

# INDOOR

## NEWS and VIEWS

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

### New Members!

ROBERT W. GEER, 2922 S. Garfield, Denver, Colo. 80210  
 GEORGE RIVERS, 3408 Boller Ave., Bronx, N. Y. 10469  
 RICHARD SIRONEN, 1349 S. W. 174, Seattle, Wash. 98166  
 THOMAS F. STONE, 6305 Inca Rd., Ft. Worth, Tex. 76116  
 DAVID R. THOMSEN, 5432 Haft Rd., Cincinnati, O. 45239

### Special Action Committee

For those who may have missed opening announcements of S.A.C., this is an energetic action of NIMAS members who seek to aid beginners in indoor flying (of all ages, but with special emphasis on youth) in learning how to build and fly indoor models. The effort in preparing materials for instructors was spearheaded by Phill Lawry and Roger Schroeder, and a total of 20 instructors in various parts of the country have volunteered to help as needed. The most recent volunteer instructors are listed below, with others listed in November and December '69 INAV's.

Carl Nye, RD #1, Cortland, New York  
 Dave Linstrum, 12 Holcomb St., Simsbury, Conn. 06070  
 Jim Davidson, 1815 Melbourne Ave., N.E., Huntsville, Ala. 35801

Actually, Dave Linstrum was originally listed as an instructor in St. Louis, Mo., but he has moved and is reaffirming his willingness to help.

### Telephone Numbers?

The Nov. '69 INAV noted that some NIMAS members would like to know the numbers of other NIMAS members so they can call as they travel around. Numerous people have responded by sending their numbers - how about you?

### Change of Address

Dave Linstrum, Manager of the FF Team Selection Program, has moved: 12 Holcomb St., Simsbury, Conn. 07060.

### Fudge Factors?

Over the years, NIMAS members have cooperated in their postal meets, to the extent that standard "fudge factors" have been developed to permit competition between teams in sites with different ceiling heights. At present, there are two ways to fudge HLG flights, and one formula for equalizing rubber flights.

HLG's are fudged one of two ways, depending upon the amount of difference between the two ceiling heights. If the high ceiling is over 1.5 times as high as the lower one, there is a graph which is used. For smaller differences, this formula is used:

$$\text{Fudge} = (\text{high ceiling})/(\text{low ceiling})$$

The numerical value of the fudge factor is multiplied by the flight times from the lower site; the resulting times are then compared directly with those from the high ceiling site. For rubber models, the same procedure is used, except that the following formula is applied regardless of difference in ceiling height:

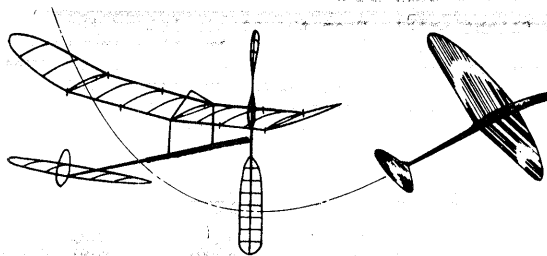
$$\text{Fudge} = \sqrt{(\text{high ceiling})/(\text{low ceiling})}$$

It has almost become standard for teams flying postal meets to use the FAI method of measuring ceiling height, as is now being done in the NIMAS Award program.

### Top Ten Ceiling Dodgers

Last month, a casual mention was made of the concept of listing flights that didn't touch the ceiling - in other words, no rafter-banging or ceiling scrubbing. This really ought to say more about who has the most efficient models? Anyway, four fliers immediately and enthusiastically sent in times to begin the listing:

	Time/ceiling	Fudge (to 35')	Est. Altitude	Score
1. Hal Crane	682/20'	1.32	19'	850.2
2. Hewitt Phillips	428/20'	1.32	7'	564.9
3. Roger Schroeder	239.5/15'	1.53	13.5'	365.9



4. Harry Cook 237/15' 1.53 13' 362.6

Ground rules for future listings: Submit times with FAI measure of ceiling height and your estimate of how high the model actually went. The times will be fudged to 35' (using ceiling height; the estimated altitude can be used either for speculation or scaring the competition) and posted for the honor (?) and maybe a prize if there is enough interest. Times must be submitted by the first day of the month to be listed in that month's issue. Send entries to Bob Putman, 507 Darlene, Arlington, Tex. 76012

### Peanut Scale

We recently had a request for a copy of the rules for Peanut Scale; Bill Hannan then sent this comment: "The original rules were very 'loose', since PS was always conducted as a sideline 'just for fun' event, and was never taken too seriously at first. What has happened, however, is that a great many modelers have been attracted by the class. During our recent Flightmaster Annual, several fliers entered ONLY Peanut Scale! To top that, a number of the avid R/C boys have even entered into the PS action, which really amazed all of us. Thus, the event has outgrown its original concept, and the Bridgeport, Conn. "Flying Aces", who originated the idea, are hard at work on a new set of rules, which should be ready shortly. Every effort is being made to preserve the 'fun' spirit, and the judging will be kept simple."

As a sideline to Bill's commentary, I would like to note that the PS plans that Bill has for sale are very good. Not only are they well presented, but the structure is well engineered and the models are assembled from an absolute minimum of pieces. This should yield quickly built models - which seems to be part of the fun. Send Bill a card at P. O. Box A, Escondido, Cal. 92025 and ask him for a catalog.

### NFFS Design Competition

The National Free Flight Society and AMA are co-sponsoring a design competition for a small field rubber powered model. Entry deadline is April 1, 1970, and an entry blank and set of rules can be obtained from Annie Gieskieng, 1333 S. Franklin St., Denver, Colo. 80210.

### Rubber Strippers Available

Bob Dunham has offered to open up his production line on Bilgri-type strippers once again. These are very nice units made from plexiglas, and work very well with either a single blade or multiple blades (see Jan. '67 INAV). The price is \$5 per unit, with deadline for ordering set for Jan. 20, 1970. All units will be produced at the same time, according to orders on hand Jan. 20. Send orders to Bob Dunham, 4730 S. Yorktown Ave., Tulsa, Okla. 74105.

### INDOOR RULES

The following comment was recently received on autogyro and ornithopter rules; send your comments and rebuttals to Box 545, Richardson, Tex. 75080 and they will be forwarded to the author of the comment:

"The flapping surfaces on the ornithopters have merely become replacements for propellers; their fixed wings supply all the lift. I saw Carl Goldberg fly his ornithopter at the 1946 Mats, and it did well. I would guess that 85% of the wing area was in the flapping portion, with only a small fixed center section. There was none of this business of a fixed wing separate from the flapping wings.

The autogyro rule should be changed to eliminate all fixed wing surfaces. Models of this type will fly. Most record-setting 'gyros of recent vintage would fly much better without their rotor assemblies, since the fixed wings are doing all the lifting and rotors are along for the ride."

An editorial comment on the above: There have been a few heated arguments on the above topics. From the standpoint of the CD, it is particularly difficult to tell if an autogyro rotor is really contributing to the lift or not. One flight in particular was observed where the rotor stopped, then reversed direction without visibly

affecting the flight path! From the standpoint of the FCCB, only a major increase in activity in these events would really justify time spent on new rules - they are almost dead and this is a shame. They are interesting events that could benefit greatly from modern materials and techniques, and offer a unique challenge.

#### TOP TEN EASY B

	Time/ceiling	Fudge (to 35')	Score
1. Bob Platt	575/20'	1.32	760
2. Hal Crane	525/692	1.32	692
3. Jim Walters	675/37'	.972	656
4. Clarence Mather	590/30'	1.08	637
5. Joe Portecorvo	516/24'	1.21	623
6. Joe Deady	636/37'	.972	618
7. Pete Patterson	492/24'	1.21	594
8. Jim Clem	416.5/22.3'	1.25	520.6
9. Harry Cook	319/15'	1.52	484.9
10. Howard Haupt	384/25'	1.18	454

#### Top Juniors

1. David Sandelius	460/37'	.972	447
2. R. J. Dunham, Jr.	467/41'	.92	431
3. Richard Sironen	441/36'	.986	434.6
4. Jimmy Clem	254/22.3'	1.25	317.5
5. Kim Mather	255/25'	1.18	302
6. Neal Rozelle	287/35'	1.00	287
7. Paul Brown	221.8/22.3'	1.25	277.3

#### CONTEST CALENDAR

ALABAMA - Huntsville. AA Indoor contest at Madison Co. Coliseum in Huntsville, Mar. 15, 1970. HLG - Jr & Open; Easy B - Jr.; Paper Stick, Indoor Stick & Scale - Open. CD - E. J. Minter. For info: J. T. Davidson, 1815 Melbourne Ave., NE, Huntsville, Ala. 35801, ph. 539-1509.

ARIZONA - Phoenix. Indoor sessions in Arcadia High School Gym, 7 pm to 10 pm, the second Tuesday each month. Contact Terry Thorkildsen, 3103 W. Willow Ave., Phoenix, Arizona 85029 for further details. Cat. I site.

ILLINOIS - Chicago. Cat. I indoor sessions at Girl's Gym of Forest View High School, 2121 Goebbert Rd., Arlington Hts., Ill. Sessions each Sunday, 9 am to 5 pm, except Feb. 8, 1970. Call Al Sortwell at 312-439-1497 for info and directions to the gym.

MARYLAND - Silver Spring. Indoor sessions at JFK High School, 1901 Randolph Rd., Silver Spring. Jan. 16, 30; Feb. 20, 1970. 7 pm to 11 pm.

MASSACHUSETTS - M.I.T. Cat. II indoor sessions at MIT Armory, Mass. Ave. & Vassar St., Cambridge, Mass., 3:30 pm to 6:30 pm, Jan. 31, Mar. 7, 1970. Indoor contest April 11, 1970, 1:30 pm to 8:30 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass., ph. 358-4013.

NEW YORK - Long Island. Cat. II indoor contest at Canteague Park, Hicksville, L. I. May 3, 1970. Site is 190' dia. dome, 50' high. HLG, Easy B, Indoor Stick, Paper Stick, Scale. CD - Bill Dunwoody, 985 Ft. Salonga Rd., Northport, L. I., N. Y.

TEXAS - Ft. Worth/Dallas/Denton. Cat. I indoor meet at Ballroom of Texas Woman's Univ., Denton, Texas. Jan. 17, 1970, 10 am to 5 pm. HLG, Paper Stick and Catapult glider for Jr. & Sr-Op.; HLG and AMA Cub for Sub-Jr. Jim Clem, 8240 Green Hollow, Dallas 75240, 214-235-4603.

WISCONSIN - Milwaukee. Indoor sessions each Thursday from 7:30 pm to 9:30 pm at Sherman Social Center, North 51st St. and W. Locust St. Ken Kraemer, 3945 N. 41st St., Milwaukee, Wisc. 53216, ph. 414-442-5864.

#### POSSIBLE NEW EVENT?

A couple of fliers have suggested, at various times, that indoor needs an event larger than Easy B (for better relative flight performance), and with less design limitations. The most recent suggestion has incorporated these basic features: FAI span (65 cm), a minimum weight, and maximum rubber weight to be half the airframe weight.

The disadvantage of the rules is that the indoor CD would be required to furnish a scale. However, it has been suggested that the airframe weight be made equal to that of a U. S. nickle (approximately .2 oz.). Thus, a simple ratio scale with two hooks and one pan to place the nickle in would suffice.

The proposed class should have the advantage that the beginner suffers only from lack of experience in building and flying, without the psychological handicap of a weight problem. Light indoor models seem to be a necessity in all but low ceilings; this is the major stumbling block for beginners. If they manage to approach the same weight as experienced builders, they break the model from lack of handling experience. When they build models they can handle, they feel the model's weight will beat them.

The FAI span limitation trains people in handling that model size while giving a model large enough to fly well in spite of the high wing loading. The limit on rubber weight lowers the overall weight (giving slower airspeed) and places emphasis on proper application of power without requiring super-strong fuselage of near-zero weight.

Drop a line to Box 545, Richardson, Tex. 75080, and express your feelings about this class. Has it a place in indoor, and do you feel it would encourage more fliers to fly? Even though indoor is still growing, much of the increase is in scale and Easy B, which isn't really going to help expose fliers to the pure duration aspect of our obsession/hobby/sport.

#### RECORDS? MAYBE!

BRAINBUSTERS RECORD TRIALS, Dec. 27-28, 1969, Cat. I Willis School, Hampton, Va. 20' ceiling. Open Helicopter - 10:36, Hewitt Phillips (Hewitt also made flights of 8:07, 8:48, which also exceeded the existing record.)

