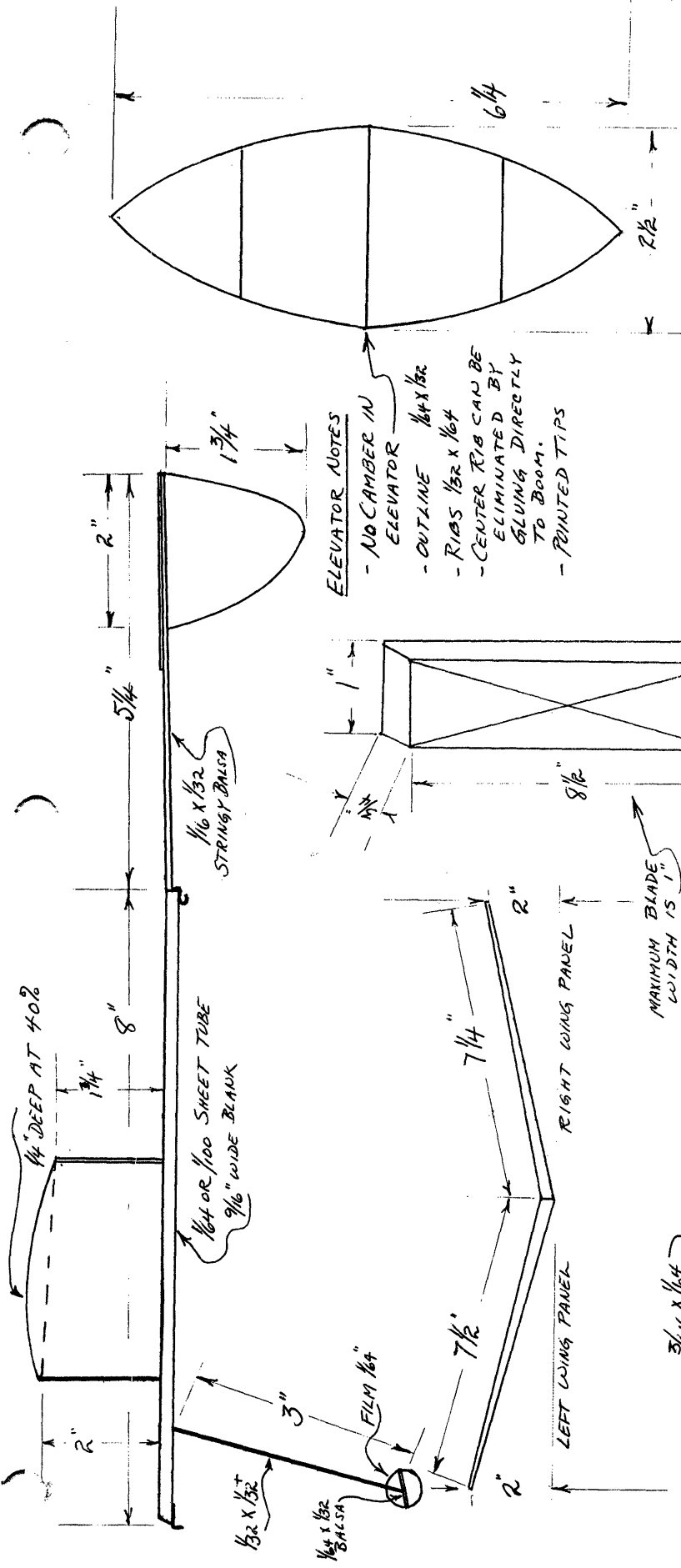
The next two Maxecutor sessions at Kennedy High School are planned for April 21 and May 12. The March 12 contest at Ft. Meade Fieldhouse had the following winners: HLG - 1:06.0, Dan Belleff; Easy B - 7:47, Reggie Batterson; B Stick - 11:08, Tom Vallee; Scale - 66 points (flying and scale) - Bernie Schulman.

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 4 1/2 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

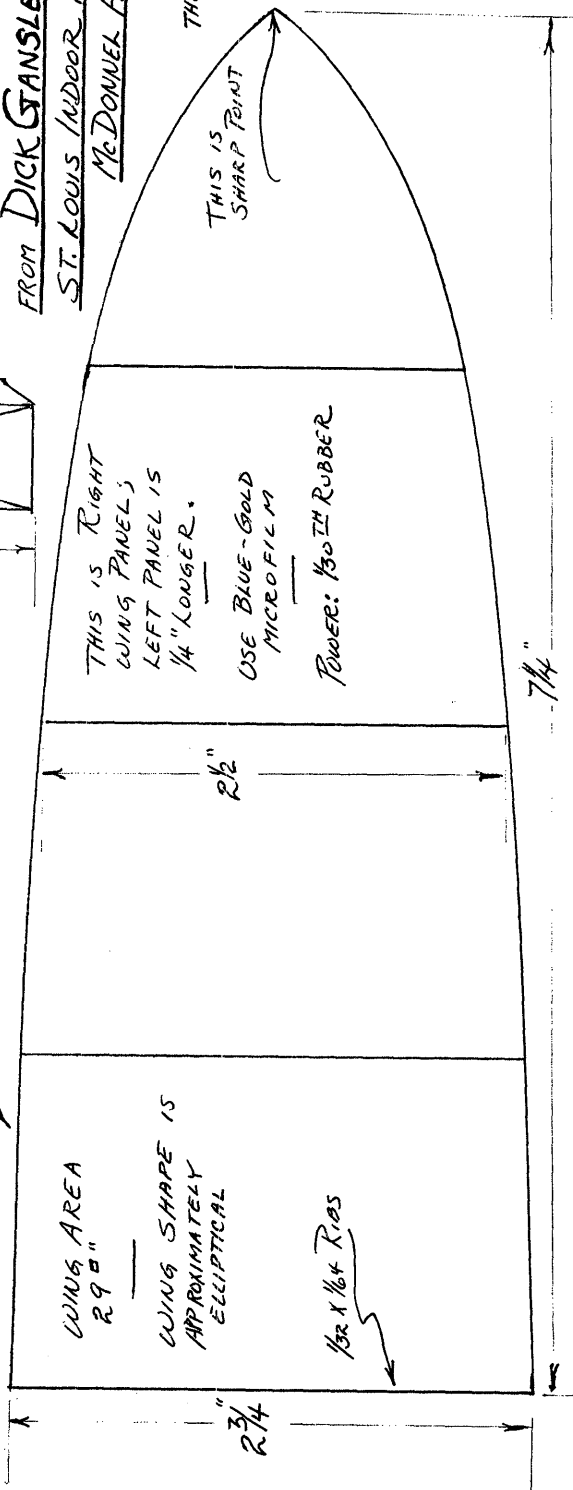


ELEVATOR NOTES

- NO CAMBER IN ELEVATOR
- OUTLINE $1/4 \times 1/32$
- RIBS $1/32 \times 1/64$
- CENTER RIB CAN BE ELIMINATED BY GLUING DIRECTLY TO BOOM.
- POINTED TIPS

FROM DICK STANLEN, NOTED
ST. LOUIS INDOOR FIEND AT
McDONNELL AEROSPACE

THIS CLASS "A" R.O.G. DID
 9:40 IN 1935.

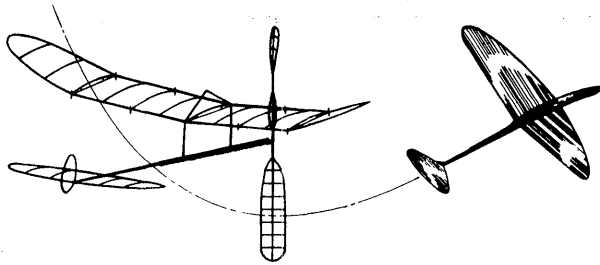


Desg. BY ESSU.

INDOOR**NEWS and VIEWS**

\$2/YEAR NIMAS DUES \$1/YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081



****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 than 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 REPORTFAI 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 ScheduleQuarter 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 Servates	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 Stiek - 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.

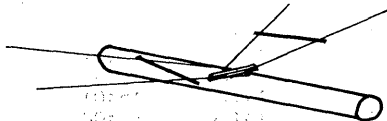
The gull wing and dihedral tail give the model an unusual appearance. The wing is built with high dihedral and pulled down by the braces on the lower surface. This feature leaves the top clear of brace wires and makes for easy patching and re-covering. The short wing struts help reduce drag somewhat.

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 13 1/2" 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. First 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. 75 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

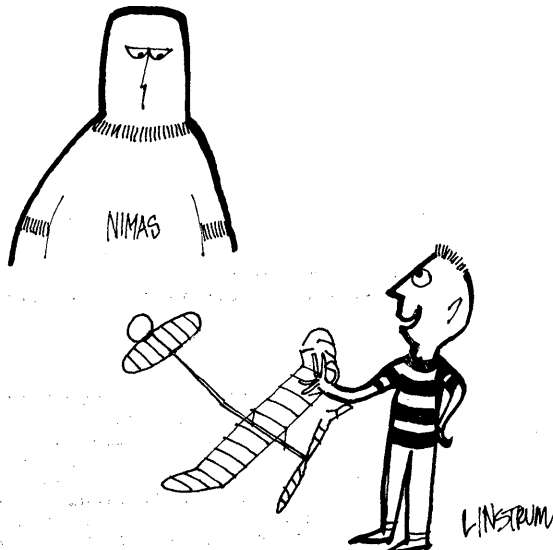
The April indoor contest in St. Louis closed out a highly successful indoor season (competition is over, but practice sessions can be held at the National Guard Armory on Wednesday nights). Winners: Jr. Easy B - 4:42.4, Pat Wood; Open Easy B - 8:09.0, Bob Hotze; Open Paper Stick - 12:48, Charlie Sotich; Jr. Paper Stick - 4:33, Pat Wood; Jr. HLG - 1:06.5, Dave Veselsky; Open HLG - 1:28.9, Larry Gailliau.

OKLAHOMA - TULSA

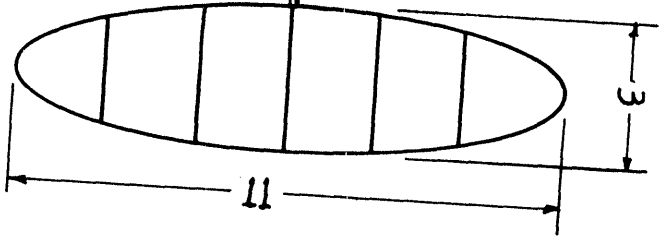
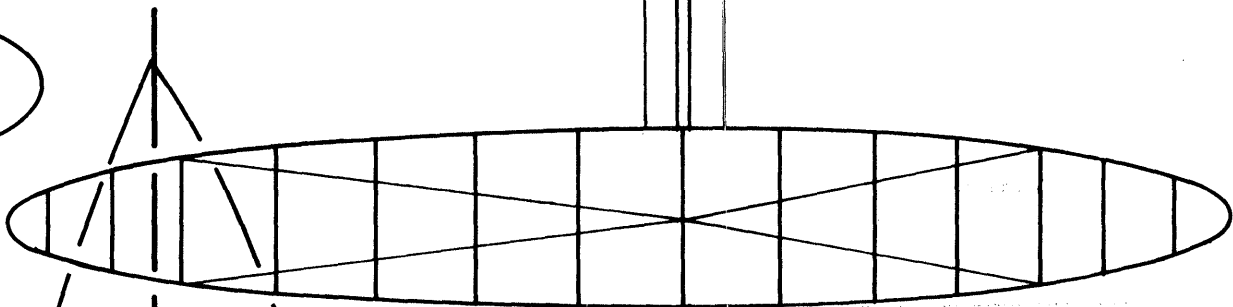
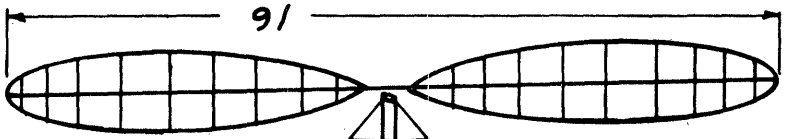
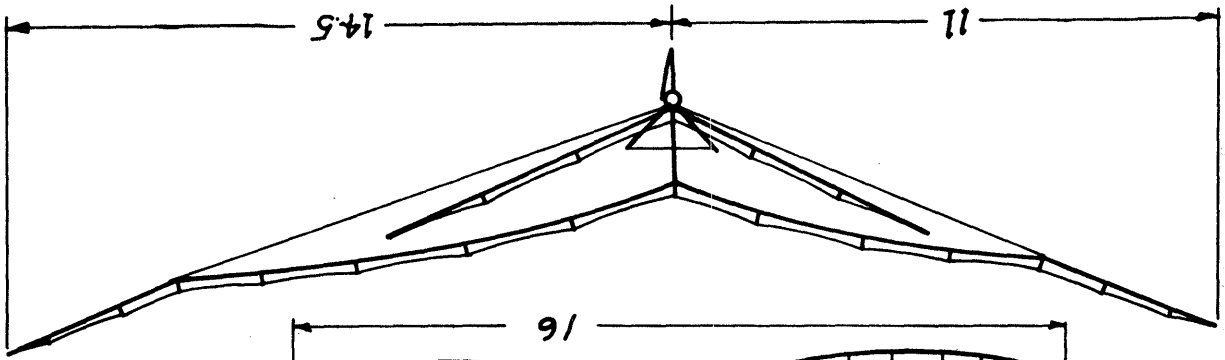
The Tulsa Glue Dobbbers have thrived on indoor - so well that Bob Hanford plans a sanctioned contest in June. This is a triumph for Bob and others who have worked so hard to establish indoor there, and it is heartening to others in the south central U. S. also. If a few more groups can follow through 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

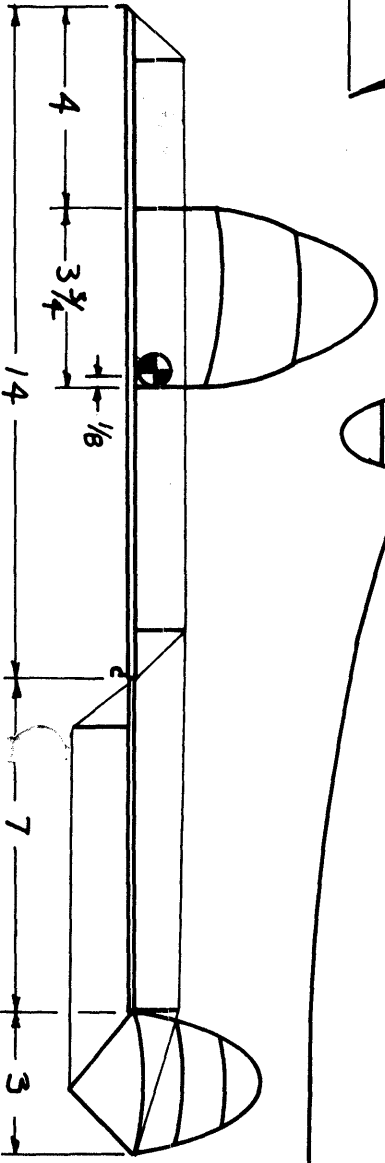
Scale models and FAI models were flown at the April 30 session at Lakehurst - at a brand new scene. Hangar #2 (far north of the big hangars) is a 100' site, very drift-free and well lighted. As a site for team selection, it could hardly be beat - it was an excellent choice. Even with the light, however, 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!"



MODEL WEIGHT - .035 oz.
 1/16" LOOP .08" PIRELLI - .053 oz.



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.

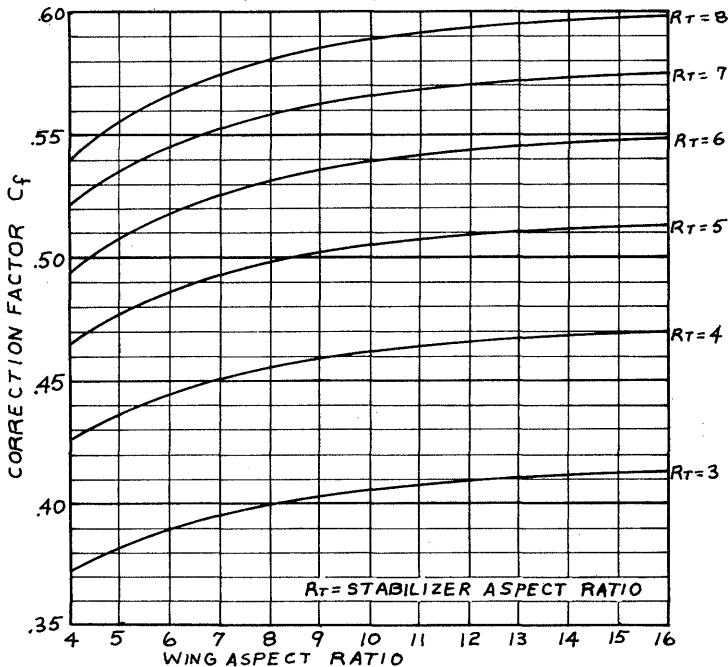
The aspect ratio of a lifting surface changes the rate of change of lift with change in angle of attack. For any model which makes a given change in angle of attack, a stab with high aspect ratio will increase in lift faster than a stab with low aspect ratio. The graph and example below illustrates the 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:

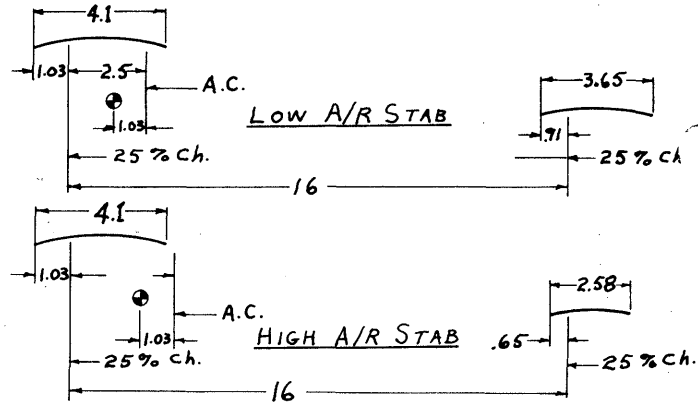
$$A.C. = \frac{\text{stab area}}{\text{wing area}} \times \text{tail moment} \times .39 = .4 \times 16 \times .39 = 2.5$$

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 $\text{Span}^2/\text{Area}$
- STEP III Find C_f from graph
- STEP IV Find distance from 25% point of wing to A. C.
 $A.C. = \frac{\text{stab area}}{\text{wing area}} \times \text{Tail Mom. Arm} \times C_f$
- 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 international toy exhibition. (Ed. note: Hans is a toy designer at a big plastic firm in Nurnberg.) This is now over and I have time to devote to indoor modeling. To my surprise I was selected to represent Germany, together with Strattnner 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 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 with 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 Pittsburgh'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	HIG	Pre-Fab	Paper Egg B	Mike	Flying Scale	Orig Perf
Juniors Age 15 & Less	54 Dodoes (9 & Less)	40	14	11			2	4
	63 Fledglings (10-12)	39	23	10	4		6	9
	39 Juniors (13-15)		15	12	5	3	6	1
	8 Seniors (16-20)		2	1	0	1	0	3
	25 Open (21 up)		13	8	7	4	9	
Total 189		79	67	42	16	8	23	17

KDKA F-1020

Dodoes	Age	Time
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

Dodoes	Age	Time
(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 followed.

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. Thicker 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

Dodoes	Age	Time
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"

Fledglings	Age	Time
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

Juniors	Age	Time
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 Skrzjane	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

Juniors	Age	Time
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

Dodoes/Fledglings/Juniors	Age	Time
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
Fairchild		
2) Betty Jane Kastory		Helicopter PC6C
Valerie		
3) Ken Johnson	36	1910 Pusher
Robin		
4) Ron Ganser	40	Curtis

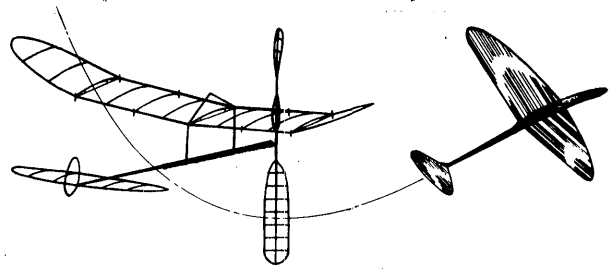
ORIGINALITY & PERFORMANCE

Dodoes/Fledglings/Juniors	Age
1) Robert Postage	11
2) Paul Hare	9
Seniors	
1) James Dorsey	17
2) Allen Stein	18

INDOOR**NEWS and VIEWS**

\$2/ YEAR NIMAS DUES \$1/ YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081



****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 REPORTFAI 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:

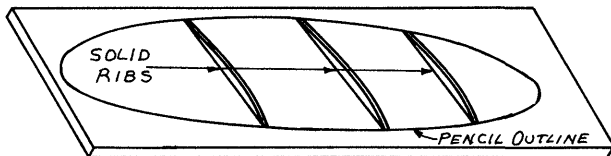
I believe the gear design puts the cross section where it can do some good in producing a sturdy structure with minimum weight. The plane flies very well, but has not had a chance to prove itself yet. The Nats was the only time I've let it fly out of my reach, and then it was badly underpowered and only 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

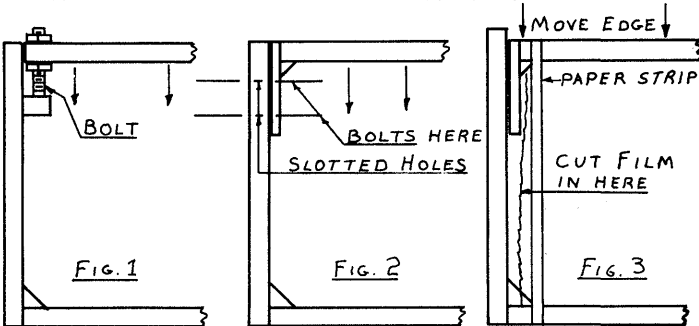
Covering Tip

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

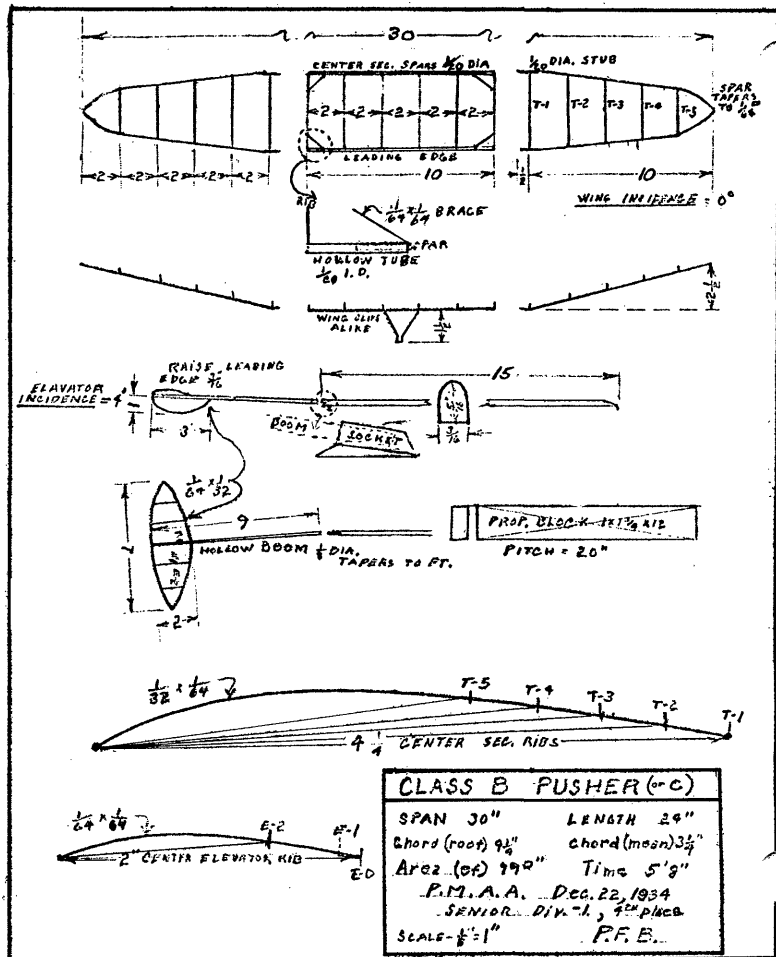
The March '66 INAV showed two methods of slackening film for covering - and here's another method. Vilim Kmoch (Yugoslavia) suggests that one side of the hoop can be mounted on a bolt as shown in Fig. 1 below. Move the side out to the dotted position and lock it while picking up the film. Move it in 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. Cjyarmati	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:

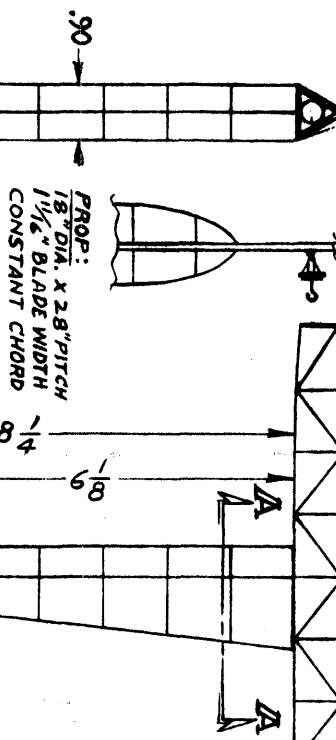
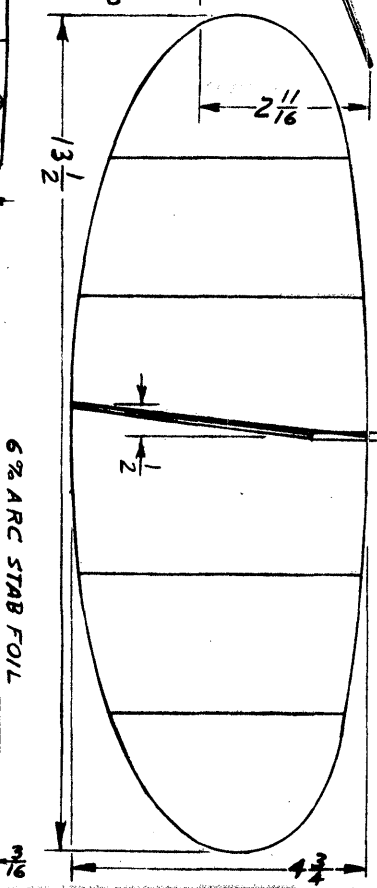
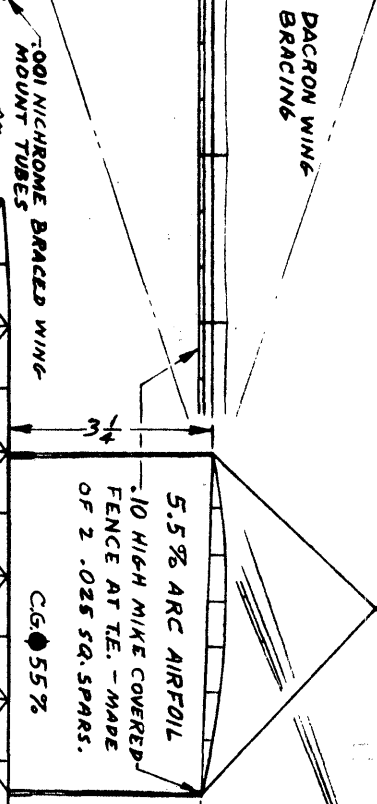
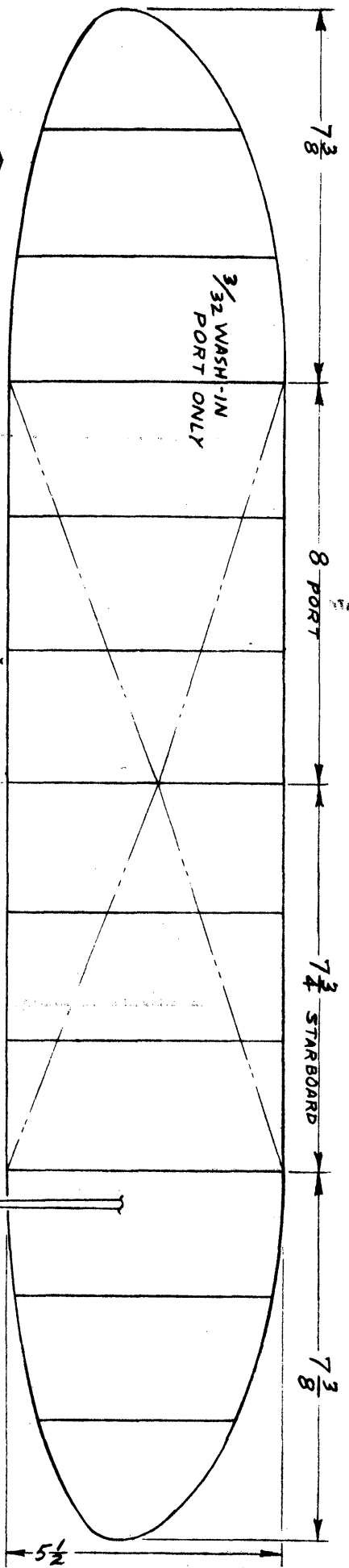
1. Jiri Kalina	Czech.	27:10 + 26:30 = 53:40
2. Zoltan Ocsody	Hungary	26:55 + 24:01 = 50:56
3. Karoly Biro	Hungary	25:30 + 21:00 = 46:30

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

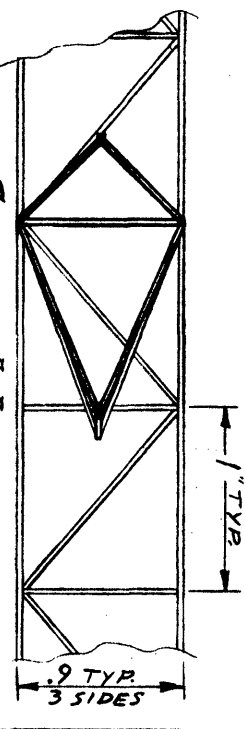
48 contestants entered the annual Michigan Indoor State Meet, flying in eight events. Conditions were turbulent early in the day, but settled down before the end. The winners: Jr. HLG - 1:02.4, Art Marklewicz; Open HLG - 1:25.9, Len Stress; Jr./Sr. Paper Stick - 11:30, Linda Randolph; Open Paper Stick - 17:24, Bob Randolph; Jr./Sr. Indoor Stick - 14:32, Art Marklewicz; Open Indoor Stick - 21:58.5, Bob Randolph; Jr./Sr. Flying Scale - 120.5 points, Steve Macisaac; Open Flying Scale, 136 points, Bruno Marklewicz.