OAKLAND CLOUD DUSTERS Cat. II meet, Dec. 13-14, 1969 Cow Palace, San Francisco, Cal. 96' ceiling. Open AMA Cat. II FAI - 34:57, Jim Richmond. Open FAI Cat. III FAI - 34:57, Jim Richmond.

#### POSTAL CHALLENGE

Jim Haught, 4004 E. Kemper Rd., Cincinnati, O. 45241 offers both a postal challenge and a fun event: Build a "Tenny Easy B" directly on the magazine plans (Oct. '67 AM), to the following rules: (Jim calls this a MINI-BEE)

1. Use the AM plans only, except it is permissible to make the tips square instead of slanted.
2. No bracing; solid motor stick and boom, sheet balsa prop.
3. Tissue or condenser paper covering only.
4. Make flights before witness and have witness sign results sheet.
5. Enter times in one or more of the following ceiling categories:
 

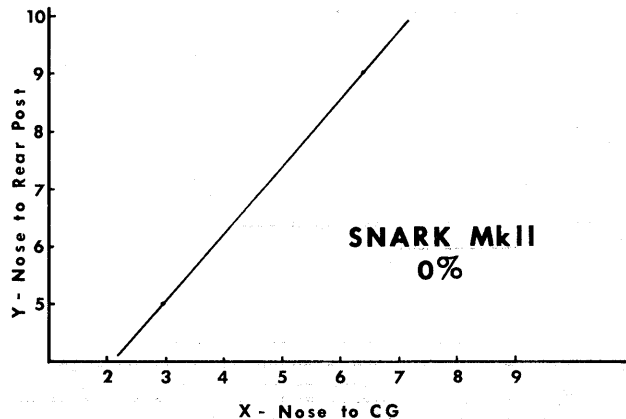
Cat. A - 10'	Cat. D - Over 50'
Cat. B - 30'	Cat. E - Outdoors
Cat. C - 50'	

Since this makes a 6" span model, it won't take much time to build. He suggests that prop blades be made paddle shaped, and that rubber sizes between .020" and .030" will be about right.

Deadline for entry is March 15, 1970; send your entry to Jim at the above address.

#### STATE OF THE ART

The featured model for the month is one of the top low ceiling designs currently being flown - Tom Vallee's Snark Mk II. The plans list three records the model has set in 1969. In addition, it has placed well in several contests and served as a flying "test bed" for low power experiments along the line proposed in INAV in various 1964 issues. Finally, the model was used to compile data for "Hall Meteorology, Hall Geometry and Low Ceiling Duration", Tom's paper in the NFFS SYMPO 2. If you haven't read this, now is the time. It has many hints for contest flying in poor air (typical winter contest air!) and other strategic flying hints. The usual CMOS balance chart is presented below, calculated for 0%. If Tom drew his plan to scale (regarding wing location), he flew it at about + 1% stability margin, with no trouble from turbulence.

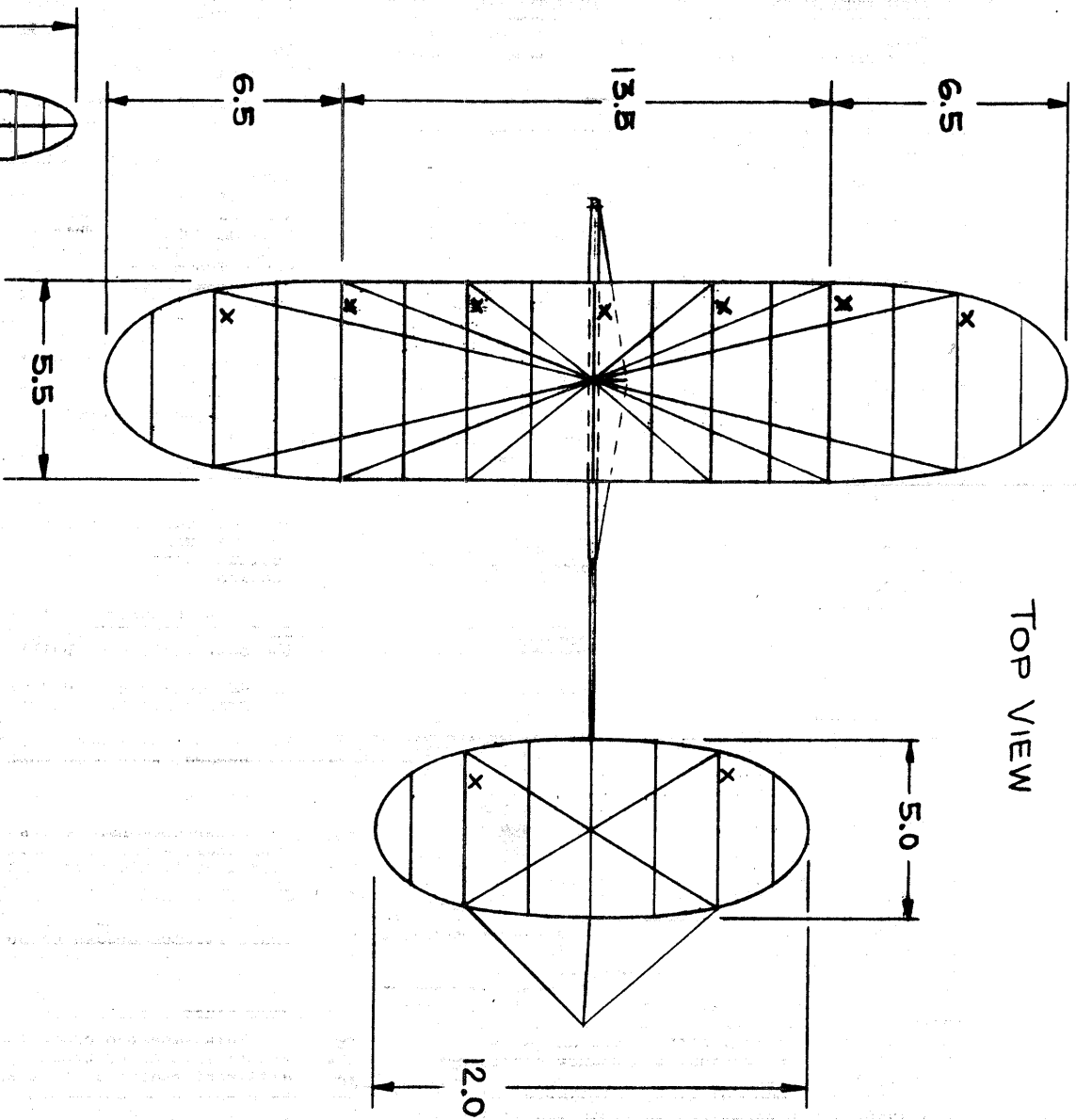


#### CONTEST RESULTS

OAKLAND CLOUD DUSTERS Cat. II Contest (Cow Palace) 96' ceiling.

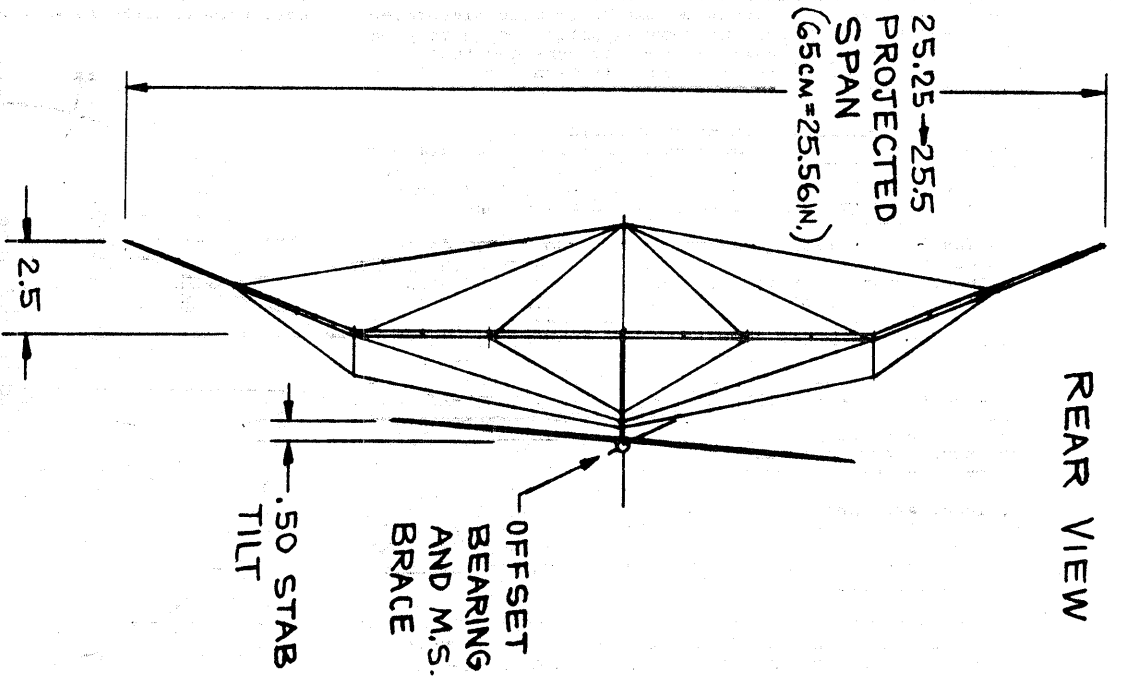
Jr-Sr. HLG	Open HLG		
1. Marty Thomson	1:59.2	1. Steve Geraghty	1:39.6
2. Bill Gibbs	1:35.4	2. Dick Schenz	1:33.0
3. Gerry Geraghty	1:20.2	3. George Foster	1:15.0



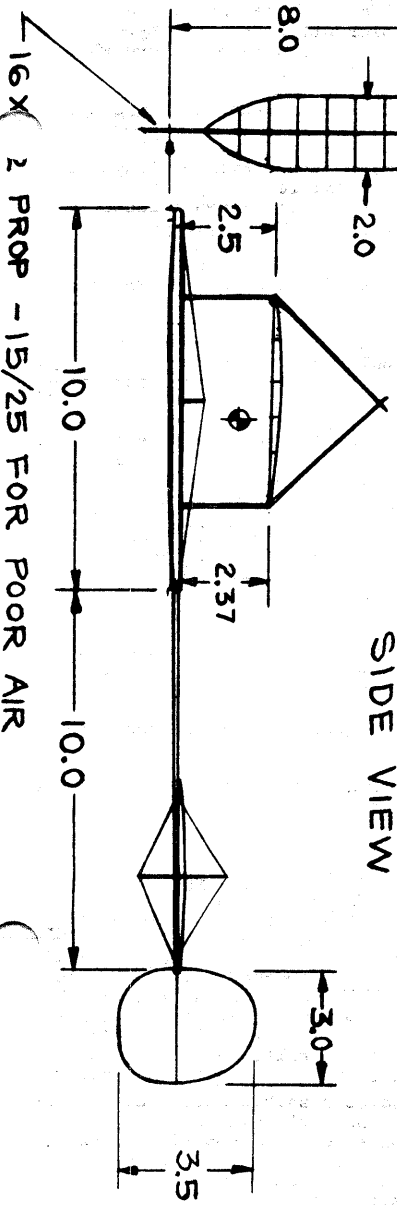


TOP VIEW

SIDE VIEW



REAR VIEW



16X 2 PROP - 15/25 FOR POOR AIR

**SNARK MK II**

65 CM FAI

18:17.8 CAT I AMA FAI  
 RECORD - MAY 1969  
 18:48 FAI CAT I AND  
 19:43.5 AMA CAT I  
 FAI RECORDS, OCT 1969

<u>Jr-Sr Paper Stick</u>	
1. Gerry Geraghty	9:22
2. Terry Buddingh	8:40
3. Chris Miller	4:36

<u>Open Paper Stick</u>	
1. Jim Richmond	20:20
2. Bob Randolph	18:01
3. Jerry Powell	16:08

<u>Jr-Sr Indoor Stick</u>	
1. Bill Gibbs	16:55
2. Linda Randolph	12:57
3. Terry Buddingh	9:40

<u>Open Indoor Stick</u>	
1. Carl Rambo	29:49
2. Jim Richmond	25:01
3. Bud Romak	24:48

<u>Jr-Sr Cabin</u>	
1. Bill Gibbs	8:44
2. Gerry Geraghty	1:47

<u>Open Cabin</u>	
1. Bob Randolph	18:06
2. Jim Richmond	13:56
3. Bob Gibbs	11:52

<u>FAI - Jr-Sr-Open</u>	
1. Jim Richmond	34:57
2. Bud Romak	
3. Clarence Mather	

22:00	56:57
	47:53
	42:30

BOEING HAWKS Cat. II Contest (Interlake High School) 37' ceiling.  
December 19, 1969

<u>Jr HLG</u>	
1. Phil Hainer, Jr.	1:01.3
2. Jim Hainer	:48.7
3. Spencer Nelson	:31.1

<u>Sr-Open HLG</u>	
1. Jim Walters	1:12.1
2. Al Borer	1:08.4
3. Joe Deady	1:00.4

<u>Easy 3</u>	
1. Joe Deady	10:58
2. Jim Walters	9:54
3. Joe Portecorvo	8:24
4. Rich Sironen (Jr.)	3:81

<u>Indoor Scale</u>	
1. Al Borer	72.5 pts.
2. Woody Kokita	64.5
3. Norm Jacky	61.5

INDOOR CONSTRUCTION TECHNIQUES

Part I - Wood Selection

Most indoor builders, even beginners, know that wood selection is a major technique that must be learned before they can build ultra-light indoor models that will hold up under the rigors of ground handling. (Bill Bigge once did calculations to show that, once launched, an indoor model could be much lighter without collapsing than it must be to hold together during winding and launch.)