WEIGHTS:

WING	.0095
FUSELAGE	.0106
GEAR	.0007
TAIL ASSY.	.0064
PROP	.0078
TOTAL	.0350 OZ.

"FENCE POST"



1/16 DIA. TUBULAR BOOM
EXTENSION -.005 WALL.

CLASS 'C' INDOOR CABIN BY *Jim Richmond*

8. 9/16 12. 1/2 15. 5/8 6. 1/2

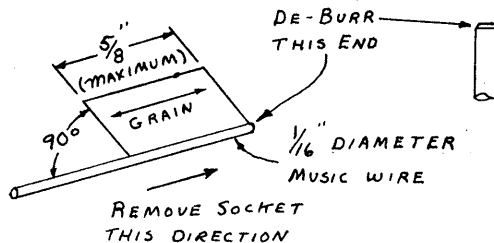
YUGOSLAVIAN RUBBER STRIPPER

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.

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.

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.

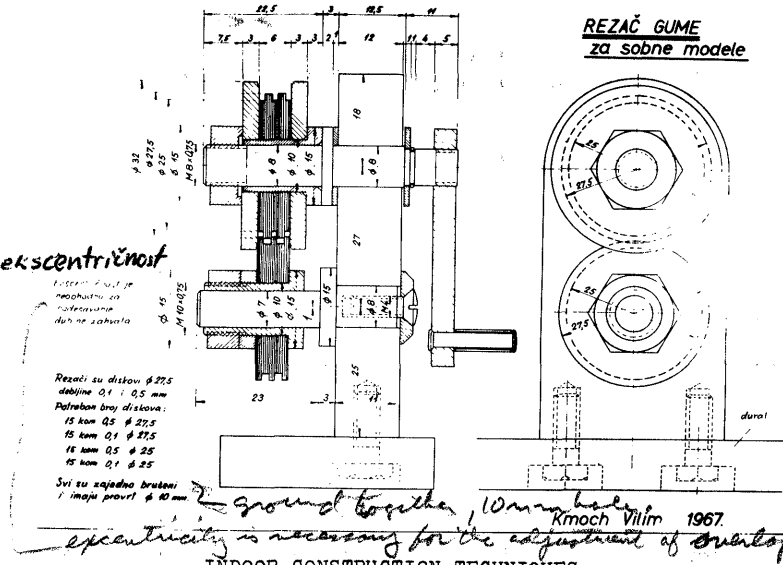
So I sent today to your address two children's coffins. In the big one are all kind of jigs and other materials. In the smaller one are my old models which I used at Cardington. The wings and stabs are absolutely useless because of gigantic warps which wandered in the models in the last three years. 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



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;

OFFICIAL AMA INDOOR RECORDS
as of May 29, 1967

<u>Category I</u>	
<u>CLASS A R.O.G.</u>	
J - B. DeShields	6:55.1
S - L. Loucka	8:30.0
O - H. Entrop	12:10.0
<u>PAPER STICK</u>	
J - L. Randolph	8:28.0
S - W. Skinner	8:50.0
O - R. Randolph	11:36.0
<u>CLASS B STICK</u>	
J - B. DeShields	8:57.6
S - L. Renger	10:38.6
O - H. Phillips	16:59.0
<u>CLASS C STICK</u>	
J - B. DeShields	7:02.0
S - J. Gaffrey	9:48.4
O - J. Kagawa	14:09.0
<u>CLASS D STICK</u>	
J - L. Randolph	7:28.0
S - T. Neumann	14:36.1
O - R. Randolph	16:05.5
<u>CLASS B CABIN</u>	
J - J. Skarzynski	5:08.4
S - N. Shipley	9:19.6
O - D. Stamm	7:12.1
<u>CLASS B CABIN ROW</u>	
J - --	-
S - D. Erbach	3:31.2
O - R. Ganser	4:51.0
<u>CLASS C CABIN</u>	
J - R. Ganser	3:48.0
S - L. Loucka	9:12.0
O - R. Ganser	9:15.0
<u>AUTOGIRO</u>	
J - H. Schubert, Jr.	2:25.5
S - E. Smith	2:40.5
O - R. Ganser	4:19.0
<u>HELICOPTER</u>	
J - D. Erbach	3:52.4
S - N. Jones	6:31.0
O - W. Erbach	6:32.2
<u>ORNITHOPTER</u>	
J - D. Erbach	0:30.1
S - E. Smith	2:41.4
O - R. Ganser	3:07.0
<u>H. L. GLIDER</u>	
J - B. Schubert	1:01.0
S - B. Schubert	1:13.8
O - R. Wittman	1:11.5
<u>F. A. I.</u>	
J - --	-
S - -- *	-
O - H. Phillips	16:59.0

<u>Category II</u>	
<u>CLASS A R.O.G.</u>	
J - D. Chancey	8:10.9
S - L. Loucka	10:19.5
O - T. Finch	12:28.8
<u>PAPER STICK</u>	
J - J. Thornbery, Jr.	14:58.1
S - L. Loucka	16:03.2
O - P. Klintworth	19:41.0
<u>CLASS B STICK</u>	
J - L. Randolph	14:35.4
S - D. Erbach	17:16.8
O - P. Klintworth	20:58.0
<u>CLASS C STICK</u>	
J - T. York	19:46.0
S - L. Loucka	19:18.5
O - R. Plotzke	23:29.4
<u>CLASS D STICK</u>	
J - R. Roharik	20:37.0
S - J. Skinner	22:59.2
O - D. Kowalski	29:47.4
<u>CLASS B CABIN</u>	
J - J. Skarzynski	7:15.0
S - D. Erbach	11:31.8
O - W. Erbach	13:52.2
<u>CLASS B CABIN ROW</u>	
J - D. O'Malley	4:30.6
S - D. Erbach	7:44.7
O - W. Williams	9:15.8
<u>CLASS C CABIN</u>	
J - D. Erbach	7:35.8
S - L. Loucka	18:06.4
O - C. Sotich	17:54.8
<u>AUTOGIRO</u>	
J - H. Schubert, Jr.	2:10.0
S - D. Erbach	5:02.2
O - W. Erbach	6:32.8
<u>HELICOPTER</u>	
J - D. Erbach	3:47.2
S - N. Jones	6:30.3
O - W. Erbach	5:50.8
<u>ORNITHOPTER</u>	
J - D. Erbach	1:29.7
S - D. Erbach	1:15.0
O - R. Ganser	2:21.1
<u>H. L. GLIDER</u>	
J - B. Schubert	2:12.1
S - B. Schubert	2:14.1
O - R. Larsh	2:04.8
<u>F.A.I.</u>	
J - L. Randolph	11:40.0
S - --	-
O - J. Richmond	29:21.5

<u>Category III</u>	
<u>CLASS A ROG</u>	
J - A. Saltzman	10:09.0
S - R. Harlan	15:01.4
O - J. Foster	21:52.0
<u>PAPER STICK</u>	
J - L. Randolph	19:03.0
S - R. Harlan	19:48.6
O - F. Cummings, Jr.	24:52.2
<u>CLASS B STICK</u>	
J - R. Cummings	24:03.0
S - D. Kennedy	25:37.6
O - T. Finch	34:15.6
<u>CLASS C STICK</u>	
J - B. DeShields	27:17.0
S - R. Harlan	26:38.4
O - T. Finch	39:55.0
<u>CLASS D STICK</u>	
J - D. Champine	25:45.4
S - D. Morris	30:26.0
O - E. Kopecky	43:42.0
<u>CLASS B CABIN</u>	
J - H. Kaczynski	12:42.4
S - R. Harlan	18:24.4
O - F. Cummings, Jr.	25:44.0
<u>CLASS B CABIN ROW</u>	
J - S. Stackhouse	3:06.4
S - D. Call	13:13.0
O - A. D'Alessandro	17:20.0
<u>CLASS C CABIN</u>	
J - R. Richmond	18:33.3
S - R. Harlan	19:21.8
O - J. Bilgri	29:06.3
<u>AUTOGIRO</u>	
J - E. Vargo	3:53.8
S - D. Erbach	5:27.4
O - J. Triolo	8:08.0
<u>HELICOPTER</u>	
J - C. Lee	4:38.2
S - E. Smith	6:45.6
O - H. Cover	8:11.0
<u>ORNITHOPTER</u>	
J - E. Vargo	1:18.0
S - J. Bock	3:22.0
O - C. Goldberg	4:05.4
<u>H. L. GLIDER</u>	
J - R. Richmond	2:08.8
S - J. Manczuk	2:01.3
O - C. Stevens	2:50.4
<u>F. A. I.</u>	
J - --	-
S - --	-
O - --	-

* indicates possible record
N. Shipley 15:46.0

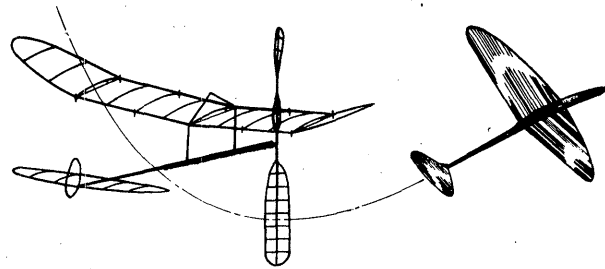
U.S.A. F.A.I. Records (FAI Ceiling Categories)		
I	Hal Crane	13:59.0
II	Bob Wilder	10:05.0
III	Jim Richmond	29:21.5
IV	- -	-

INDOOR

NEWS and VIEWS

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081



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 Serviatas	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	3:26	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. Statistic-

ally, 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 paper-work 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 its 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 re-defines 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.

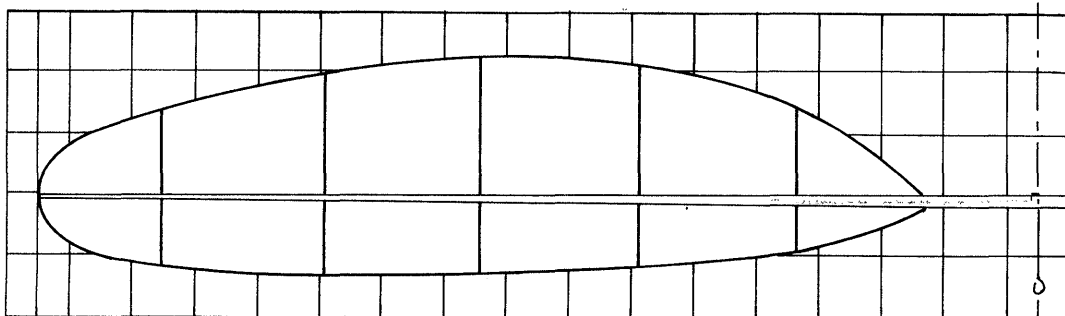
RECORDS? MAYBE!

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

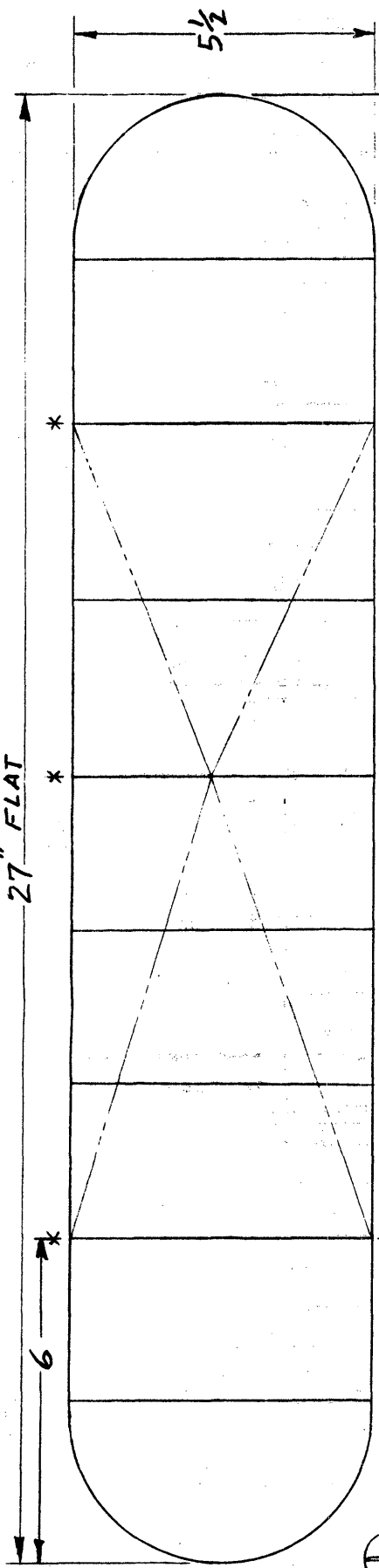
TULSA SEMI-FINALS - June 17-18, 1967 55' 6" AMA Cat. II Nat'l Guard Hangar, 41' FAI Cat. II Junior FAI Indoor - 12:12, Kristi Tenny Open FAI Cat. II FAI - 17:15, Stan Chilton

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: .063" x .110"
tapered to 1/32" square.
Jim Richmond

27" FLAT



PROP:
16" DIA.
36" PITCH

8 1/2" PORT

STARBOARD 6 1/2"

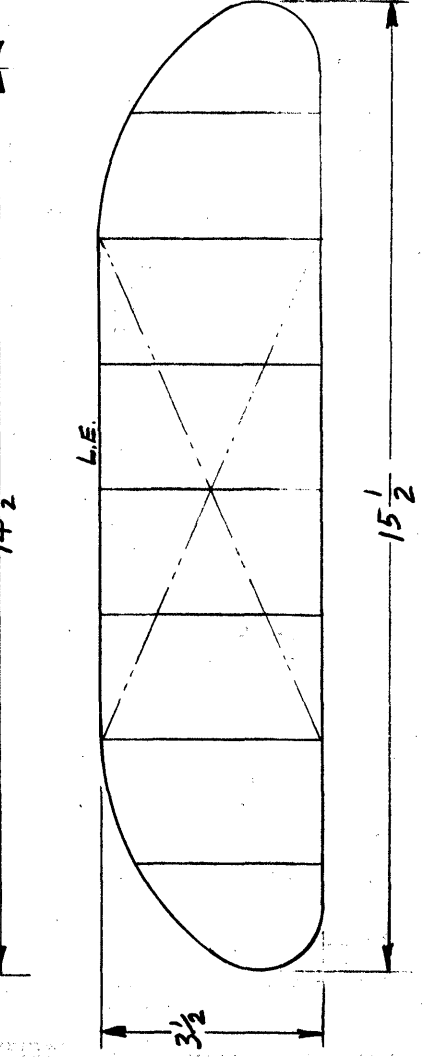
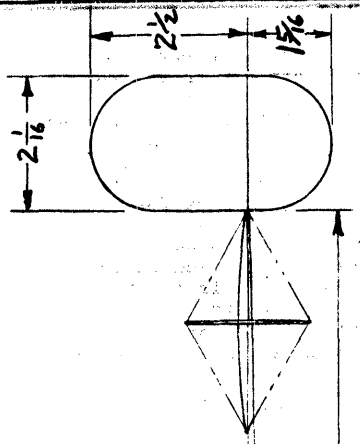
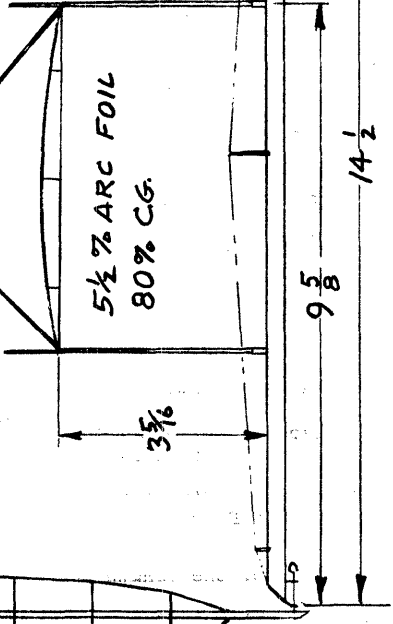
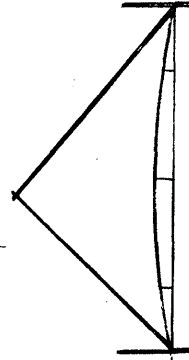
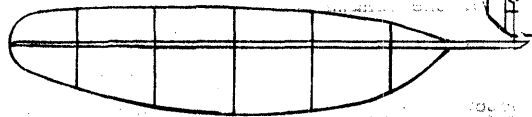
6

BEST SINGLE FLIGHT:
29 MIN. 22 1/2 SEC. WASHINGTON
PARK ARMORY 5-7-67

WEIGHTS:
WING .0089
BODY+TAIL .0132
PROP .0046
TOTAL .0267

WING:
2 5/2" PROJECTED SPAN
135 SQ. IN. PROJ. AREA

POWER:
16 1/2" LOOP .048 PIRELLI
.001 NICHROME



12

L.E.

3 1/2

15 1/2

3

DACRON WING & STAB BRACING

1/2

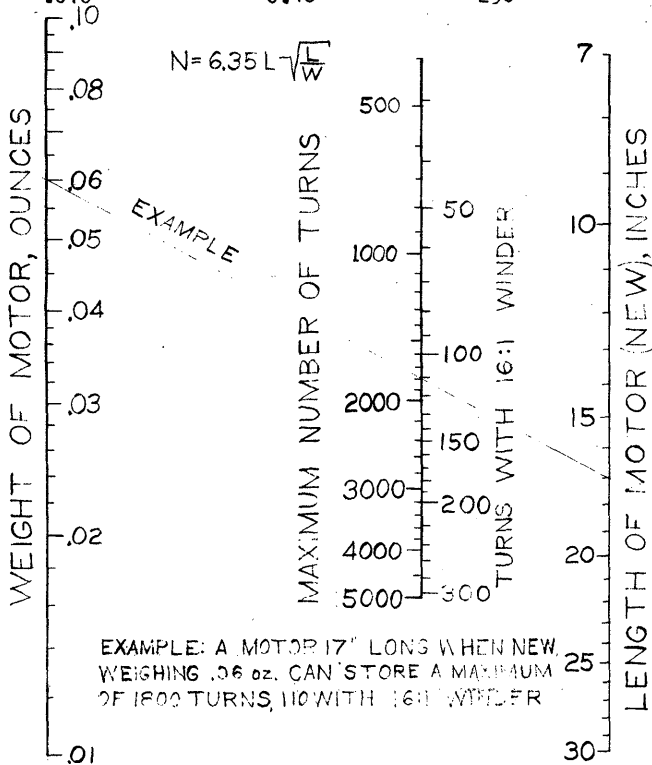
FRONT VIEW

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 nomogram were submitted by Charlie Sotich; the nomogram 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.

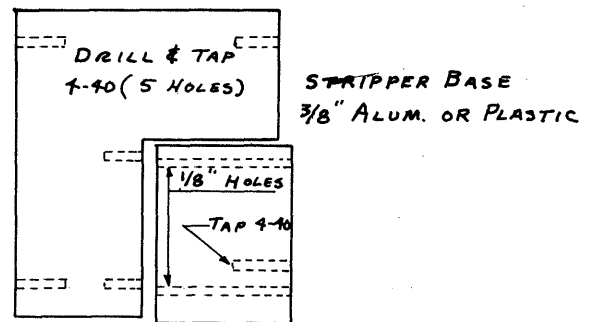
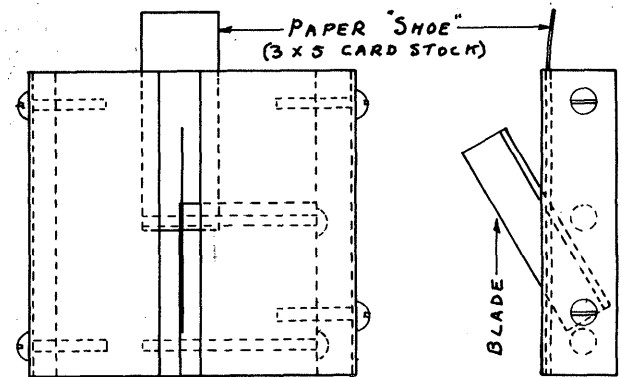
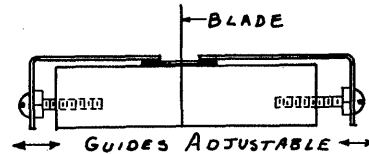
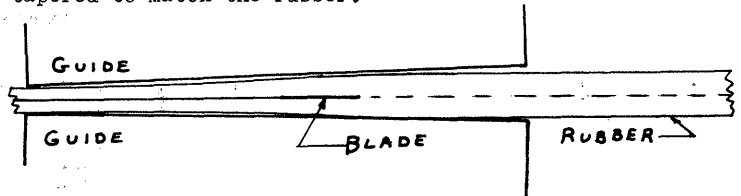
Weighing a strip of rubber and dividing by the length is a simple method of getting a meaningful average measure of rubber size. It is then easy to detect variations in rubber from different sources.

Before a flying session, a series of motors are made up of the sizes likely to be needed. The lengths are mea-

sured, 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, each 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

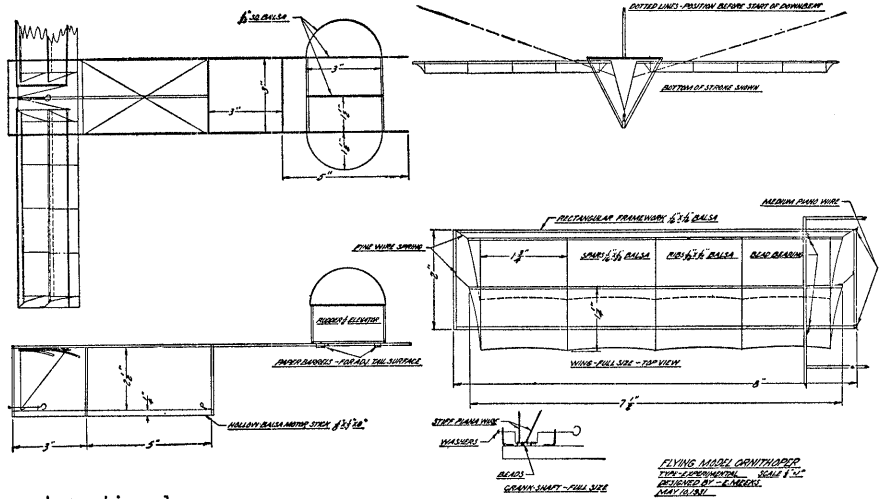
From the days of Archytas, the ancient Greek, men have been trying to fly model ornithopters. Fred Weitzel, of The Bronx, New York, having made a new indoor record of 4:30 at Lakehurst, June 11th, appears to be the undisputed 'king of the birds'. Not satisfied with that, he went on to establish a new 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.



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.

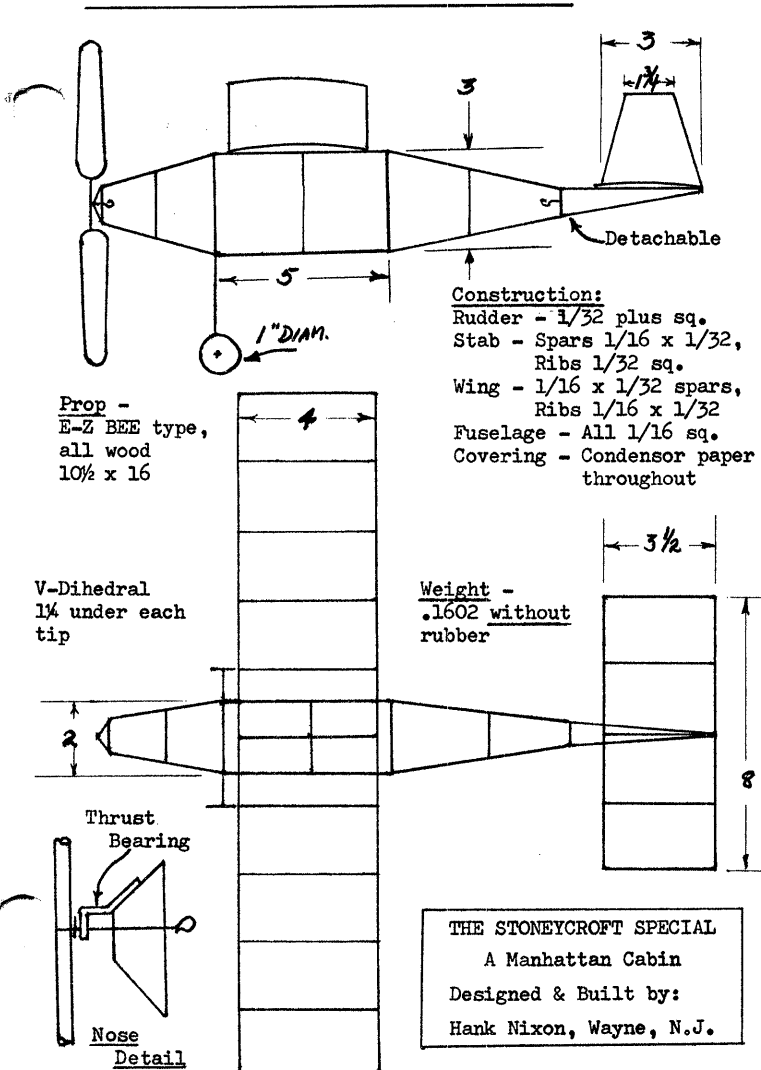
* * * *

Featured at the left is Hank Nixon's brand new Manhattan, the Stonecroft 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 issue of I.N.A.V. and later in MODEL AIRPLANE NEWS.

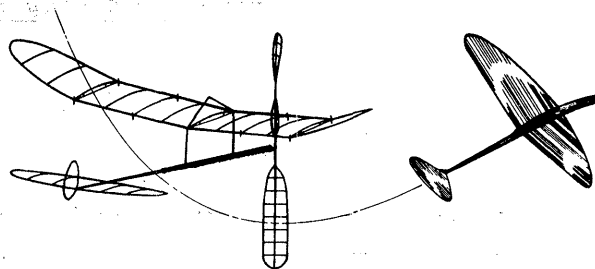
Hank used light outdoor wood in construction. He feels that, if rules required 1/16 square construction and paper covering, the beginner would be less likely to have trouble while the pro could still try a few tricks.

* * * *

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 STONECROFT SPECIAL
A Manhattan Cabin
Designed & Built by:
Hank Nixon, Wayne, N.J.



INDOOR

NEWS and VIEWS

\$2/ YEAR NIMAS DUES \$1/ YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

INDOOR HLG		INDOOR CABIN	
Junior		Junior	
1. Michael Charles	1:47.8	1. William Gibbs	11:56.0
2. Marty Thompson	1:46.2	*2. Barry Paillet	2:26.6
3. Dan Wakerly	1:42.0	3. Bruce Paillet	2:21.4
*4. William Gibbs	1:39.0	4. Gerry Geraghty	1:33.8
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 Averkleff	1:08.2		

INDOOR HLG		INDOOR CABIN	
Senior		Senior	
1. Arthur Markiewicz	2:20.2	1. David Erbach	16:54.4
2. Tim Batiuk	2:09.2	*2. Jan Serviates	9:31.0
*3. M. Smith	2:04.4	3. Mike Richardson	0:24.0
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		

INDOOR HLG		INDOOR CABIN	
Open		Open	
1. Lee Hines	2:33.8	1. Manuel Andrade	23:42.8
2. L. A. Miller	2:31.0	2. Lew Gitlow	22:59.0
3. Larry Cailliau	2:22.2	*3. Joe Bilgri	21:21.6
4. Keith Varnau	2:19.4	4. Charlie Sotich	21:09.0
5. Ron Wittman	2:12.6	5. Joe Serviates	20:03.2
6. Reid Simpson	2:09.6	6. Jim Vale	19:02.0
*7. Vic Cunningham	2:08.0	7. Merwin Bristol	17:25.0
8. Robert Patchin	2:07.8	8. Jim Richmond	14:14.6
9. Tom Hutchison	2:04.0	9. Walter Erbach	13:05.0
10. Joe Serviates	2:03.0	10. Bill Waterman	4:53

*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 ending in the HLG area. Turbulence was apparent at more than one place near the west wall, and a strong drift at catwalk level bothered many flights. Consequently, times ranged far below previous 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

INDOOR PAPER STICK		INDOOR STICK	
Junior		Junior	
1. William Gibbs	9:46.8	1. K. Happersett	21:50.0
*2. Gerry Geraghty	7:44.0	*2. William Gibbs	14:26.0
3. Barry Paillet	5:52.0	3. Kristi Tenny	13:24.0
4. Bruce Paillet	5:17.0	4. Gerry Geraghty	7:22.0
5. Kenny Happersett	3:48.0		
6. Kan Hamlyn	2:24.0		
7. Kenneth Meyer	0:17.8		