If we assume that our wood is of uniform thickness and uniform quality across the entire sheet, we can study the grain structure variations in order to make proper application of each sheet of wood. Before we go on to that, a word about our assumptions: Balsa is highly variable as it grows, depending upon outside factors. Thus, a small block of balsa may weigh (average) such that it would be graded as 4.5#/cubic ft; yet it might be 4.2# wood on one side of the block and 4.8# wood on the other. Both our balsa processors (MicroDyne and Micro-X) are conscientious in their wood grading, both before and after cutting. It is still possible for them to produce sheets not perfectly uniform, in that detection of minor variations would take a prohibitive amount of time. Similarly, minor variations in thickness are difficult to prevent during cutting and also hard to detect without taking 20 or more micrometer measurements. Even so, our wood supplies are quite good in both respects, especially when you consider that soft, thin balsa must be sawed to size. It cannot be sanded by machine without warping.

Basic wood grading by grain structure gives four distinct grades of wood: "A" grain, "B" grain, "C" grain and quarter grain. Quarter grain wood is really extra high grade C grain, as will be seen in a moment; pure forms of A grain and B grain are more distinct gradations.

The illustration below, "The Balsa Compass," is an attempt to show the relative relationships of each type of grain structure. It is supposed to show the end view of a balsa log, with a block outlined just above the center of the log. Certain portions of the block have been cut into sheets, viewed from the end, and the block has been divided into zones according to grain types. Herein lies the difficulty, because the "C" shown on the ends is not true C grain. Pure C grain, also called quarter-grain, is cut so the sheet is parallel to the annular rings of the log. This produces very large speckles in the surface appearance, where the saw has cut across individual rings. A grain is just the opposite; the sheet is cut perpendicular to the annular rings. This produces the appearance of long, straight lines the length of the sheet. B grain sheets, viewed from the end, would have the rings running through the sheet at an angle, as illustrated. "B" wood has a mottled, unattractive appearance, but is actually an excellent choice for several purposes.

The descriptions given above for the various types of wood grain are a bit difficult to keep track of, unless a sample of each type is available for comparison. It is easier to study wood grain types if you have samples of 1/4" sheet with various grain types. Cut smoothly across the end of each piece with a razor blade so the annular

rings are visible. Compare the grain directions to those illustrated in the "compass" as an added study aid. Finally, there are some good color slides of wood types in the Dick Black "wood selection" slide/tape lecture which will aid in learning wood grain types.

The following comments are taken from the Micro-X catalog, with their permission:

**A Grain:** very easy to bend across the grain or lengthwise. Actually the weakest or most flexible wood per weight. It is best used for spars where sharp bends are necessary like wing tips, struts, rudders and prop outlines. Not for rolling bodies. (This is because much of the strength of a motor stick depends upon keeping the cross-section round and uniformly curved. Stiff wood, like quarter-grain, is sufficiently stiff.)

**B Grain:** Sometimes unattractive looking but a very stiff wood for its weight. It should be used for straight spars such as wing center sections. Can also be used for ribs and prop outlines.

**C Grain (Quarter grain):** Looks like mother-of-pearl chips running crosswise in it. It is very stiff, both across grain and lengthwise. It is best used for rolling motor sticks, and is excellent for ribs. Do not use for spars.

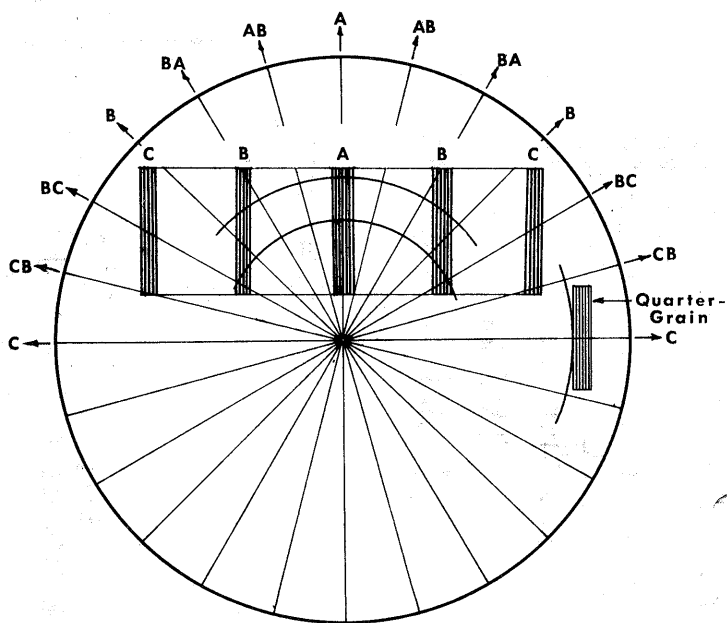
Regular "C" (shown as CB on the compass) is almost as good as quarter grain for the uses mentioned above. If you must make a choice, save quarter grain for motor stick rolling, since this is the most critical application in the whole model.

Lest the extra designations on the compass cause some confusion, the following groupings can be made by all but the most finicky of builders:

1. CB & C - use as C grain; except reserve C (quarter-grain) for motor tubes.
2. BC, B & BA - use as B grain where very stiff spars are needed, with B in most critical places.
3. AB & A - Use as A grain.

After wood has been sorted into grain types and uses, each sheet should be checked for stretch breaks and uniform density along the entire length (no soft places in the sheet). Stretch breaks are caused when a log falls across another log, causing the whole log to bend sharply at one place. The result is tiny cracks in a sheet, and small stretch breaks cannot be seen. They show up in this test: cut a piece with uniform cross-section, as nearly square as possible. Hold the ends of the strip; bend it in a curve approximating a semi-circle. Stretch breaks will cause the strip to fail, usually with a clean break.

This same procedure locates possible soft spots in the sheet; instead of breaking, the strip will bend with a different radius at soft spots (or hard spots). Often, it is possible to salvage most of a sheet if the change in density or strength occurs at one end - just trim off the soft part or mark it with marker pen.



The Balsa Compass

# INDOOR

## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

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

### New Members!

THEODORE KATSANIA, 48 Whitehall Dr., Berea, O. 44107  
 KEN KRAEMER, 3945 N. 41st St., Milwaukee, Wis. 53216  
 EUGENE C. LARR, 2906 Lone Jack Rd., Encinitas, Cal. 92024  
 BASIL TURI, 38015 Vine St., Willoughby, O. 44094

### NIMAS Members Honored

As is their custom, the Chicago Aeronuts held their annual awards banquet in January. This event is one of the outstanding "social" activities held by the Aeronuts, and seems like a good idea for more clubs to take up.

Jim Richmond received a "recognition award" plaque (donated by Pete Sotich) for 1968-69, for winning first at the 1968 Indoor World Championships, and for setting so many AMA records in the two year period. Jim also was given a special "60 minute" stopwatch by the Aeronuts - is this a way of suggesting that Jim should win at the 1970 World Champs with a 60 minute flight?

Charlie Sotich won the Raoul T. Hoffman High Point Trophy for 1968-69, by amassing the highest number of club points. Points are awarded by the Aeronuts for placing at contests, working at contests and performing other club membership functions.

### Peanut Scale Rules

The following rules, drawn up by the Bridgeport Flying Aces Club and furnished by Bill Hannan, are offered in response to a question raised recently. Any questions on these rules should be cleared up by contacting Cpt. Dave Stott, Flying Aces Club General Headquarters, 66 Bankside Street, Bridgeport, Conn. 06606.

1. Open to any scale model of no more than 13" wingspan.
2. Total of three flights, hand launched, to be used in addition to Construction and Workmanship points, to determine winner. Flyoff to break ties.
3. Unlimited attempts to gain three official flights. Any flight of 5 seconds or more is automatically official.
4. Construction points - General
  - A. Use of condenser paper instead of Jap tissue - minus 10
  - B. No microfilm allowed.
  - Flight Surfaces
    - A. All or partial sheet - minus 5
    - B. Built up, tissue covered, top or bottom only - minus 5
    - C. If proof can be shown that the real ship was covered one side only and model is so - zero
    - D. Built up with top & bottom covered - plus 3

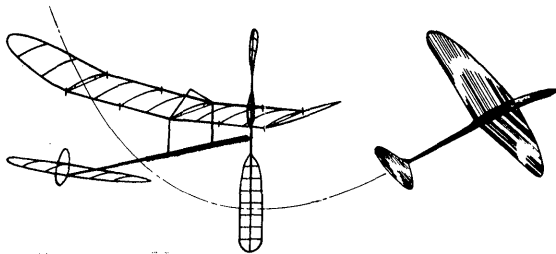
### Workmanship points

- A. Color - reasonable effort to use tissue and/or dope to simulate realistic coloring for type modeled - plus 3
- B. Marking - Civil registration & striping or military insignia, serial numbers, squadron markings - plus 3
- C. Details - Struts, cowls, cylinders, pilot, rigging, armament, windshields, steps and control surface outlines plus any unmentioned outstanding details for the type modeled shall be scored thus:
  1. Stark minus 3
  2. Lax zero
  3. Good plus 3
  4. Great! plus 6
- D. Planes that had retractible landing gear may be built with the gear represented in the up position.

### CONTEST CALENDAR

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ARIZONA - Phoenix. Indoor sessions in Arcadia High School Gym, 7 pm to 10 pm, the second Tuesday each month. Contact



Terry Thorkildsen, 3103 W. Willow Ave., Phoenix, Arizona, 85029 for further details. Cat. I site.

CALIFORNIA - Edwards AFB. Cat. II Record Trials scheduled for Feb. 15 and Mar. 15, 1970 at Edwards AFB. Contact Bob Randolph, 25145 Lawton Ave., Loma Linda, Cal. 92354 for details and possible need for clearance.

ILLINOIS - Chicago. Cat. I contest by Chicago Aeronuts, Feb. 15, 1970; 9 am to 4 pm, Forest View High School Gym, Arlington Heights, Ill. HLG & Pennyplane event (rules in this issue); Juniors - 15 and under; Open - 16 and over. Pete Sotich, 3851 West 62nd Place, Chicago, Ill. 60629 ph. 312-RE 5-1353 after 6 pm. Also: Flying sessions each Sunday through Mar. 29, 1970. Call Al Sortwell at 312-439-1497 for directions to site.

INDIANA - West Lafayette. Purdue Aeromodelers Indoor Contest, Old Purdue Fieldhouse in W. Lafayette. Easy B, HLG, Indoor Scale; all ages combined. Trophies through 3rd in each event. Chris Matsuido, Box 617, Cary Hall, W. Lafayette, Ind. 47906, ph. 495-2867. Mar. 8, 1970, 9 am-4 pm.

KANSAS - Olathe. Indoor contest, Olathe Jr. High, 1 pm to 5 pm, Feb. 21, 1970. AMA Cub, Sub-Jr. (all ages thru 13). HLG - Sub. Jr.; Ages 14 & over; Indoor Scale - Jr. & Open; Easy B - all ages combined. Harry Cook, 6319 Marty, Overland Park, Kan. 913-HE 2-5523 or Roger Schroeder, 4111 W. 98th St., Overland Park, Kan. 913-648-4265.