INDOOR PAPER STICK		INDOOR STICK	
Senior		Senior	
1. David Erbach	11:25.3	1. David Erbach	23:10.2
*2. Jan Serviates	9:25.0	*2. Bob DeShields	18:41.6
3. Bill Hunter	9:23.0	3. Jan Serviates	17:53.0
4. Mike Richardson	7:05.0	4. Steve Houlihan	13:30.2
5. Jerry Combs	1:34.0	5. Jerry Combs	11:42.0

INDOOR PAPER STICK		INDOOR STICK	
Open		Open	
1. Bob Randolph	23:35.0	1. Joe Bilgri	33:38.2
2. Jerry Powell	22:37.0	2. Carl Rambo	31:13.8
3. Lew Gitlow	21:32.2	3. Bud Romak	29:13.0
*4. Hal Cover	19:02.2	*4. Jim Richmond	28:52.0
5. Joe Bilgri	18:28.8	5. Walter Erbach	26:50.0
6. Merwin Bristol	17:52.7	6. Manny Andrade	24:36.0
7. Jim Richmond	17:36.0	7. Charlie Sotich	23:33.0
8. Jim Kagawa	17:11.5	8. Bob Randolph	23:02.0
9. Bill Waterman	16:25.0	9. Bud Tenny	20:47.6
10. Ned Smith	16:15.0	10. Hal Cover	19:02.0

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	<u>30:58</u>	<u>33:47</u>	17:53	27:06	27:19	64:45*
2.	Al Rohrbaugh	22:40	16:12	<u>23:33</u>	10:47	0	29:39	53:12*
3.	Clarence Mather	24:57	<u>27:10</u>	5:38	9:27	<u>25:01</u>	15:35	52:11*
4.	Bud Romak	19:38	<u>24:32</u>	<u>25:44</u>	23:24	10:00	8:14	50:16**
5.	Ernie Kopecky	2:46	0:26	<u>24:06</u>	9:00	4:10	<u>26:07</u>	50:13
6.	Erwin Rodemsky	7:42	6:35	<u>24:19</u>	3:09	22:49	<u>25:16</u>	49:35
7.	Joe Bilgri	<u>21:43</u>	10:49	<u>26:26</u>	20:10	0:18	7:48	48:09
8.	Ron Ganser	10:24	<u>20:22</u>	2:07	19:59	<u>23:46</u>	4:08	44:06
9.	Joe Hindes	6:49	<u>17:06</u>	14:52	<u>26:23</u>	0:08	5:40	43:29
10.	Bob Champine	9:35	6:46	<u>19:07</u>	5:19	<u>20:53</u>	8:03	40:00
11.	Carl Rambo	6:24	16:01	<u>16:38</u>	<u>23:01</u>	7:42	0	39:39
12.	Jim Clem	0:19	<u>20:07</u>	<u>18:36</u>	0:20	3:28	0:32	38:43
13.	Stan Chilton	0:14	0:49	5:20	0:20	<u>11:09</u>	<u>16:59</u>	28:08
14.	Dick Ganslen	9:29	<u>9:53</u>	9:15	2:05	6:22	<u>12:37</u>	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 Borne-man 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, accommodations 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, Calif. 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

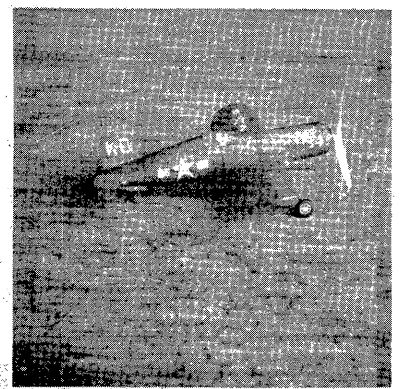
Page 3 - Indoor Nats

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!

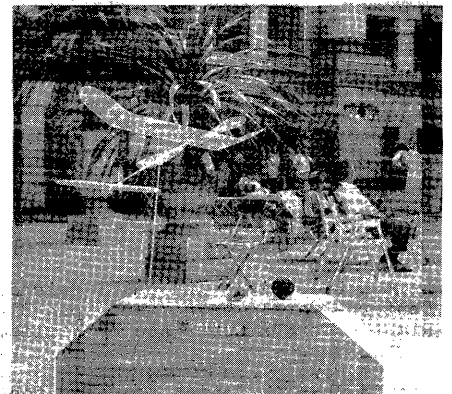
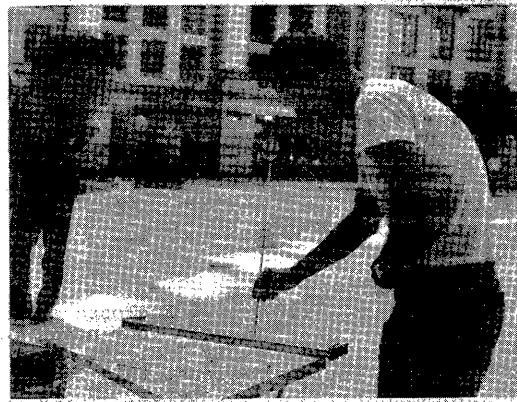
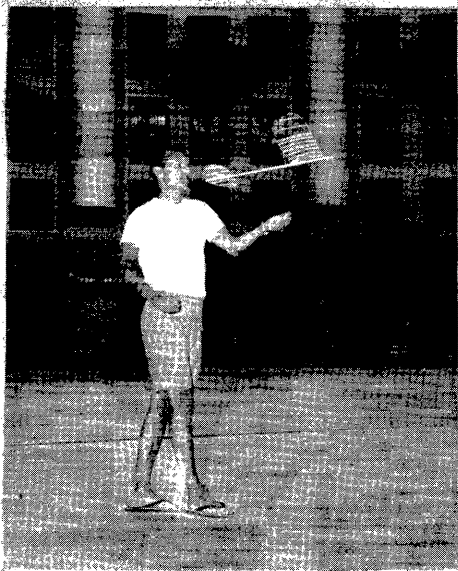
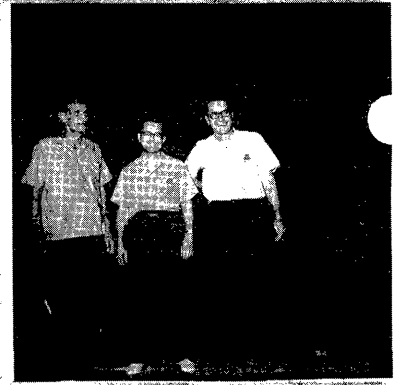
Right Column (top to bottom)

1. The team - Mather, Rohrbaugh, Richmond
2. Dick Ganglen
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 their home towns.

Indoor Scale results:

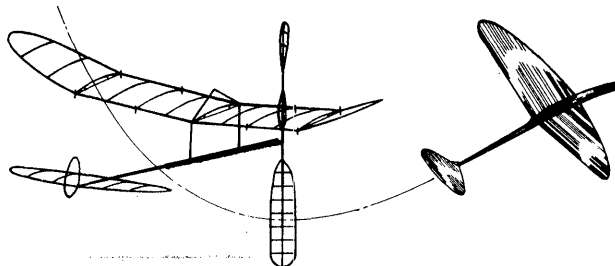
Junior Monoplane:	1. Dennis Lutz	Fokker D VII
	2. Russ Kohler	Cessna 180
	3. Mark Osborne	Shoestring
Junior Biplane	1. Douglas Mooney	Aero 101
	2. James Warner	Sopwith Camel
Senior Monoplane	1. Mike Mitsch	Eastborne
Open Monoplane	1. Fernando Ramos	1911 Cessna
	2. Jed Kusik	Bellanca YO-50
	3. William Harris	Corben Super Ace
Open Biplane	1. Harold Warner	SE 5A
	2. Joe Bailey	Bristol Scout
	3. Jed Jusik	Nieuport



INDOOR**NEWS and VIEWS**

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

****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 REPORTTeam 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.

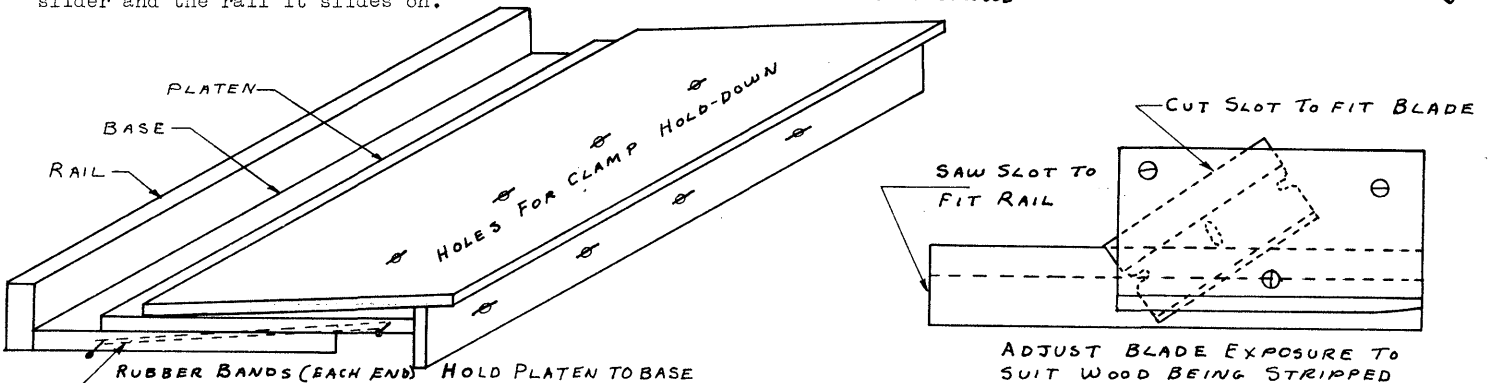
Three specific objections have arisen. First, one flier braced a wing which warped as soon as it was removed from the jig. Since that time, I have been careful to caution that dacron has a delayed strain recovery. This must be taken into account, since a strand which is pulled too hard (stretched) during 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.



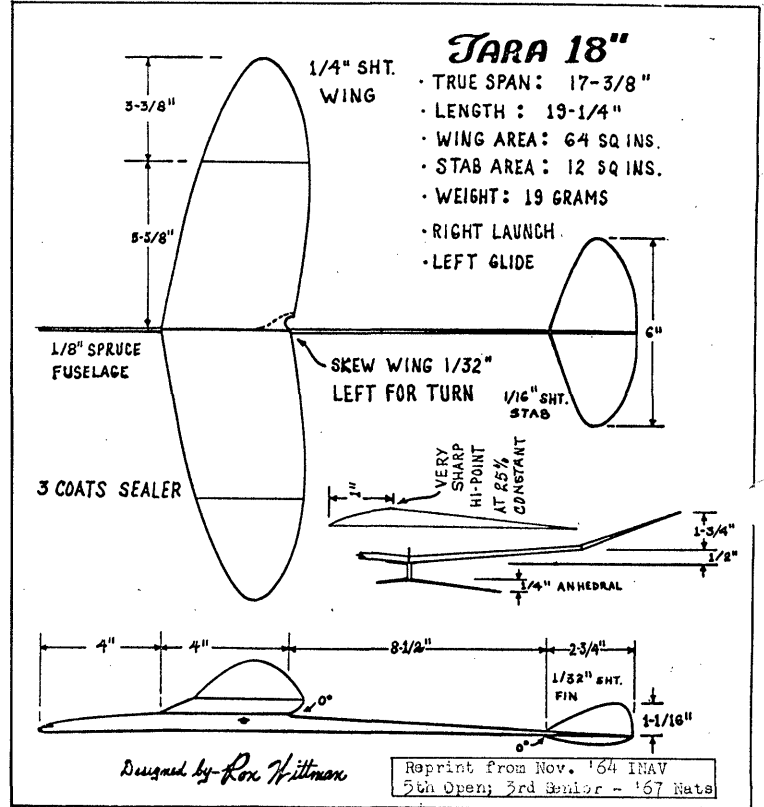
INDOOR RULES

Several items of indoor business were discussed by the FFGB 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 FFGB. 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!