MARYLAND - Silver Spring. Indoor session at JFK High School, 1901 Randolph Rd., Silver Spring. Feb. 20, 1970, 7 pm to 11 pm.

MASSACHUSETTS - M.I.T. Cat. II indoor session at MIT Armory, Mass. Ave. & Vassar St., Cambridge, Mass., 3:30 pm to 6:30 pm, Mar. 7, 1970. Indoor contest April 11, 1970, 1:30 pm to 8:30 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass., ph. 358-4013.

MISSOURI - St. Louis Area. Indoor contests at Duchesne High School, St. Charles, Mo., Mar. 15 and Mar. 22, 1970, 11 am to 4 pm. Indoor Scale, Delta Dart, Easy B, Indoor Stick, HLG. Special rules for Open Delta Dart, Scale, Easy B; contact Jim Bennett, 324 Helfenstein, Webster Groves, Mo. 63119 or Lou Merlotti, 9214 Mackinac, Affton, Mo. 63123 for rules and entry blank.

NEW YORK - Long Island. Cat. II indoor contest at Cantigue Park, Hicksville, L. I. May 3, 1970. Site is 190' dia. dome, 50' high. HLG, Easy B, Indoor Stick, Paper Stick, Scale. CD - Bill Dunwoody, 985 Ft. Salonga Rd., Northport, L.I., N. Y.

OHIO - Wright-Patterson AFB. Indoor meet on Mar. 8, 1970, AMA Delta Dart, AMA Scale and Peanut Scale. Marty Richardson, 7130 Claybeck Dr., Dayton, O. 45424.

TEXAS - Ft. Worth/Dallas/Denton. The Jan. 17 meet had to be cancelled at the last minute; will be re-scheduled when possible. If you did not receive a notice in January and want to receive notice when the meet is rescheduled, send your name to Box 545, Richardson, Tex. 75080.

WISCONSIN - Milwaukee. Indoor sessions each Thursday from 7:30 pm to 9:30 pm at Sherman Social Center, North 51st St. and W. Locust St. Ken Kraemer, 3945 N. 41st St., Milwaukee, Wisc. 53216, ph. 414-442-5864.

### TOP TEN EASY B

	Time/ceiling	Fudge (to 35')	Score
1. Bob Platt	575/20'	1.32	760
2. Dick Hardcastle	602/23'	1.23	743
3. Hal Crane	525/20'	1.32	692
4. Jim Walters	675/37'	.972	656
5. Clarence Mather	590/30'	1.08	637
6. Joe Portecorvo	516/24'	1.21	623
7. Joe Deady	636/37'	.972	618
8. Pete Patterson	492/24'	1.21	594
9. Jim Clem	417/22.3'	1.25	520.6
10. Harry Cook	319/15'	1.52	485

Top Juniors				
1. Richard Sironen	517/37'	.972	503	
2. David Sandelius	460/37'	.972	447	
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4. Jimmy Clem	254/22'	1.25	318	
5. Kim Mather	255/25'	1.18	302	
6. Neal Rozelle	287/35'	1.00	287	
7. Paul Brown	222/22.3'	1.25	277	

#### TOP TEN CEILING DODGERS

	Time/ceiling	Fudge (to 35'	Est. Altitude	Score
1. Tom Vallee	810/20'	1.32	19'	1068.2
2. Hal Crane	682/20'	1.32	19'	850.2
3. Dick Hardcastle	602/23'	1.23	22.5'	743
4. Hewitt Phillips	428/20'	1.32	7'	564.9
5. Richard Sironen	408/37'	.972	33'	396.6
6. Roger Schroeder	239.5/15'	1.53	13.5'	365.9

#### THE 1970 FAI INDOOR TEAM SELECTION PROGRAM

by Clarence Mather

Many modelers are interested in the program and support it in various ways. Some actively seek a team position, others enter area trials with no intention of going to the Finals, and others assist at contests. Each one makes an important contribution and this report is meant to provide details on how a program develops.

The team is selected during the year preceding the World Championship to allow the team some months of preparation, so the program to select the 1970 Team began Jan. 1, 1969. By August, 1968, AMA had taken no action, so Bud Tenny and Bob Champine got the program under way. The program administrator is not allowed to fly in area trials so Bud and Bob looked for someone to fill that role. I volunteered because someone was needed and I felt that the 1968 team experience would be helpful. Also, I felt that those of us who had benefitted so much from others' work should "take a turn".

By October, 1968, the program format and schedule were generally set up. Usually the Administrator decides on type of program, dates and locations. For his assistance there are Area Coordinators; Joe Bilgri, Bob Champine, Dick Ganslen and Jim Richmond served in 1968; I added Bud Tenny to form a committee of six.

In November, 1968, the first memo went out suggesting goals for the program and giving some views on the Finals. Committee members and a number of other indoor fliers responded with their opinions, so very quickly I had a good idea of the general feelings on the program.

The time for the Finals was easily decided since nearly everyone favored Nats time so both events could be entered during one vacation period. The Finals site was a much bigger problem. Ideally, the site should approximate the World Champs site, be centrally located, and be available at the proper time. Preliminary reports indicated Poland would host the 1970 World Champs in a large hall, but this site was too drafty and another site was selected later.

In March Dick Ganslen reported that Will Rogers Coliseum in Ft. Worth, Texas, could be obtained for the Finals. That was good news because the Coliseum is a good medium-height, centrally located site. Some fliers suggested holding the Finals at Lakehurst since the Polish hall was very high and many of the participants planned to attend the Nats anyhow. I contacted AMA to see if Lakehurst was available was advised it was not, unless the Finals were flown during the Nats or at night following Nats events.

In April it was announced that the World Champs would be held in a Romanian salt mine. I then recommended that the Finals be held at Lakehurst. AMA and some of the committee felt that the qualifiers should be polled because Lakehurst was not a central site. This was a good idea, except that time was getting short. The poll was undertaken, with twenty-five favoring Lakehurst, seventeen choosing Ft. Worth and six picking West Baden, Indiana, site of the 1968 Team Finals. There were strong comments in favor of each site, as could be expected. Surprisingly, West Baden was mentioned as a central site, even though it is far from central U.S. and most Western fliers prefer the small additional travel to have the use of Lakehurst. However, each opinion was the voice of a serious indoor flier and received careful consideration.

Finally AMA approved Lakehurst and the committee members were notified in a May 12 memo. We then expected to hold the Finals in the evenings after the Nats events, but Julius Rudy notified me that the eastern fliers were able to use a different hangar on Sundays and that we might be able to do the same. This was good news, because the night time visibility in the hangars was reported to be marginal. I decided to try for a Sunday, as the advantage

of having a hangar to ourselves for a full day seemed to be worth the possible inconvenience of late notification of the finalists - especially since just one day was involved. Through the efforts of Chester Wrzos and C. V. Russo permission was received to use the hangar, and Chester volunteered to CD the Finals - much to my relief! He did an excellent job and deserves many thanks.

In general I felt the program went well and I would not reverse any of the major decisions if it was to be done over. The total number of entrants was down, and I doubt there was any one reason. There seems to be more indoor flying than ever around the country; hopefully more of these fliers will try FAI. The 65 cm model is easy to build, transport and fly in small sites. Some suggested the lack of high sites caused the decline in entries, but San Francisco and Chicago had good sites regularly available and had only a handful of entries.

There were a few suggested changes for the program. A couple of fliers recommended eliminating the Quarter-Finals; but I believe the extra step gets fliers out and improves the quality of the flying. If fliers are staying out because of too many steps perhaps they should be reduced. One group recommended having no area flying at all - just a one-shot team selection contest. I feel this is a bad move that would lower flying quality, reduce local flying and reduce the number of entries. Another recommendation was to keep the program as is except to advance all quarter-finalists who make 80% of the top time at their Quarter-Finals.

Now is the time to suggest changes in the program and present them to INAV so they can be thought over and acted upon by a large number of fliers. Also, now is the time to think about who will be the next program administrator and area coordinators.

#### STATE OF THE ART

This month's feature model is John Triolo's record autogyro; it held the record just prior to Fred Weitzel's 8:27 (set at Lakehurst June 11, 1967). The model is also noted for the minor furor it caused - John had to write a brief justifying the design and the FFCB upheld his interpretation of the rules (regarding the distribution of wing and rotor area vs. stab area). Ironically enough, the record was set with the model wound somewhat less than full turns; a handling accident prevented another flight.

#### POSSIBLE NEW EVENT?

The Jan. '70 INAV reported a proposal to create a new model class intended to help introduce indoor flying to beginners. The suggested features were: FAI span, a minimum weight equal to a U. S. nickle (approx. .2 oz.), and rubber weight limited to half the airframe weight.

Tom Vallee opposed the event and said that Easy B can be changed to allow wood braces which make a maximum angle of 45° to the wing posts, and that if a minimum weight is used it should be .05 oz. He also opposed restriction of rubber weight. I countered that present Easy B rules do not prohibit bracing; we are discussing the rest.

Hal Crane suggested that the maximum weight is a bit too high, that perhaps .1 oz. (approx. a penny) would be adequate. Frank Ehling approved the minimum weight concept, with the notation that the event should result in a model that can be built to a minimum weight using outdoor supplies. He also proposed a standard motor and fixed prop diameter and pitch. The last two suggestions would be too difficult to check during processing, but one of "our" problems is local availability of indoor materials. Frank's last point is also valid - entrants in "beginner" events should not enter more advanced events.

To expand on Ehling's ideas a bit, outdoor wood comes in certain fixed sizes, regardless of the wood density. The beginner class should then be such that a model built with outdoor wood, and using wood sizes compatible with beginner skills would "come in" about the specified weight or just over. Rubber limits may or may not be acceptable, but I feel a limit of half the specified airframe weight would help prevent high speed, hard-to-trim models.

In regard to using the Easy B event, two difficulties arise: using outdoor wood and beginner-skill wood sizes, the Tenny Easy B (Oct. '67 AM) weighed exactly .08 oz. It was a "lead sled" (thanks to Jim Clem for the name!) and definitely suffered in the performance department. If the model had been .2 oz. and FAI size, the wing loading would have been about the same and performance would have been much better, even with rubber weight limits.

Meanwhile, the Chicago Aeronuts are trying a minimum weight event at their Feb. contest (see Contest Calendar). It is called the Pennyplane event and the rules are:

1. Model must weight as much as a new copper penny.
2. Must not exceed 18" in length (including propeller) or wing span.



3. Motor stick must not exceed 10" in length (from front of thrust bearing to rear hook).
4. Single rubber motor and propeller (no gears).
5. Motor must not be enclosed in body or motor stick.
6. Model must be weighed prior to each official flight.
7. (Comments on scale design; omitted to save space).
8. Five official flights are allowed. Highest single flight is used to score.
9. Timing stops when model touches any object, except in case of mid-air collision with another model. Both contestants may then elect to take the flight over or accept the time as of the impact. (This rule may be modified according to local conditions.)
10. Any type of covering material or construction may be used. Configuration (number of wings, pusher, low wing, etc.) is the free choice of the builder.

### INDOOR CONSTRUCTION TECHNIQUES

#### Accuracy Is Our Policy

And we sometimes achieve it - but not last month! At least five people wrote in to point out that the position of "A" grain and "C" grain cuts were reversed in the illustration "Balsa Compass". This change affects also the comments in paragraph #4; substitute "A" for "C" in that paragraph.

In addition to the well documented comments which told me how I had goofed, Bill Bigge offered these comments:

"Once upon a time - about twenty years ago - I believed I could see annular rings in sheet balsa, and for a time made the mistake of identifying the speckles in quarter-grain balsa with the annular rings. As you have probably been informed by now, the grain directions in the drawing "The Balsa Compass" are in error by 90 degrees. The speckles are medullary rays - in effect plates of denser cells that grow in a radial direction. When you consider that the tree is at most ten years old, you see that there cannot be many annular rings to be seen. A hard streak running the length of a sheet is part of an annular ring.

Of two sheets of wood the same density and quality, the quarter-grain sheet is stiffer both across the grain and lengthwise. I infer that it has less resistance to crushing in the direction of the thickness of the sheet than a tangent-cut sheet. ("B" grain - Ed.) Probably the crossgrain tensile and shear strength is greater in the radial than in the circumferential direction. But whereas the crossgrain stiffness may be several times as great for quarter-grain, the lengthwise stiffness is about 3% to 6% greater for a square spar loaded in the circumferential direction than for the same spar loaded in the radial direction. Comparison between different sheets would be meaningless for detecting this effect - sheets that are otherwise indistinguishable may differ by more than 20% in stiffness. (Ed. Note - this is why wood density and spar dimension notes on indoor plans are relatively meaningless to anyone except the man who made them - he is the only one who has that particular sheet of wood!) I have just finished testing a 6.5# 3/8 x 3/8 and a 5# .042 x .044, to get the above numbers. The difference is noticeable when sanding a round prop spar to get uniform stiffness in all directions - it needs to be out of round. No, I don't locate wing posts to get quarter-grain on the sides - never thought of it!"

That should clear up last month's goofs - let's start with a clean slate this month!

#### Part II - Wood Density

Balsa wood density varies from less than four pounds/cubic foot to over sixteen pounds/cubic foot. Indoor modelers use the entire range up to 6.5 #/cu. ft., with wide divergence of opinions regarding which density should be used for any given purpose. Much of the difference in opinion is caused by the wide variations in quality among sheets of a given density - as reflected in Bigge's statement on stiffness above. In general, it is possible to compute "equivalent" spar cross sections to be cut from sheets of different density, if you ignore the variations in the wood.

For example, suppose you had two pieces of "B" stock for wing spars - one of 4.5# density and one of 6.5# density. Your past experience tells you that .022" x .030" spars from the 6.5# wood are adequate for your level of handling experience. What size should spars from the 4.5# wood be? Multiply width x depth x density for the known spar (22 x 30 x 6.5 = 4300) and divide by the density of the other sheet (4300/4.5 = 950). By trial we find that a spar .026" x .037" gives an equivalent cross section (26 x 37 = 950), so this can be considered an "equivalent" spar. However, there will be differences! The following comparisons are valid in the general sense: The 4.5# spar will be much stiffer; enough so that the cross section can be reduced considerably if the model never has to rafter-

bang or be steered, and if your handling skill is enough to avoid collapsing parts as you handle it.

The 4.5# spar will be brittle (a very occasional sheet of light wood will not be brittle), so that flight or handling damage will result in complete spar collapse. The 6.5# spar may fall, but it is far more likely to break without a clean fracture. This leaves a few wood fibers to bridge the break and make repairs easier. However, the 6.5# spar will usually deflect much farther before breaking; thus it is a better choice for models which must take repeated abuse.

The motor stick is a different case. The stick must be as stiff as possible, since any deflection under full winds only increases the "leverage" the motor has, which in turn further loads the stick. Thus, the very stiffest wood must be chosen, and the density must be as low as possible, consistent with high quality. In general, the stiffness of the stick increases in proportion to the diameter of the tube. For a given length and wood density, the stick weight increases in proportion to the diameter. Thus, the stick blank must be as thin as possible to give a large diameter, lightweight stick. With the extremely thin wall, it is easy to see why stiff wood must be used. Stiffer wood holds the circular cross section and retains the stiffness. Later, it will be shown how to further increase the stiffness with internal braces.

Ribs are another case where stiff, light wood must be used. With wide chords prevalent in current FAI practice, the ribs become miniature "spars" which simply must be stiff to hold their shape - essentially no bracing is possible except for compression ribs.

Moisture absorption is another factor in choice of wood, and the remarks to follow may leave me out on a limb for someone to saw off! I believe that low density wood absorbs more moisture per unit volume. Since larger cross sections must be used for "equivalent" spars, it is likely that models built from low density wood will gain more weight in high humidity than models built from higher density wood. Thus it may be advisable to build models with small cross section spars from higher density wood if they will be exposed to high humidity.

Very little wood we buy is graded for density, and each builder should grade his own when he begins to get serious about light weight models. The formula for density, furnished by Dan Domina is:

$$\text{Density (\#/cu. ft.)} = \frac{\text{Weight in oz.} \times 108}{\text{length} \times \text{width} \times \text{thickness}}$$

Dan programmed a computer to calculate the weight of wood sheets of different densities, using the above formula. A sample of the data thus created is shown below:

#/cu.ft.	Oz.	#/cu.ft.	Oz.	#/cu.ft.	Oz.
<u>18" x .010" x 1.1875" (Sheet Size)</u>					
3.6	.0071	3.8	.0073	4.0	.0079
4.2	.0083	4.4	.0087	4.6	.0091
4.8	.0095	5.0	.0099	5.2	.0103
<u>18" x .0156 x 1.1875</u>					
3.6	.0111	3.8	.0117	4.0	.0124
4.2	.0130	4.4	.0136	4.6	.0142
4.8	.0148	5.0	.0155	5.2	.0161
<u>18" x .020 x 1.1875</u>					
3.6	.0142	3.8	.0150	4.0	.0158
4.2	.0166	4.4	.0174	4.6	.0182
4.8	.0190	5.0	.0198	5.2	.0206
<u>18" x .0313 x 1.1875</u>					
4.2	.0254	4.4	.0273	4.6	.0285
4.8	.0297	5.0	.0310	5.2	.0322
5.4	.0335	5.6	.0347	5.8	.0359
<u>18" x .125" x 3.0"</u>					
3.6	.2250	3.8	.2375	4.0	.2500
4.2	.2625	4.4	.2750	4.6	.2875
4.8	.3000	5.0	.3125	5.2	.3250
<u>18" x .250" x 3.0"</u>					
3.6	.4500	3.8	.4750	4.0	.5000
4.2	.5250	4.4	.5500	4.6	.5750
4.8	.6000	5.0	.6250	5.2	.6500
<u>18" x .250" x 4.0"</u>					
3.6	.6000	3.8	.6333	4.0	.6667
4.2	.7000	4.4	.7333	4.6	.7667
4.8	.8000	5.0	.8333	5.2	.8667



# INDOOR

## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

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

### New Members!

WALTER GODLESKI, 315 Walnut St., Homestead, Pa. 15120  
 IRVING HOPKINS, 859 Longmeadow St., Longmeadow, Mass. 01106  
 DENNIS M. JAECKS, 61 S. Ringold St., Janesville, Wis. 53545  
 DAVID SANDELIUS, 17204 Sylvester Rd., SW, Seattle, Wash. 98166

### Honorary Members

ALBERTO A. BARILARI, Castro 1169, Buenos Aires, Argentina

### Family Memberships

DIANNA L. DAVIDSON }  
 JAMIE L. DAVIDSON } 1815 Melbourne Ave., NE, Huntsville,  
 SUSAN L. DAVIDSON } Ala. 35801

### Change of Address

EDDIE CAPOGRECO, 1423 Andrews Dr., Cahokia, Ill. 62206

### Back Issues?

In years past there have been plenty of back issues, but the total number of copies in print dwindled as membership got closer to the number of copies printed each month. Recently, the number printed was increased to 400, which means that 18 months from now there will be lots of back issues available again. Meanwhile, there is a "loaner" set which is complete back to Dec. '61, if you have access to a copier. It costs about \$1 to mail and insure this package, and it is loaned on a first-come-first-served basis. If you want to copy these back issues, get your name on the waiting list!

### Correct it, Please

Last month, I goofed on the date in the masthead for the Feb. '70 issue. Hal Crane remarked that since I missed an issue last year, I must be making up for it by sending out two in one month! So, please scratch out Jan. and write Feb. at the top of the second Jan. '70 issue. That way, you won't panic sometime next year and decide you have two Jan. '70 issues and no Feb. '70!

### Lost Issues?

If you move, or miss an issue, please drop us a line immediately, so that the error can be corrected. Labels are typed with an original and two carbons, at the last minute, under a lot of pressure. Each "typo" is thus duplicated twice more; if one issue goes astray, the next two will also! We use first class postage so that most of the errors "bounce", but this usually results in about two weeks delay before you get the issue. If you know someone who just joined and missed the issue with his name in it, get him to notify me. The chances are that his file card has an error, and I can't tell where to send the issue after it comes back! Assume that you have been missed if you don't have the newsletter by the 20th of the month.

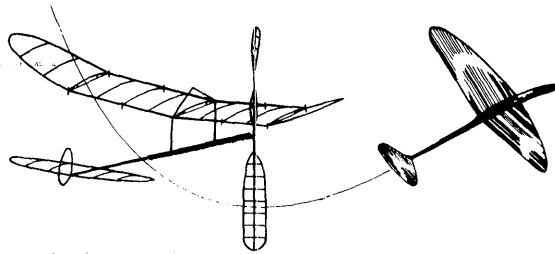
### Site Survey

Herman Adams, P. O. Box 491, Rome, Ga. 30161, is taking over the site survey since I wasn't getting it done. If you received a form and haven't sent it in, send it to Herman. If you haven't received a form, you should soon get one. Please fill it out and return it promptly.

### Certificate of Permanent Record?

Bob Meuser has proposed an idea which he would like to have comments on. Suppose that whenever a record is dropped from the record books due to a rules change, that the person holding that record be awarded a special "certificate of permanent record" to denote that his record stood until removed by legislative action. Does this seem to be a suitable and appropriate action?

If you buy that one, how about this: periodically drop all the records that have stood for some specific length of time, such as three years, and award the certificate mentioned above?



### CONTEST CALENDAR

ALABAMA - Huntsville. AA Indoor contest at Madison Co. Coliseum in Huntsville, Mar. 15, 1970. HLG - Jr & Open; Easy B - Jr.; Paper Stick, Indoor Stick & Scale - Open. CD - E. J. Minter. For info: J. T. Davidson, 1815 Melbourne Ave., NE, Huntsville, Ala. 35801, ph. 539-1509.

ARIZONA - Phoenix. Indoor sessions in Arcadia High School Gym, 7 pm to 10 pm, the second Tuesday each month. Contact Terry Thorkildsen, 3103 W. Willow Ave., Phoenix, Arizona, 85029 for further details. Cat. I site.

CALIFORNIA - Edwards AFB. Cat. II Record Trials scheduled for Feb. 15 and Mar. 15, 1970 at Edwards AFB. Contact Bob Randolph, 25145 Lawton Ave., Loma Linda, Cal. 92354 for details and possible need for clearance.

ILLINOIS - Chicago. Indoor sessions at Forest View High School Gym, Arlington Hts., Ill., each Sunday through Mar. 29, 1970. Call Al Sortwell at 312-439-1497 for directions to site.

INDIANA - West Lafayette. Purdue Aeromodelers Indoor Contest, Old Purdue Fieldhouse in W. Lafayette. Easy B, HLG, Indoor Scale; all ages combined. Trophies through 3rd in each event. Chris Matsuido, Box 617, Cary Hall, W. Lafayette, Ind. 47906, ph. 495-2667. Mar. 8, 1970, 9 am-4 pm.

MASSACHUSETTS - M.I.T. Cat. II indoor session at MIT Armory, Mass. Ave. & Vassar St., Cambridge, Mass., 3:30 pm to 6:30 pm, Mar. 7, 1970. Indoor contest April 11, 1970, 1:30 pm to 8:30 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass., ph. 358-4013.

MISSOURI - St. Louis Area. Indoor contests at Duchesne High School, St. Charles, Mo., Mar. 15 and Mar. 22, 1970, 11 am to 4 pm. Indoor Scale, Delta Dart, Easy B, Indoor Stick, HLG. Special rules for Open Delta Dart, Scale, Easy B; contact Jim Bennett, 324 Helfenstein, Webster Groves, Mo. 63119 or Lou Merlotti, 9214 Mackinan, Affton, Mo. 63123 for rules and entry blank.

NEW YORK - Long Island. Cat. II indoor contest at Cantaligue Park, Hicksville, L. I. May 3, 1970. Site is 190' dia. dome, 50' high. HLG, Easy B, Indoor Stick, Paper Stick, Scale. CD - Bill Dunwoody, 985 Ft. Salonga Rd., Northport, L.I., N. Y.

OHIO - Wright-Patterson AFB. Indoor meet on Mar. 8, 1970, AMA Delta Dart, AMA Scale and Peanut Scale. Marty Richardson, 7130 Claybeck Dr., Dayton, O. 45424.

TENNESSEE - Manchester. Cat. II indoor contest in Manchester Central High School Gym, Manchester, Tenn., 8 am to 5 pm, April 5, 1970. Easy B (Jr. only), Paper Stick, Microfilm, HLG, Scale. Contact Lee Webster, 1000 Sycamore, Manchester, Tenn. 37355 for more details.