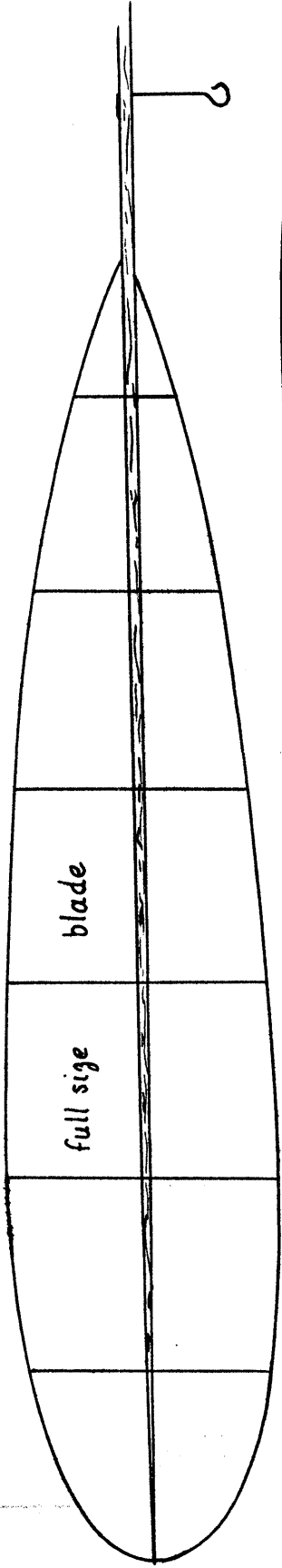
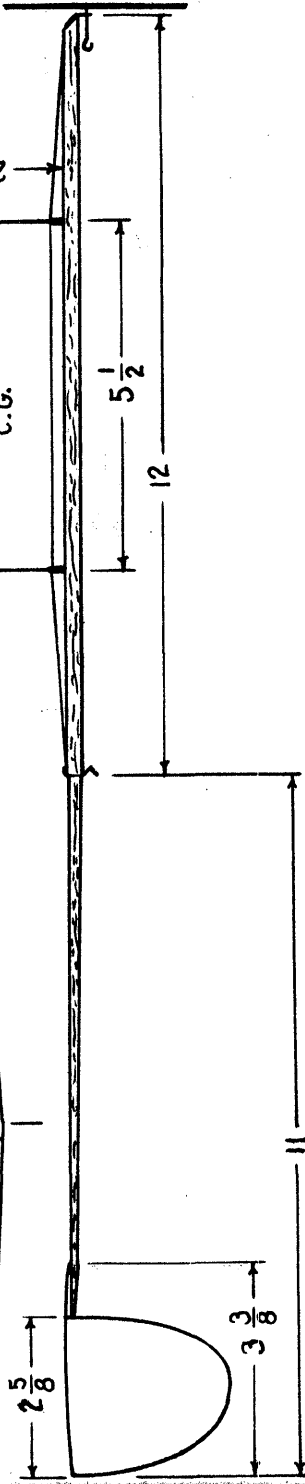
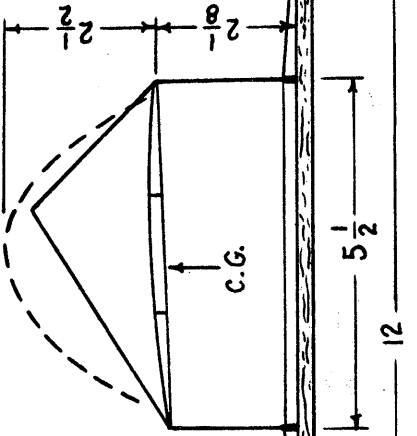
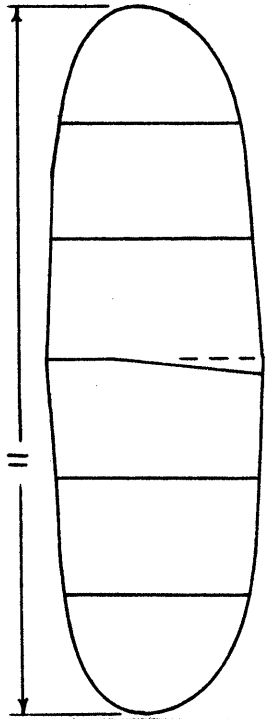
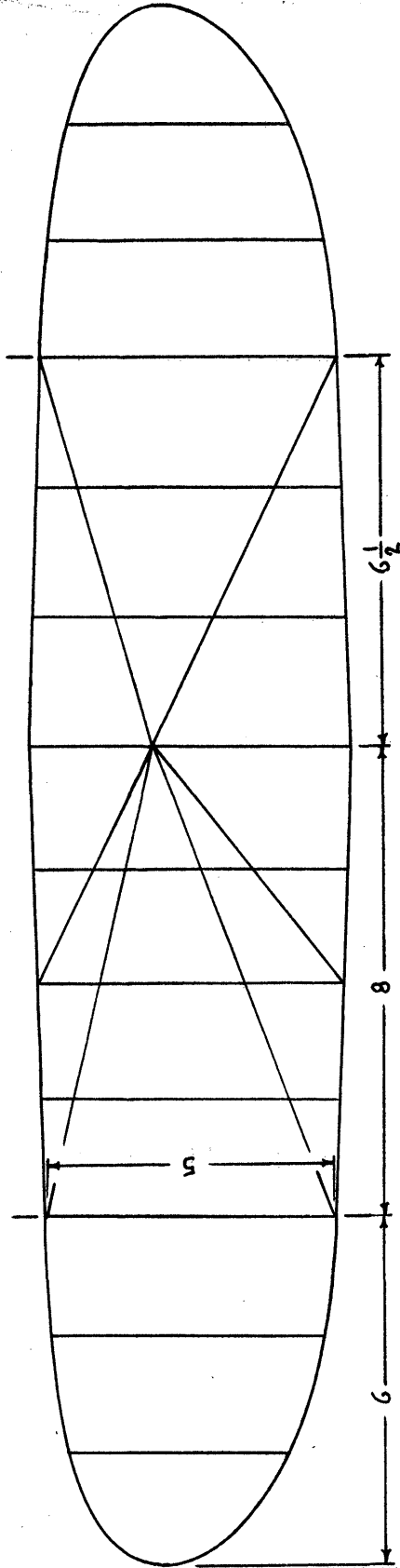
Recent issues of this column gave rise to several possible records for Jim Richmond's FAI model. AMA HQ is no longer issuing two records for a single flight, so Jim has been awarded two certificates for recent flights:

AMA Cat. II C Stick - 29:21.5
FAI Cat. III FAI - 33:47

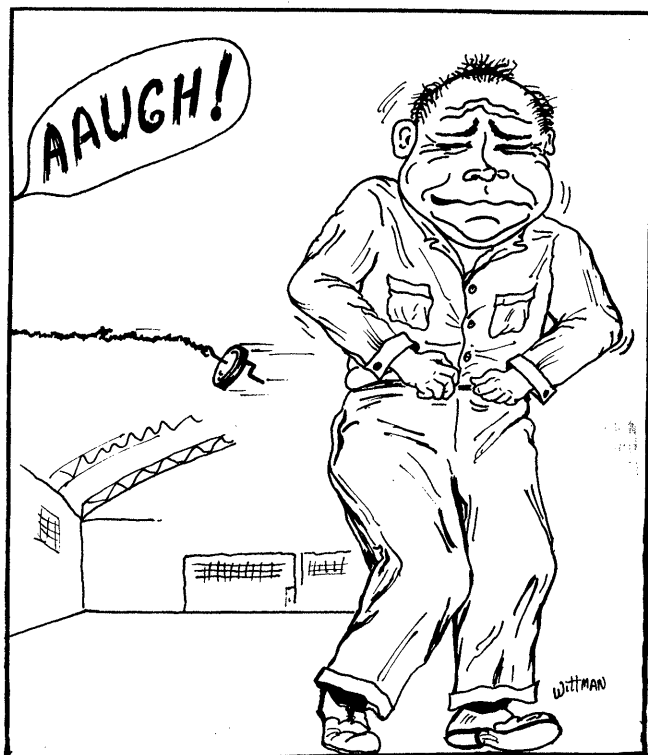


Reprint from Nov. '64 INAV
5th Open; 3rd Senior - '67 Nats

65 em FAI $\frac{1}{3}$ SCALE
 wing area 120 in²
 stab area 32 in²
 weight .026 og
 power .042" - .048"
 prop 17/30"
 C Mather



air foil



THE TRAINING OF A CHAMPION (cont. from June)

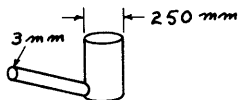
Berlin 3/19/66

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:



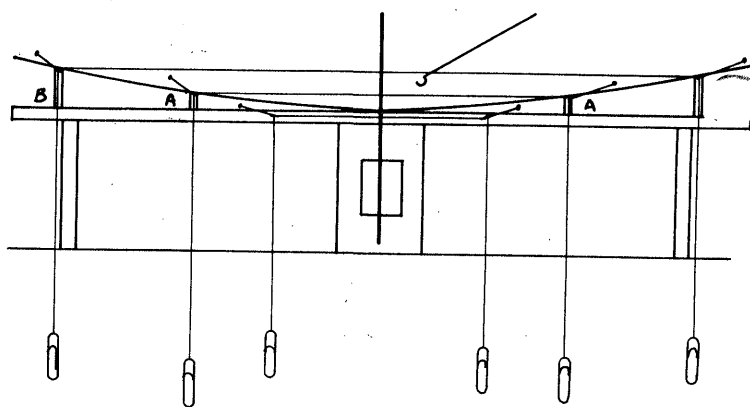
As a water-container I am using a big table with a frame of wood on it and covered with plastic sheet. The water should be 3 cm deep. The water and room temperature should be equal and low to cold. Before pouring you should draw a sheet of newspaper over the water to remove dust.

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.

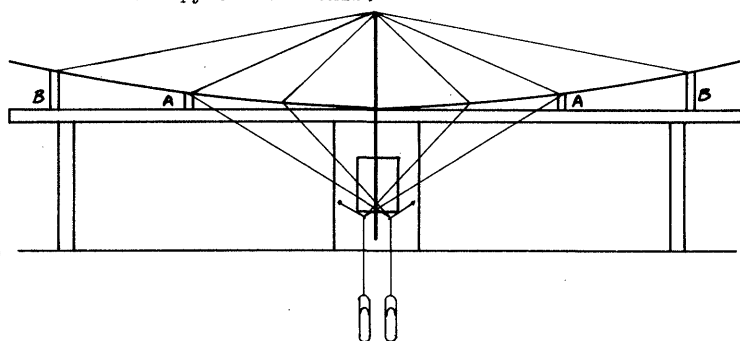
The wings are covered, lying flat on the work table, with films 1-2 days old. Before bracing, the covered flat wings should rest 2 days more. For covering stabs, the film should be at least 8 days old and before bracing the stab it should rest again 8 to 14 days. For the rudders I am using very old film. 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:



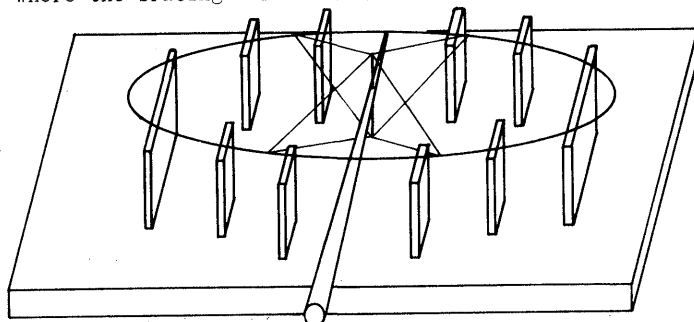
Then you lift the bracing with a hook on the top of the cabane. Then you glue the wires to the leading and trailing edges. After this remove the pins and pin them beside the pylon like this:



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,
Karlhein

INDOOR

NEWS and VIEWS

\$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!

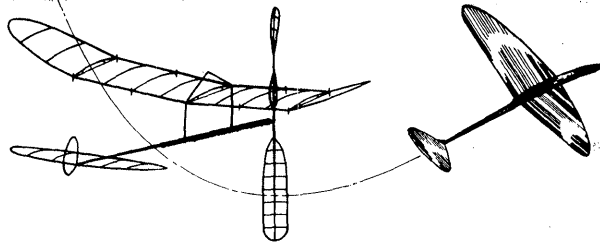
Spread The Word!

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 bal-



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

lot, 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 wall 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 stoooges. 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. Cjyarmati (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. Strattnner, 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 you 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.

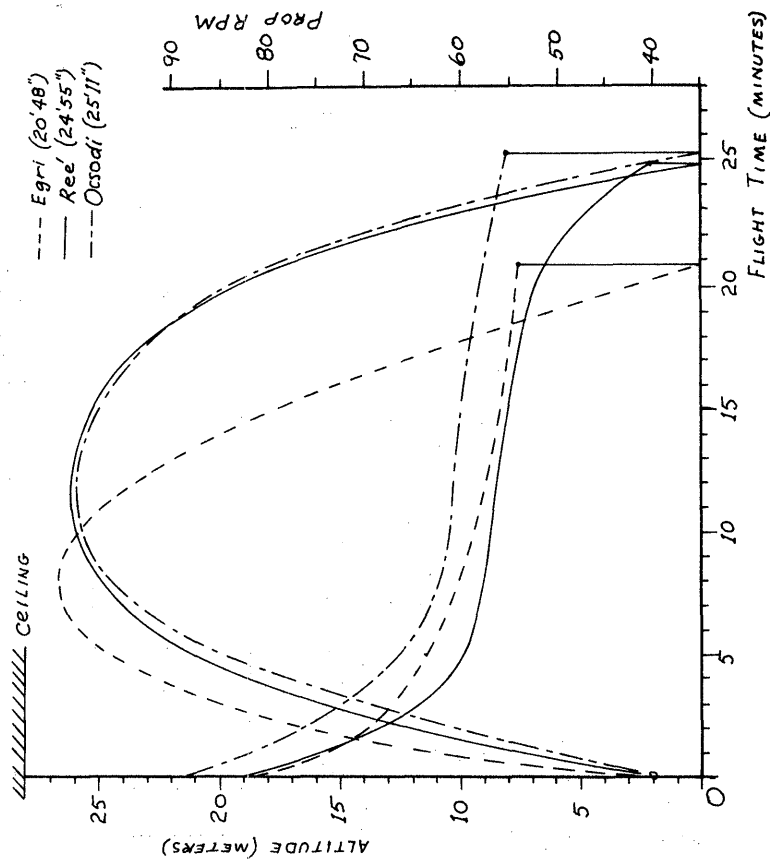
Also on this page are flight profiles taken at the May 21 contest in Debrecen. This type of flight information is quite important (as I keep saying), and the Hungarians are the only fliers who consistently record such information as far as I can determine.

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!

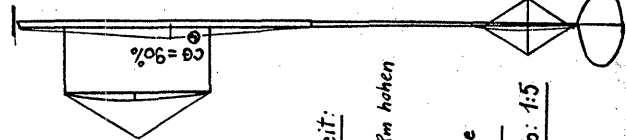


BASTARD MK II
von **MANFRED KOLLER**
Mai 67

Propeller:
Ø 400
Swig. 850

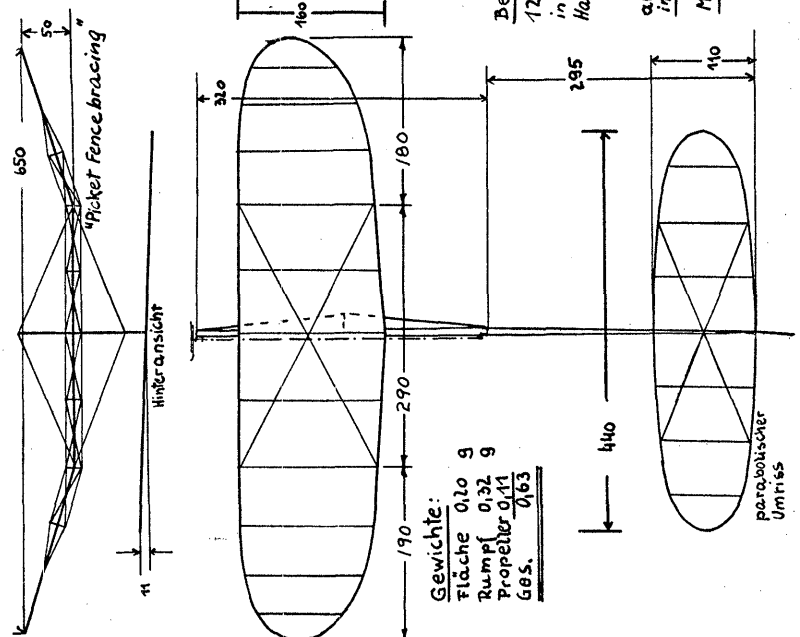


Gummi:
1 Schaumkautschuk
1x 1/4 Perelli
3 Holung



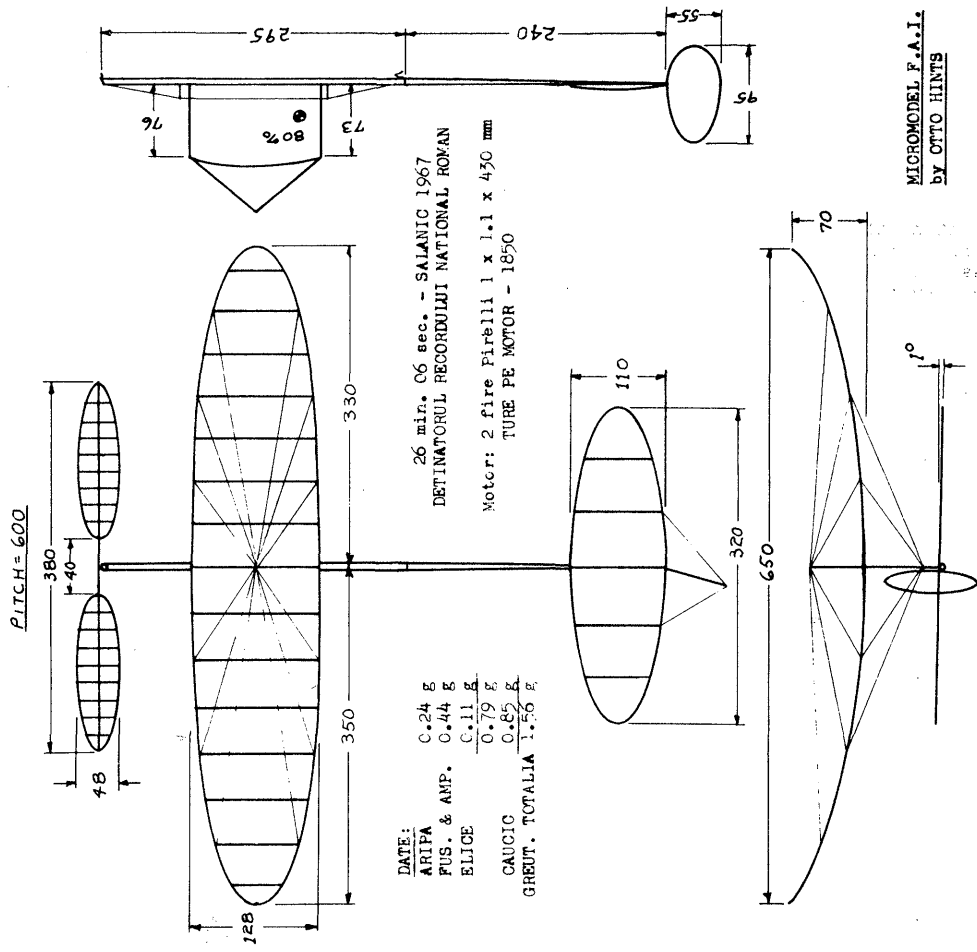
Beste Zeit:
12:08
in einer 8m hohen
Halle

alle Maße
in mm
Maßstab: 1:5

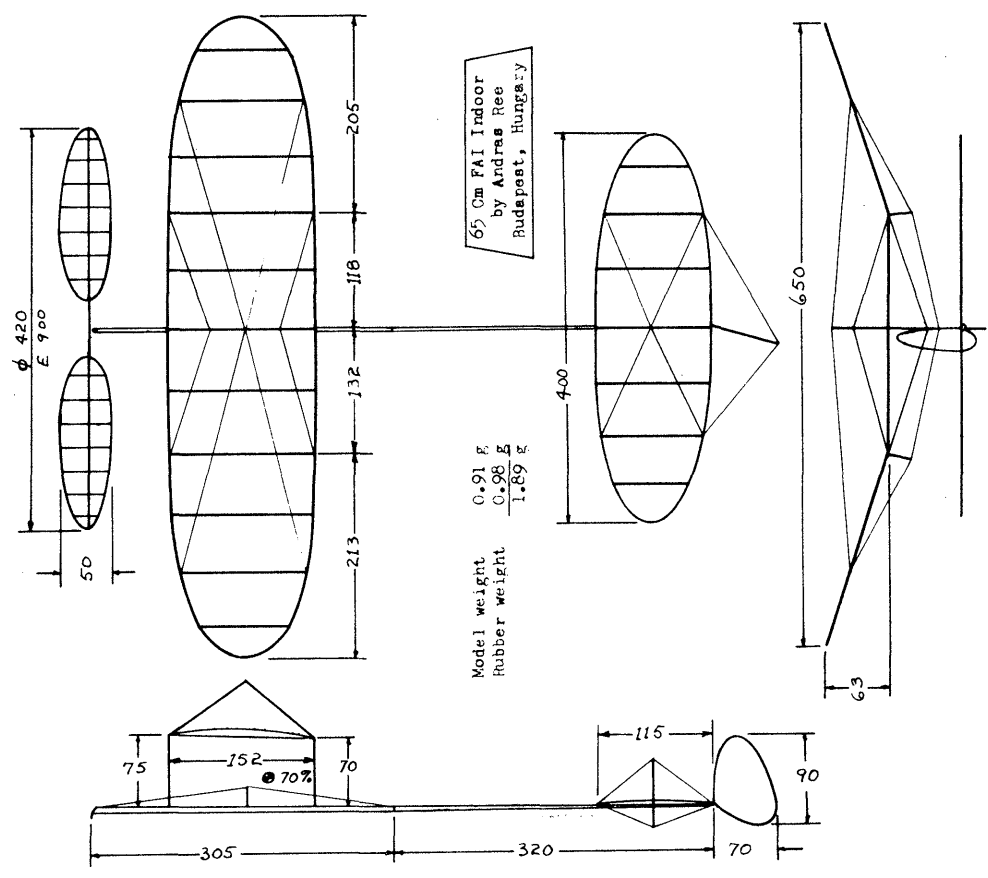


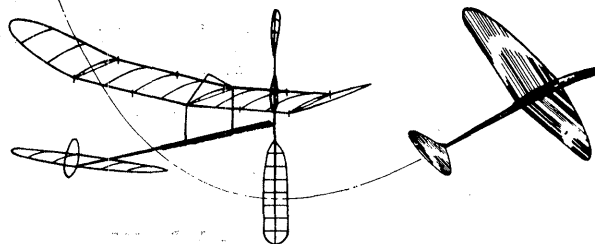
Gewichte:
Fläche 0.10 g
Rumpf 0.32 g
Propeller 0.41 g
Ges. 0.63 g

parabolischer
Umtrieb



MICROMODEL F.A.I.
by OTTO HINTS





INDOOR

NEWS and VIEWS

\$2/ YEAR NIMAS DUES \$1/YR ADDITIONAL

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

Financial Report

****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 d 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

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. Maxcutors 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: $3.14 \times$ diameter of prop at station in question \times 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:

$$1. \text{ PITCH (of block)} = \frac{3.14 \times D \times T}{W}$$

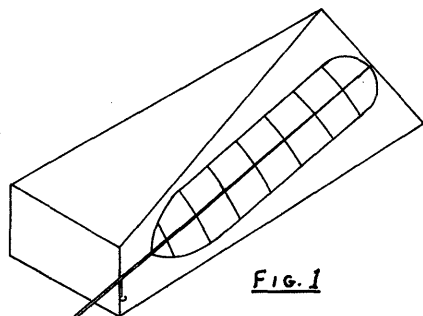


FIG. 1

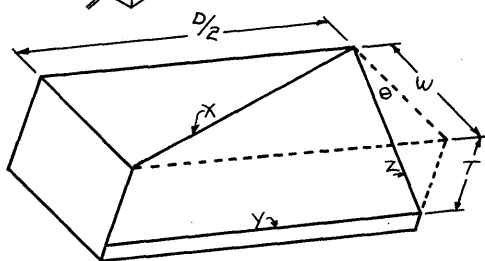


FIG. 2

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, $\tan T/W$ 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:

$$2. T = \frac{P \times W}{3.14 \times D}$$

$$3. W = \frac{3.14 \times D \times T}{P}$$

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.

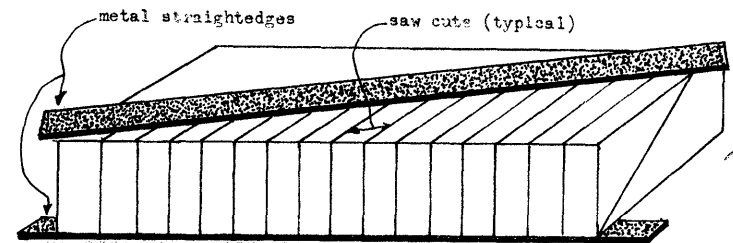


FIG. 3

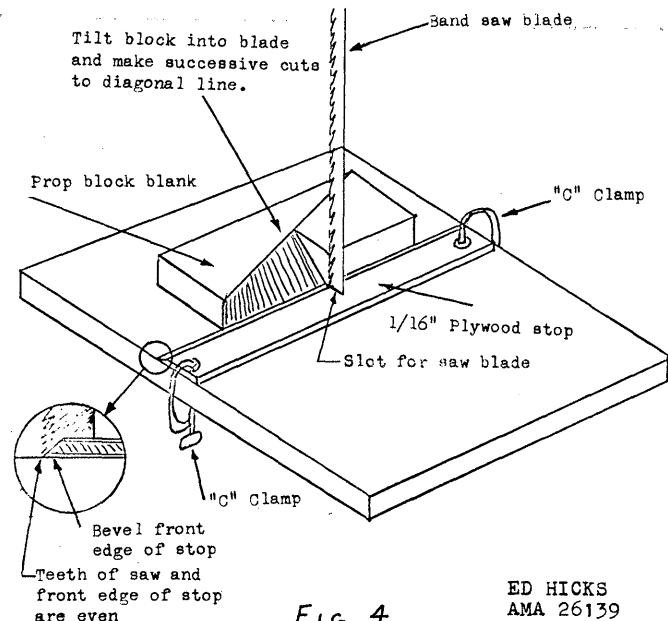


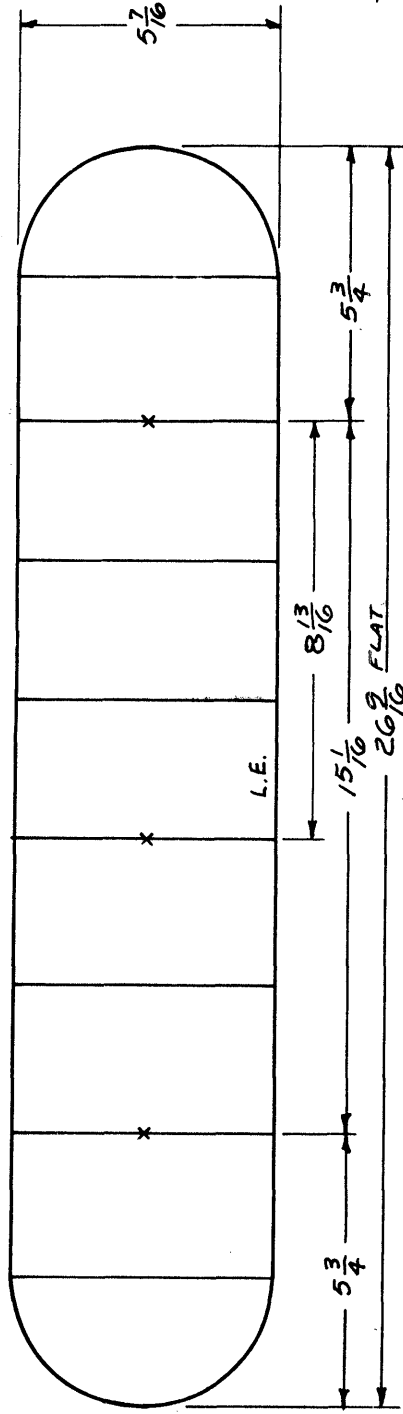
FIG. 4

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 7/16 PROJ. SPAN
132.7" PROJ. AREA



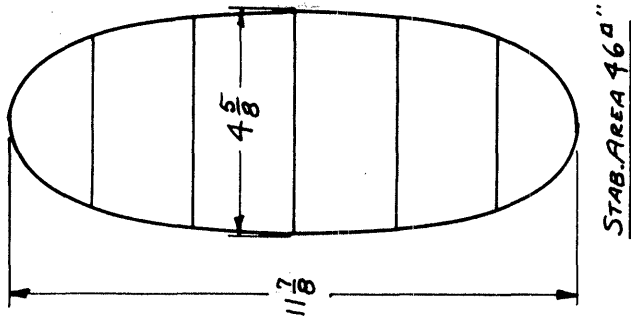
X INDICATES
COMPRESSION RIBS

WGTS.

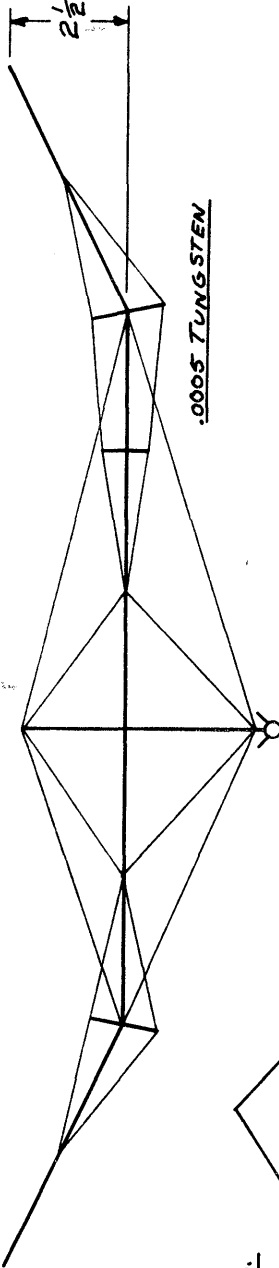
STICK ASSY. - .012
WING - .0075
PROP. - .0045
.024

18" LOOP OF .052
PIRELLI .041 OZ.

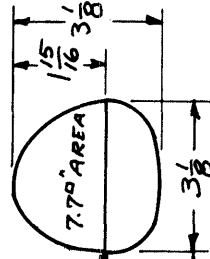
BEST TIME 29 1/2 + MINS.
POMPEIAN COURT
WEST BADEN, IND.



STAB. AREA 46"

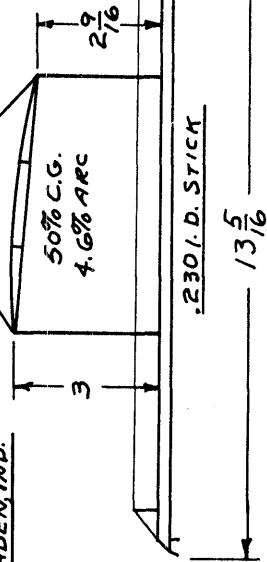


.0005 TUNGSTEN



7.70" AREA

.001 TUNGSTEN 0" INC.