WISCONSIN - Milwaukee. Indoor sessions each Thursday from 7:30 pm to 9:30 pm at Sherman Social Center, North 51st St. and W. Locust St. Ken Kraemer, 3945 N. 41st St., Milwaukee, Wisc. 53216, ph. 414-442-5864.

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**TOP TEN CEILING DODGERS**

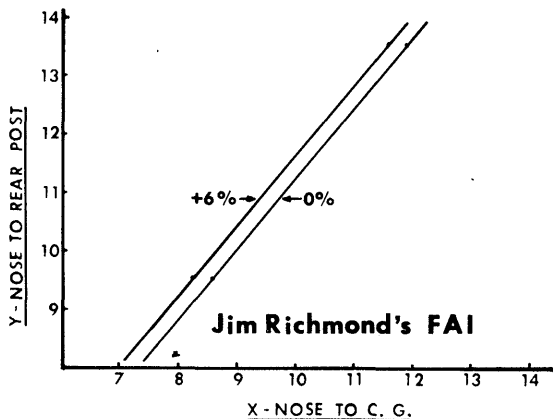
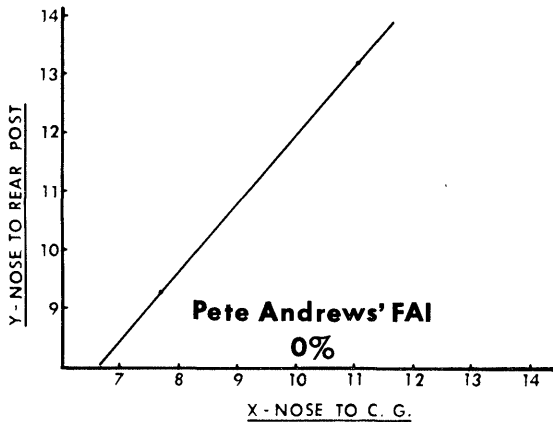
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**STATE OF THE ART**

This month we feature the top two models from the FAI Team Selection Finals, held at Lakehurst in July, 1969. The three-view is of Pete Andrews' second place model, and then there is a drawing below to show the moments of Jim Richmond's 41:45 model. The usual CMOS charts appear below also; both were computed at 0% stability margin. Jim flew his model at +6% margin, and Pete's model flew at very nearly 0%. Note the second balance line on the CMOS chart for Richmond's model, computed for +6%. (See the Nov. '68 INAV for a three-view of Richmond's model.)

Pete had the following comments about his model and flying strategy at the Finals: "The ship is a cut-down version of my 30 minute 'C' of 20 years ago and it seems to fly as well as my old ship. The prop as usual is 75% of the secret of high time. For the type of flying we were doing in Lakehurst, we needed a low pitch prop with high flare that would use up all the turns at a higher altitude than normal without overloading the plane with a heavy motor."

"In the eliminations I was using .042 pirelli (17" loop) and 1700 to 1800 turns for 34 to 35 minute flights. At the Finals my best plane was lost in the third round, and I used my remaining plane - badly warped surfaces and all - with .045 pirelli to fly rounds 4, 5 and 6."



**NIMAS POSTAL MEET**

The 5th Annual NIMAS Postal will be held during March and April, with entries to be postmarked by Apr. 30, 1970.

**Events:** Easy B, paper covered only, solid motor stick and boom, with unbraced surfaces.

HLG - AMA Rules except two ceiling classes - Class I - 18' to 25'; Class II - 25' to 35'

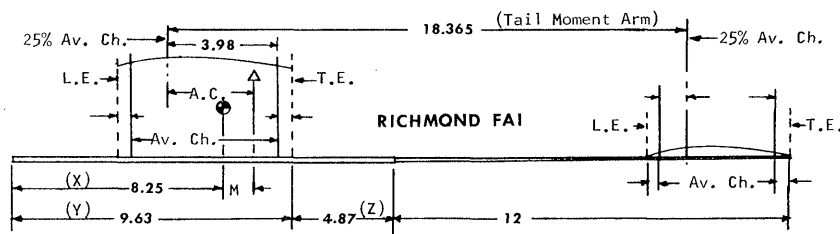
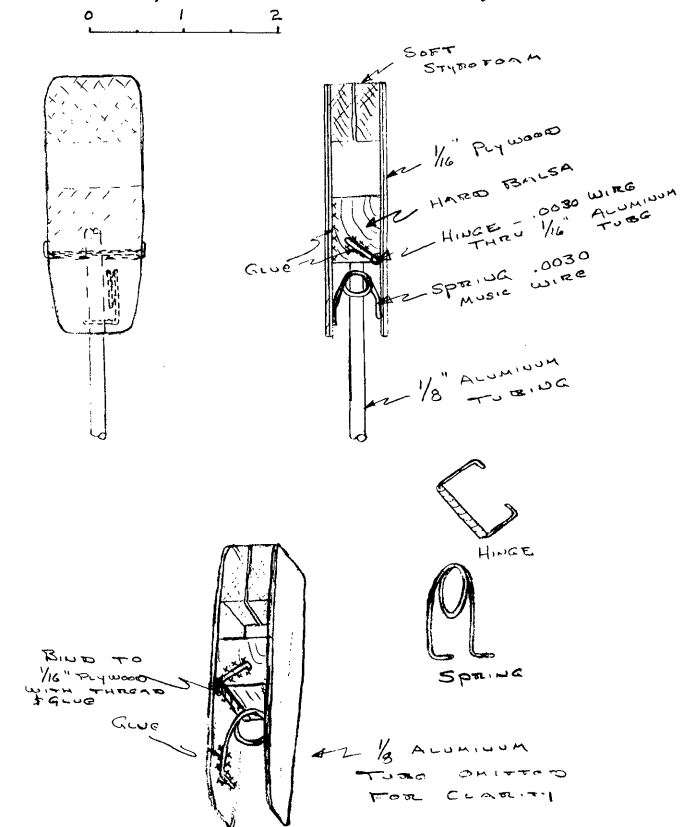
Indoor Stick - AMA Rules except use FAI ceiling measure to compute fudge factor.

**General Rules:** Entry fee 15¢ per event, stamps preferred. Separate events may be flown at different sessions, but all flights for a given event must be flown at one session. Please note ceiling height with each entry, as it will be used to figure fudge factors, using standard NIMAS fudge factors. Separate class for Juniors in all events, with awards for high placing Seniors. Separate class for Sub-Junior (age 12 and under) in HLG. Open entry to all, no need to be NIMAS member! Send entries to Bob Putman, 507 Darlene, Arlington, Tex. 76012.

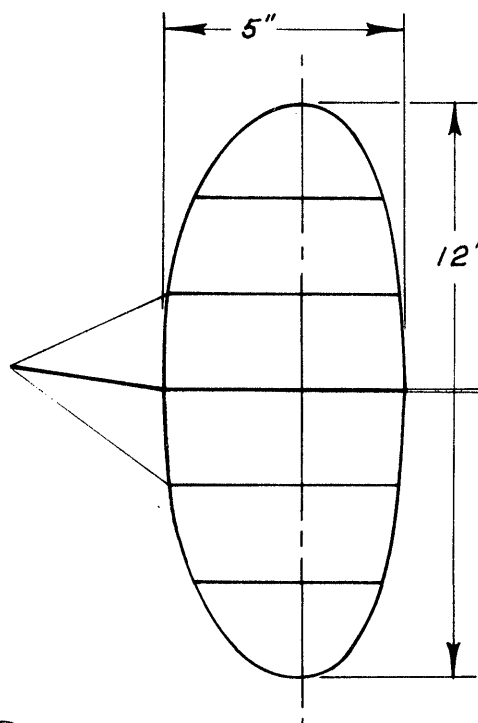
NOTE: Present Top Ten Easy B listing will be cancelled as of April 30, 1970, with Easy B winners from the Annual becoming the new Top Ten Easy B.

**HINTS AND KINKS**

One of the handiest accessories we use on the flying field is the run-down stand. Most of them just serve to hold the model between flights - and to let the motor unwind if we don't use an unwinding stoooge. The one shown below, designed and drawn by Bill Hulbert, is an extra-special run-down stand in that it holds the model firmly without crushing the fuselage. The drawing is mostly self-explanatory, except for the notation "soft styrofoam". The material Bill used is usually referred to as foam rubber, and is much softer than styrofoam.



PETE ANDREWS FAI PROP  
 17" X 29.5 PITCH 4/28/69  
 1.75:1 SPAR .06 X .09 RECT.  
 TAPER TO .03 X .03 SQ.  
 .045 PIRELLI OR 1/16 BROWN  
 1800 TURNS

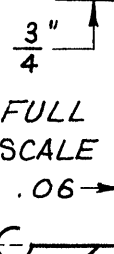
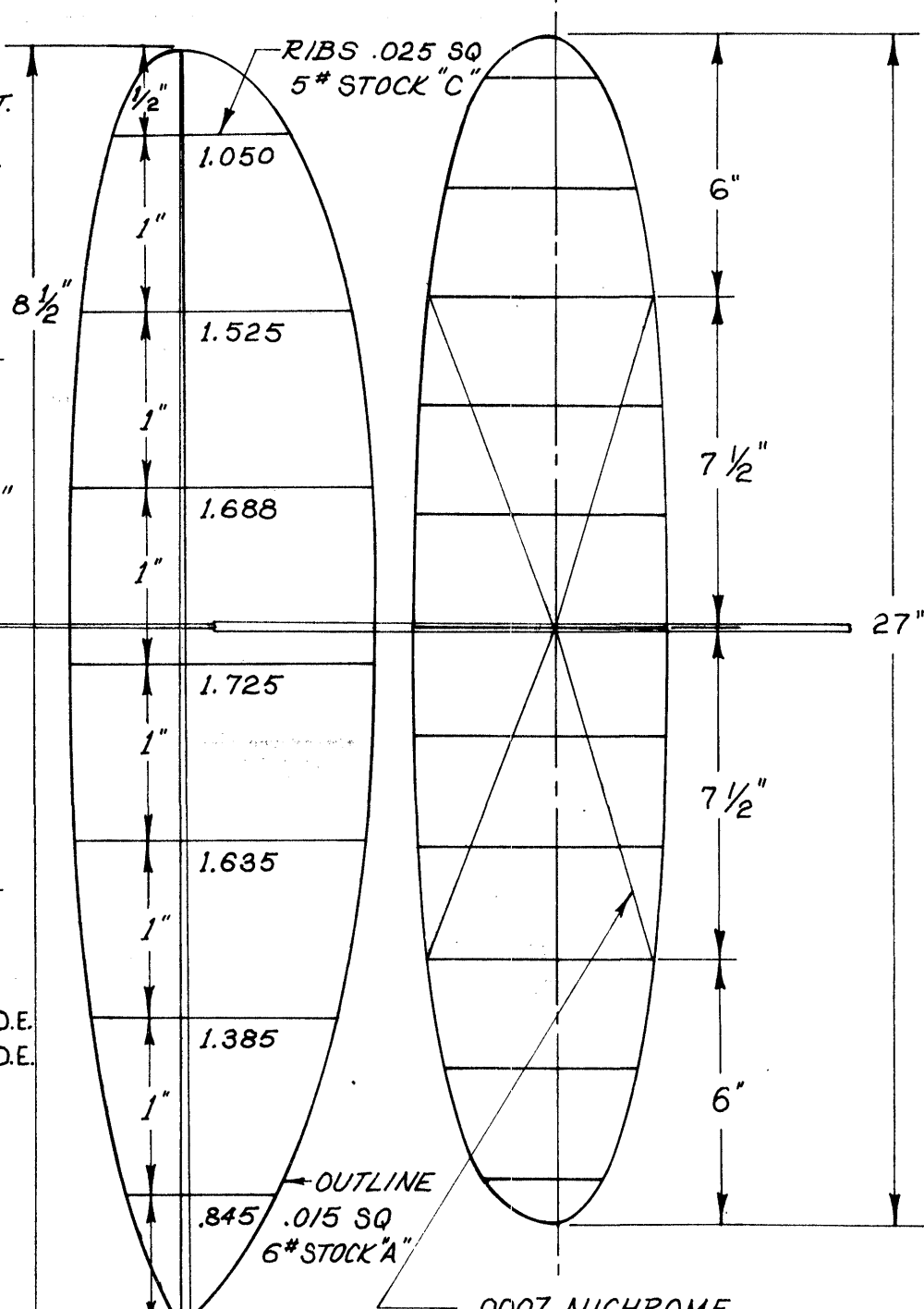


UNBRACED STAB

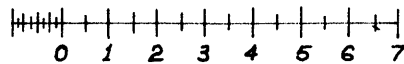
WING	.0082	1/3-2/3 D.E.
STAB	.0021	1/3-2/3 D.E.
RUDDER	.0003	
MOTORSTICK	.0070	
TAILBOOM	.0017	
PROP.	.0045	
TOTAL	.0238	

MOTOR 17" LOOP  
 .045 PIRELLI  
 1800 TURNS - 34+

AIRFOIL 5.5%  
 AT 40% CHORD

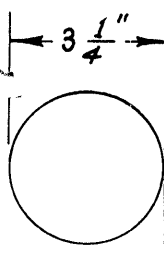
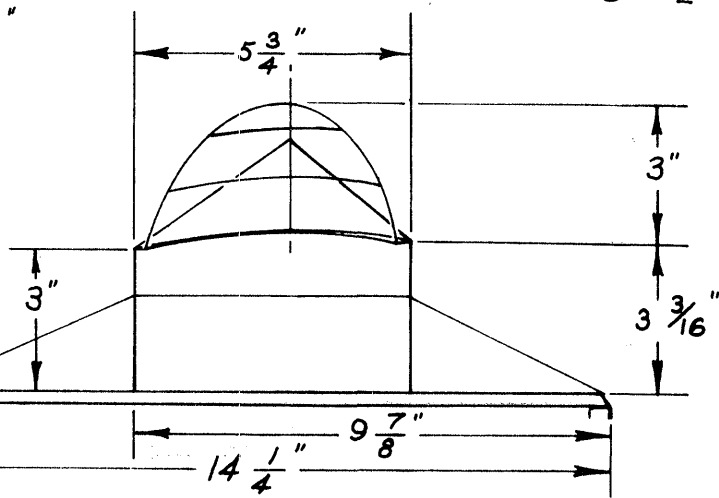


FULL SCALE  
 .06



.001 TUNGSTEN  
 SINGLE BRACE  
 REMOVABLE & ADJUST.

NOTE:  
 CONSTRUCTED ON BUILT UP JIG 2" X 3 5/8" X 8 1/2"



.0007 NICHROME  
 SINGLE BRACE T & B

OUTLINE  
 .845 .015 SQ  
 6# STOCK "A"

RIBS .025 SQ  
 5# STOCK "C"

OPTIMUM TUNE FOR LOW-CEILING FLIGHT

by Bob Meuser

When flying under a limited ceiling should you use a heavy motor partially wound? -- or a light motor fully wound? -- and should the model land just as the motor unwinds or should it land completely unwound?

When Hacklinger's paper, published in the Journal of The Royal Aeronautical Society, first came to my attention I became intrigued with the idea of extending his method of analysis to cover the limited-ceiling condition in order to answer those questions. Over the past winter, when I should have been building models, I did just that.

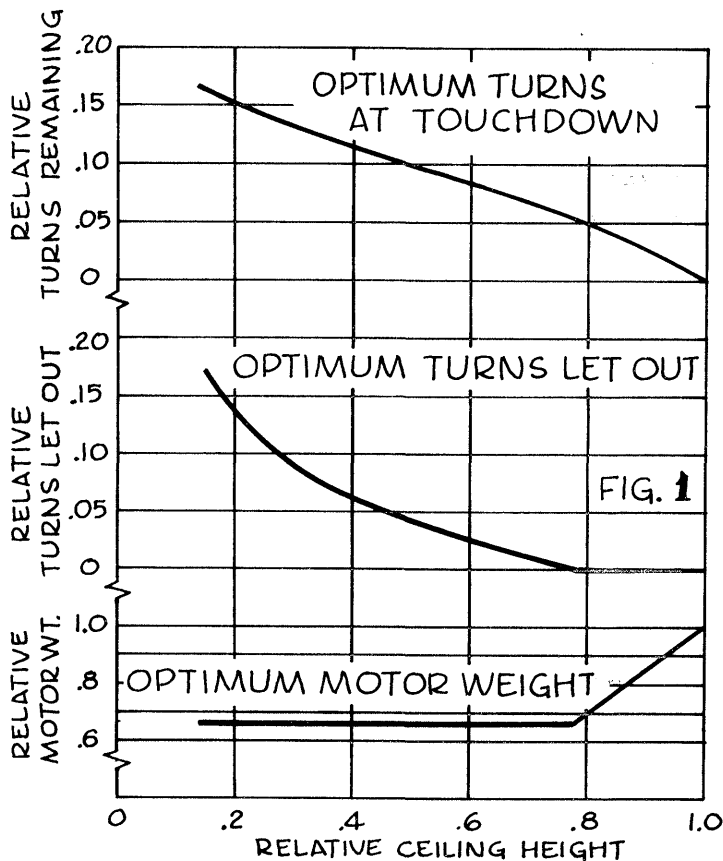
The graphs show the results, and here is how you would use them. First you decide, from experience, guesswork, measurement or a crystal ball, just how high your super Class D Stick would climb if it were set up to give maximum duration in a hall having an unlimited ceiling height -- say, 250 feet. You divide your ceiling height -- say 90 feet -- by that number getting  $250/90 = 0.36$ . This is your "relative ceiling height". Go to Fig. 1, find the 0.36 point along the bottom, and read the following three quantities from the curves:

Relative motor weight = 0.67  
 Relative turns let out = 0.07  
 Relative turns remaining = 0.12

This means that the motor should weigh about 67% as much as the one you would use in a hall having an unlimited ceiling, and the motor tube and prop could be a little lighter with the lighter motor. Then you should back off 7% of the turns from the fully wound motor, or only wind 93% of the maximum turns in the first place. Finally the model should be tuned to touch down with 12% of the maximum possible turns remaining in the motor (NOT 12% of the 93%).

Now all you have to do is work out the prop-motor combination that will accomplish all of that. That's your problem! The graphs show you what to do -- it is up to you to figure out how to do it.

How long will it fly? First you decide how long your model would fly when tuned for unlimited ceiling height -- say 50 minutes. (Dreamer!) Then from Fig. 2, again for a "relative ceiling height" of 0.36, you find a "relative duration" of 0.67, so in the 90 foot hall you would get  $0.67 \times 50 = 33.5$  minutes. Congratulations -- you have just broken the Class D Stick, Cat. II record by a cool four minutes!



A complete description of the theory and its application would be too long -- and perhaps too long-haired -- to go into at present. However the assumptions or approximations used in developing the theory should be stated. A theory is only as good as the assumptions behind it, and all theories require some simplifying assumptions or approximations. So here they are:

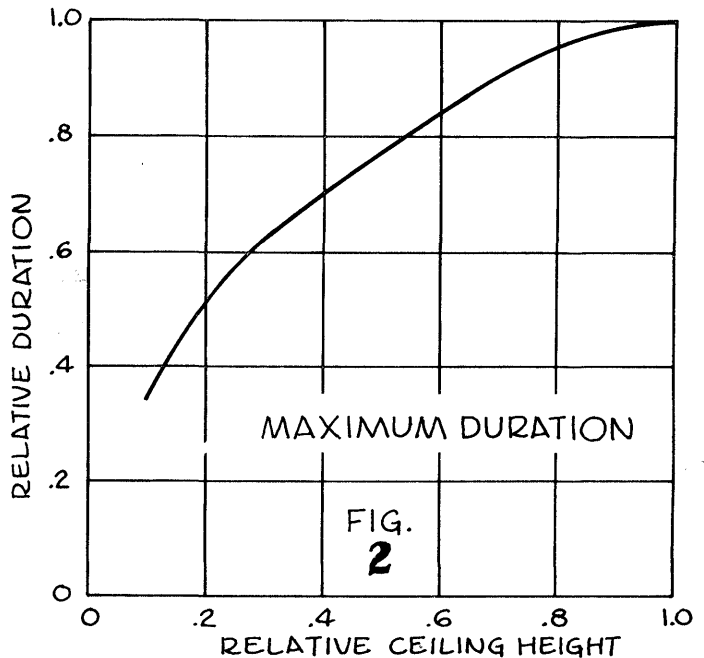
1. The angle of climb is small (but even a 30 degree climb will result in only 1% or 2% error.)
2. The same values of  $C_L$  and  $C_D$  are used for all conditions.
3. The prop has constant efficiency all thru the flight.
4. The energy that can be released from a fully wound motor divided by the weight of the motor is independent of the dimensions of the motor.
5. The shape of the torque vs. turns graph is independent of the dimensions and weight of the motor. A particular graph is used in the calculations, and it is essentially the same as the one appearing in the Hacklinger paper.
6. The prop speed decreases throughout the flight according to the following recipe:  
 $RPM/RPM \text{ fully wound} = (\text{torque}/\text{torque fully wound})^{0.17}$   
 This gives a burst/cruise RPM ratio of 1.2. (Hacklinger used a constant RPM.)
7. Ceiling-bouncing does not occur.
8. The structural weight varies with the motor weight in such a way as to make the optimum value of motor weight to airframe weight equal to 1.0 for the unlimited-ceiling condition. (Motor weight/total weight = 0.5) (See my article, "Optimum Rubber Weight..." in the March 1968 Free Flight Digest.)

Except for the no-ceiling-bouncing condition, which is an entirely separate case, I think the assumptions are quite reasonable. Perhaps the burst/cruise RPM ratio is a little low, but I don't think the final results would be greatly affected.

Bear in mind that all three of the conditions shown Fig. 1 must be met for the tune to be optimum. For example, the curve of optimum turns let out and optimum motor weight might be quite different if you impose the condition that the model touch down with zero turns remaining, instead of touchdown with optimum turns remaining.

Like most optimizations, the various curves--duration vs. turns let out for example; are quite broad near the optimum condition, so you don't have to worry if you are not exactly on the optimum point.

There are many fine points that I didn't feel it would be appropriate to discuss at this time. If sufficient interest is shown I would be glad to go into them later. I could consider the condition where ceiling bouncing does occur, for example.



# INDOOR

## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

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

### New Members!

FRED R. HARLOW, 9724 Royerton Dr., Richmond, Va. 23228  
 JAMES ILLBECK, 1415 Hamilton Ave., Janesville, Wis. 53545  
 ROBERT W. PARKS, 290 Mass. Ave., Cambridge, Mass. 02139  
 CHARLES J. STILES, IRC Co., Div. TRW, 6th Floor R & D,  
 401 N. Broad St., Philadelphia, Pa. 19108

### Family Memberships

BILLY COOK, 6319 Marty, Overland Park, Kan. 66202

### Honorary Members

LAURIE BARR, 4 Hastings Close, Bray, Berks, England

### Correction, Please

Last month we introduced Theodore Katsania, but his name really is Katsanis. Our apologies, Theodore!

### Change of Address

Bill Haught has moved from Ohio to Texas, his new address is 1600 Tyler, Arlington, Tex. 76010.