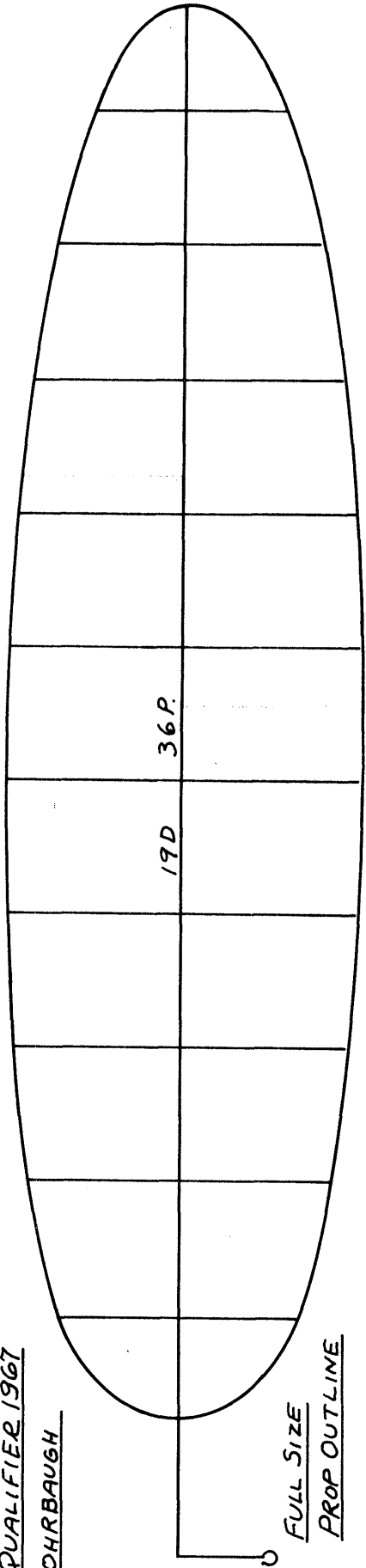


50% C.G.
4.6% ARC

.2301 D. STICK

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!

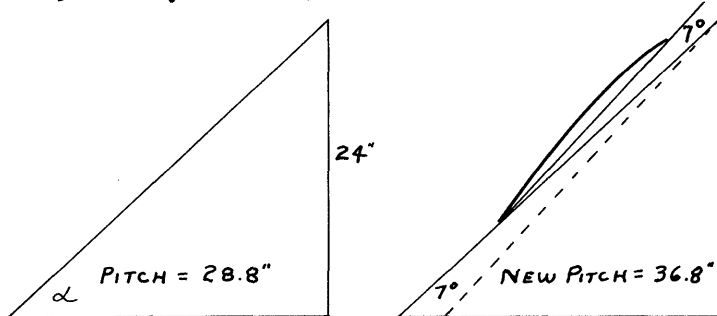
The prop is the most important component of a model, but indoor props are often misunderstood or mis-applied. A good prop, matched with proper power to even a heavy model, will give excellent results in low and medium ceilings. An excellent example of this is Hewitt Phillip's record B/FAL (May '67 INAV) - 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 $5/6 \text{ rev./sec.} \times 10$ (blade diameter at 5" radius) $\times \pi (3.14) = 26.2"$. The side of the triangle is 24", and α (model advance angle) = $\text{arc tan } 24/26.2$. From the definition of pitch:

$$\text{Pitch} = 3.14 \times \text{Dia.} \times \tan \text{Blade Angle}$$

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) = $\text{arc tan } 24/26.2 = 42.6^\circ$. 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.



$$10 \pi \times 5/6 = 26.2$$

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 result 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.

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 any 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 very 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 turns when 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.

INDOOR

NEWS and VIEWS

\$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

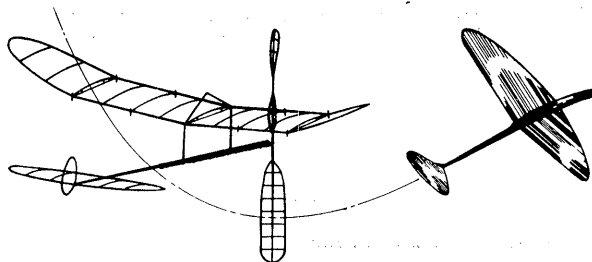
Although most of the available technical space in INAV will be on props for an issue or two, there is a microfilm series waiting in the background. This will begin with a review and updating of the series which began in Oct. '65 and ran thru May '66 (this was requested by readers). New material will 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 questionnaires (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 questionnaire. 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, nitro-cellulose, 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



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75081

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 stooze.
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. Maxcutors sessions at Kennedy High School - 7 pm to 11 pm. Jan. 12, Jan. 26. Tom Vallee - phone 498-0790; 444 Henryton Se., 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.

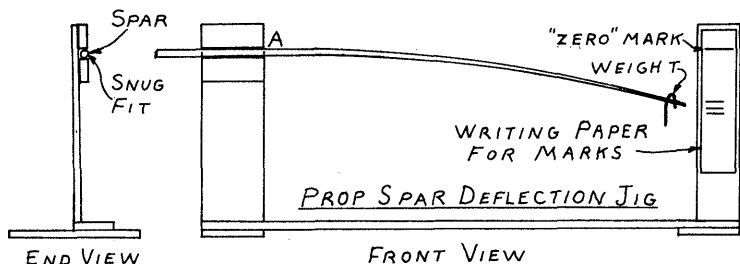
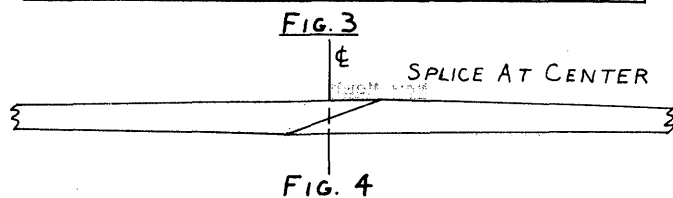
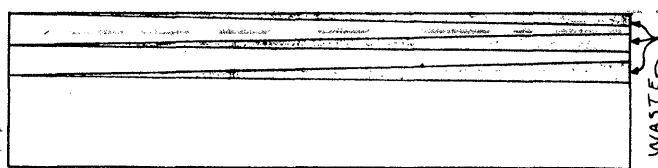
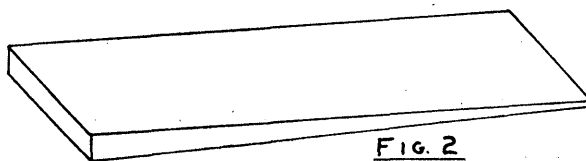


FIG. 1

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.



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).

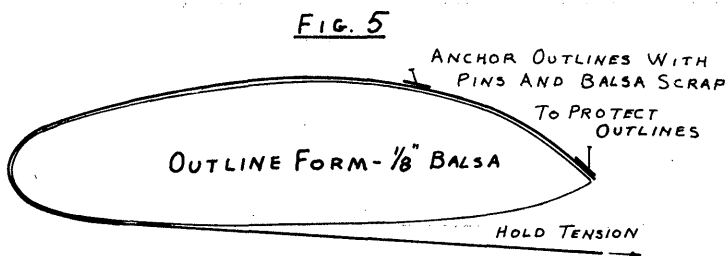
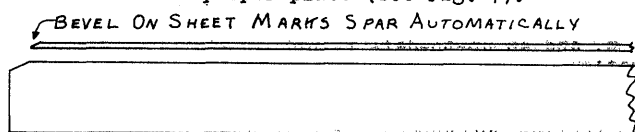


FIG. 6

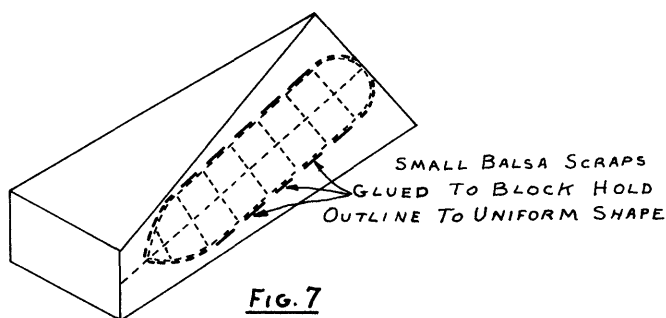
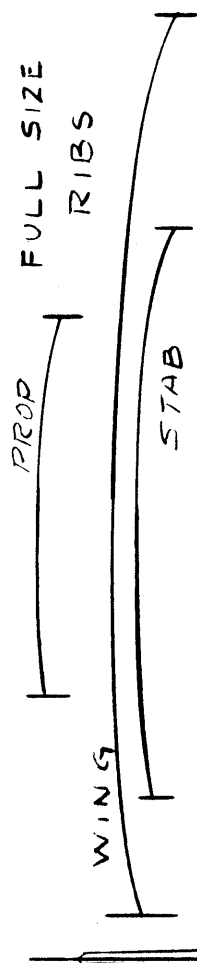
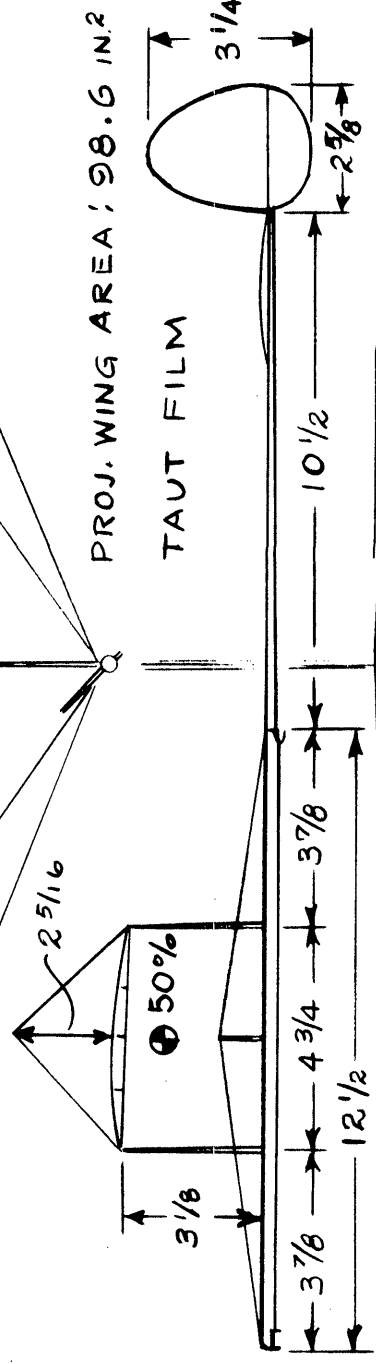
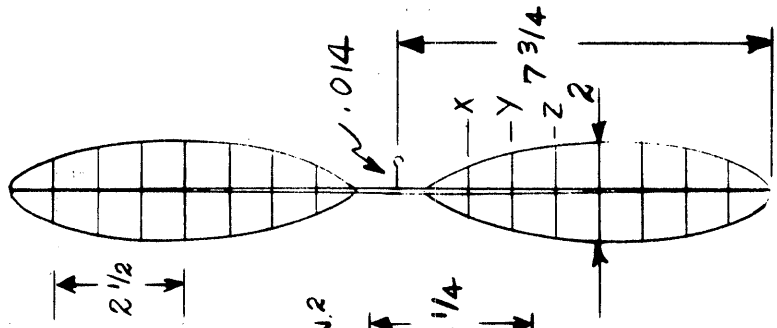
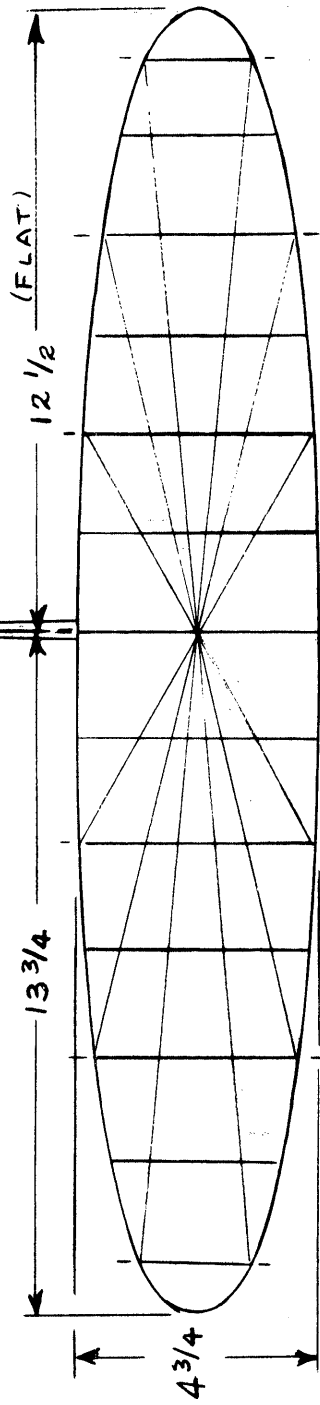


FIG. 7

WEIGHTS: WING - .0089
 PROP. - .0057
 STICK + TAIL - .0119
 TOTAL - .0265 OZ.



PROP: 15 1/2 X 32
 POWER: .038 X
 14 1/2 PIRELLI



"GOLDILOX"
 1967 FAI BY
 STAN CHILTON

TRACED BY - GEO. BATIUK SR.

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 = $3.14 \times \text{Dia.} \times \tan \text{Blade Angle}$, 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.

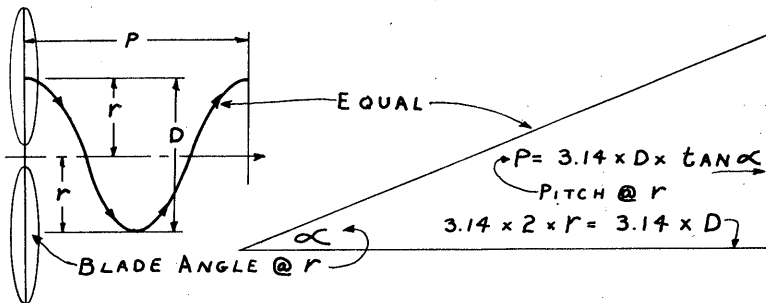


FIG. 1

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 proven. 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!

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.

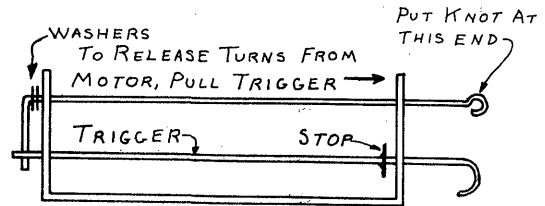


FIG. 1

Fig. 2 shows Jim Richmond's torque stooze. The shaft from Fig. 1 is replaced with a torque meter 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.

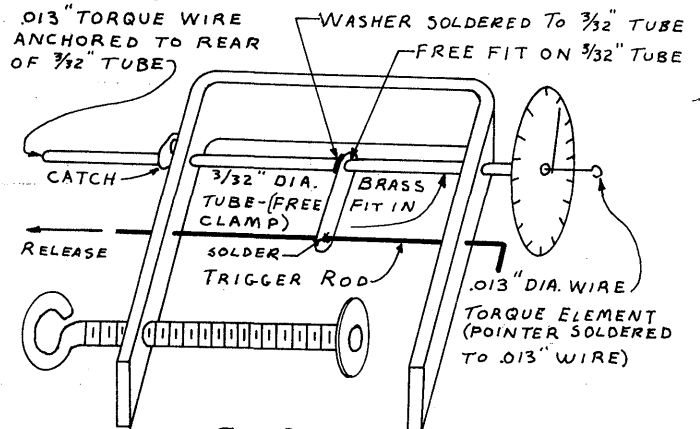


FIG. 2

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.