### Special Action Committee

Here is an up-to-date listing of S.A.C. instructors:

Cy Baucke, 2225 Loma Alta Dr., Fullerton, Cal. 92633  
 Harry Cook, 6319 Marty, Overland Park, Kan. 66202  
 Jim Davidson, 1815 Melbourne Ave. NE, Huntsville, Ala. 35801  
 Bob Dunham, P. O. Box 7151, Tulsa, Okla.  
 John English, 4233 East 52nd Place, Tulsa, Okla.  
 Vern & Dale Hacker, 25100 Euclid Ave., Euclid, Ohio  
 Bob Hanford, 3838 South 88th E. Ave., Tulsa, Okla. 74145  
 Carl Jaeger, Dixon, Mo. 65459  
 Phill Lawry, 221 Auburn St., Auburndale, Mass. 02166  
 Dave Linstrom, 12 Holcomb St., Simsbury, Conn. 06070  
 Jim Noonan, 7454 W. Thurston Cir., Milwaukee, Wis. 53218  
 Carl Nye, R. D. #1, Cortland, N. Y. 13045  
 Jim Richmond, 131 Pamela Dr., Bensenville, Ill. 60106  
 Roger W. Schroeder, P. O. Box 95, Holbrook, Neb. 68948  
 Jess Shepherd, 5312 Odessa, Ft. Worth, Tex. 76133  
 Charlie Sotich, 3851 W. 62nd Place, Chicago, Ill. 60629  
 Orval Stewart, c/o Falls College, 128 8th Ave. S,  
 Nashville, Tenn. 37203  
 Donald Sump, 1429 Grelle, Lewiston, Ida. 83501  
 Bud Tenny, Box 545, Richardson, Tex. 75080  
 John Thornhill, R. D. #1, Mt. Airy, Md. 21771  
 Robert Underwood, 4109 Concord Oaks Dr., St. Louis, Mo. 63128  
 Tom Vallee, 444 Henryton So., Laurel, Md. 20810  
 Lee & Brian Webster, 1000 Sycamore, Manchester, Tenn. 37355  
 Dale R. Wilson, 2626 Clement, Flint, Mich. 48504  
 Chester Wrzos, Rt. 3, Box 517, Madison Hts., Mich. 24572

### NIMAS Awards

Silver Cat. I HLG Award - 0:29.5, Harry Cook

Gold Cat. I HLG Award - 0:31.0, Harry Cook

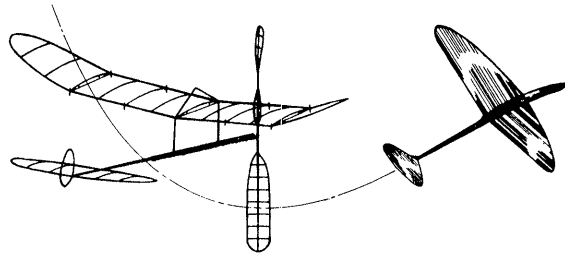
### Junior NIMAS Awards

Silver Cat. I HLG Award - 0:22.4, Billy Cook

### Help Wanted!

The NIMAS renewal slip includes a request for suggestions for topics to be covered in future issues of INAV. Two recurring requests are for material on indoor scale, with emphasis on Peanut Scale, and for HLG material.

HLG material, particularly in State Of The Art, has always been presented as received. There simply isn't as much HLG material made available as there is of rubber topics - and it isn't cricket to make it up! So, all you HLG fliers have an opportunity to make yourselves heard.



Indoor scale presents particular problems to the INAV format, since full size plans seem to be the most useful info needed by scale buffs. Due to the overseas mailing requirement, three sheets of paper is our limit; this will not support full size plans. What other service can we give to scale fliers?

### Manny Radoff Speaks!

Dear Bud;

May I say "I told you so?" The Easy B is not a beginner event anymore. The experts are beating the kids and the newcomers, so we need a new event. The "Pennyplane" is as good a name as any and is representative of the minimum weight idea. Pray tell me: Who is going to win this one? Experts, again! I say again, drop the "event" idea. Pick up the "beginner" idea. Run the newcomer event for modelers who have never placed in a contest before. Set the limit for "placed" as never having won 1st, 2nd or 3rd before, or wherever it is needed to keep them coming. With apologies to Gertrude Stein: a novice is a novice, is a novice; an expert is an expert, is an expert, and never the twain shall meet (apologies to him too!). If you want to give the novice a chance, a push onward, a thrill, a bit of hope, let him compete in his own class against novices, not experts.

However, if the same one wins more than twice, define him as an expert and move him up to another class. Keep this up until you run out of novices, then recruit more! But a weight event? Who needs it?

### Indoor Book Reprinted

Lew Gitlow has added a section on indoor scale to his indoor handbook and reprinted it. The price is \$2, and it is available from P.O. Box 2338, Leucadia, Cal. 92024.

### CONTEST CALENDAR

ARIZONA - Phoenix. Indoor sessions in Arcadia High School Gym, 7 pm to 10 pm, the second Tuesday each month. Contact Terry Thorkildsen, 3103 W. Willow Ave., Phoenix, Arizona 85029 for further details. Cat. I site.

ILLINOIS - Chicago. Indoor Scale Contest, April 26, 1970 at Forest View High School, Arlington Hts., Ill., 9 am to 4 pm. Event is not sanctioned, but uses AMA rules. Two age groups: Junior - thru 15 years; Open - 16 and over. CD: Pete Sotich, 3851 W. 62nd Place, Chicago, Ill. 60629 ph. 312-RE 5-1353.

MARYLAND - Silver Spring. Indoor sessions at JFK High School, 1901 Randolph Rd. April 10, 24; May 8, 22; June 5, 1970, 7 am to 11 pm.

MASSACHUSETTS - M.I.T. Cat. II contest, April 11, 1970 at MIT Armory, Mass. Ave. & Vassar St., Cambridge, Mass., 1:30 pm to 8:30 pm. Indoor Stick - Jr.-Sr. & Open; HLG - Jr.-Sr. & Open; Delta Dart - Jr. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. ph. 358-4013.

MICHIGAN - Detroit. Michigan State Meet, May 16-17, 1970 at Michigan State Fair Coliseum. May 16 - youth events: AMA Cub, HLG, Pre-Fab; 3 age groups below 16, 10 am to 3 pm. May 17 - AMA events: HLG - Jr. & Sr.-Open; Paper Stick - Jr. & Sr.-Open; Indoor Stick - Jr.-Sr.-Open Indoor Scale - Jr. & Sr.-Open. CD - Walter Hartung, 14759 Kilbourne, Detroit, ph. LA 7-7620.

NEW YORK - Long Island. Cat. II indoor contest at Cantigue Park, Hicksville, L. I. May 3, 1970. Site is 190' dia. dome, 50' high. HLG, Easy B, Indoor Stick, Paper Stick, Scale. CD - Bill Dunwoody, 985 Ft. Salonga Rd., Northport, L. I., N. Y.

WISCONSIN - Milwaukee. Indoor sessions each Thursday from 7:30 pm to 9:30 pm at Sherman Social Center, North 51st St. and W. Locust St. Ken Kraemer, 3945 N. 41st St., Milwaukee, Wisc. 53216, ph. 414-442-5864.

VIRGINIA - Hampton. Cat. I Indoor contest, Apr. 25-26 at Willis School. 20' ceiling. Hal Crane, 4002 Buchanan Dr. Hampton, Va. 23369.

INDOOR RULES

Ornithopter/Autogyro Commentary

The Jan. '70 INAV published some comments for reader reaction; these comments pointed out that indoor gyros and ornithopter flown by Goldberg and other old-timers didn't have and didn't need large fixed wings. In essence, why do present day models have them? One excellent comment came from Bill Hannan:

"I'll confine my comments to autogyros, although in my opinion the semi-ornithopters are just as guilty of 'bending' the rules.

In commenting on any rules, it must always be remembered that some participants delight in the form of gamesmanship known as 'bending the rules', 'beating the rap', 'finding the loopholes', etc. And, no doubt, this may offer just as much satisfaction to the proponents as playing the game 'straight'." (Editorial note: In reality, the original commentary dealt with current record holders, all of which came under FFCB scrutiny and were approved as meeting the letter of the existing rules. Several people have commented on the "intent" of the rules; the intent was never recorded for benefit of the FFCB and their discussions were necessarily limited to what the rules say.)

"However, when it comes to autogyros, any craft, model or full-size that REQUIRES (as distinct from features) fixed wings is a clinogyre, not an autogyro. Perhaps one of the chief reasons that participation in the autogyro class is limited, is that so few people have ever seen a true gyro in action.

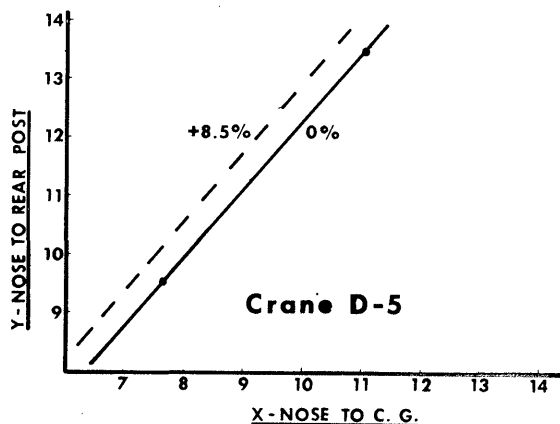
Actually, very few model builders understand the basic principles of autorotation. Witness the fact that some model gyro plans have been published which feature rotor blades mounted at a positive angle of incidence. Had these models not featured large fixed wings, they would have been unable to fly, since their rotors actually resisted flight. Even some of the designers who didn't make this particular error still relied upon large area fixed wings, with rotors adding little except visual interest.

Louis Garami, one of the most versatile model aircraft designers of all time, pointed out in the 1946 AIR TRAILS ANNUAL that the majority of model autogyros would fly with the rotors removed, but not with the wings absent!

Admittedly, making a true model gyro fly well 'ain't easy', but it can and has been done, and therein lies the challenge. There is little point in adding an anemometer to a conventional model and calling it an autogyro. Let's get a few more people interested in true autogyros. As a pleasant change of pace and a real spectator pleaser, they have few equals.

STATE OF THE ART

Hal Crane was the first U.S. flier to break 20 minutes in Cat. I, and he has made two official flights over 20 with the model of the month. Both flights were under FAI sanction, and were filed on as possible world records. The record stood briefly, only to be recaptured by Jiri Kalina. Hal's top mark was 20:21.8, and Jiri boosted it to 21:06. Both Hal's 20 minute flights were ceiling-scrubbing flights (as was Kalina's), and the model is one of a long line of models Hal has developed especially for this type of flight. The prop is also quite stiff; unlike most Cat. I props, it does not flare appreciably under the low values of launch torque used in Cat. I. Stiff wing tips have proved to be important in the Willis site, where models often drift into the wall. Stiff tips greatly improve wall recovery, besides aiding steering so often needed in small sites like Willis.



TOP TEN CEILING DODGERS

	Time/ceiling	Fudge (to 35')	Est. Altitude	Score
1. Tom Vallee	810/20'	1.32	19'	1068.2
2. Hal Crane	682/20'	1.32	19'	850.2
3. Dick Hardcastle	602/23'	1.23	22.5'	743
4. Howard Haupt	456/22'	1.26	15'	575
5. Hewitt Phillips	428/20'	1.32	7'	564.9
6. Harry Cook	471/26'	1.16	24'	546.5
7. Jim Davidson	280/13'	1.64	9'	459
8. Richard Sironen	308/37'	.972	33'	396.6
9. Roger Schroeder	239.5/15'	1.53	13.5'	365.9

TOP TEN EASY B

The Top Ten Easy B listing is suspended annually, as the winners of the Easy B section of the NIMAS Postal are enthroned as the new Top Ten after the postal.

NIMAS POSTAL MEET

Remember that all entries in the NIMAS Postal must be postmarked by April 30, 1970. Send them to Bob Putman, 507 Darlene, Arlington, Tex. 76012. See the Mar. '70 INAV for complete rules listing.

RECORDS? MAYBE!

BRAINBUSTER RECORD CHALLENGE MEET, Mar. 7, 1970, Cat. I Willis School, Hampton, Va. 20' ceiling.  
Open FAI Cat. I FAI - 19:13.2, Hal Crane  
Open AMA Cat. I FAI - 19:58.0, Hal Crane

INDOOR ELSEWHERE

In recent weeks we have received results from the national indoor contests of three countries. The 1969 Nats of Argentina were held last April, with the 1970 Nats scheduled for March. The New Zealand Nats were held in Jan. '70, and the Romanian Nats in February.

Argentina Nats; 65 cm models, 33' ceiling.

Contestant	Best 2 of 6 (sec.)
Nereo Beggiatto	1467
Julio C. Martinez	1274
Alberto Barilari	1262
Hector Beggiatto	1108
Alberto Collazzo	1107
Miguel A. Leone	665
Eduardo Grippo	356
Domingo Saacone	227

Argentine fliers are enthusiastic, but are limited by lack of good materials, especially balsa. Indoor flying was added to their Nats schedule in 1960. The activity has grown slowly each year, until 1969 activity had grown to five contests with good entry in each.

New Zealand Nats; 28' max. ceiling with cluttered ceiling.

IHLG	Easy B	Open Spar
M. Stringer 27.5	P. Lagan 7:27	T. Martin 8:32
T. Martin 26.2	T. Martin 5:15	P. Lagan 7:33
P. Lagan 25.2	M. Stringer 4:48	B. Keegan 6:09
R. Magill 24.8	R. Magill 4:09	M. Stringer 4:09
M. Bundock 24.3	W. Clemens 3:54	R. Magill 3:52
G. Burrows 23.8	A. Graves 3:37	B. Roots 3:45

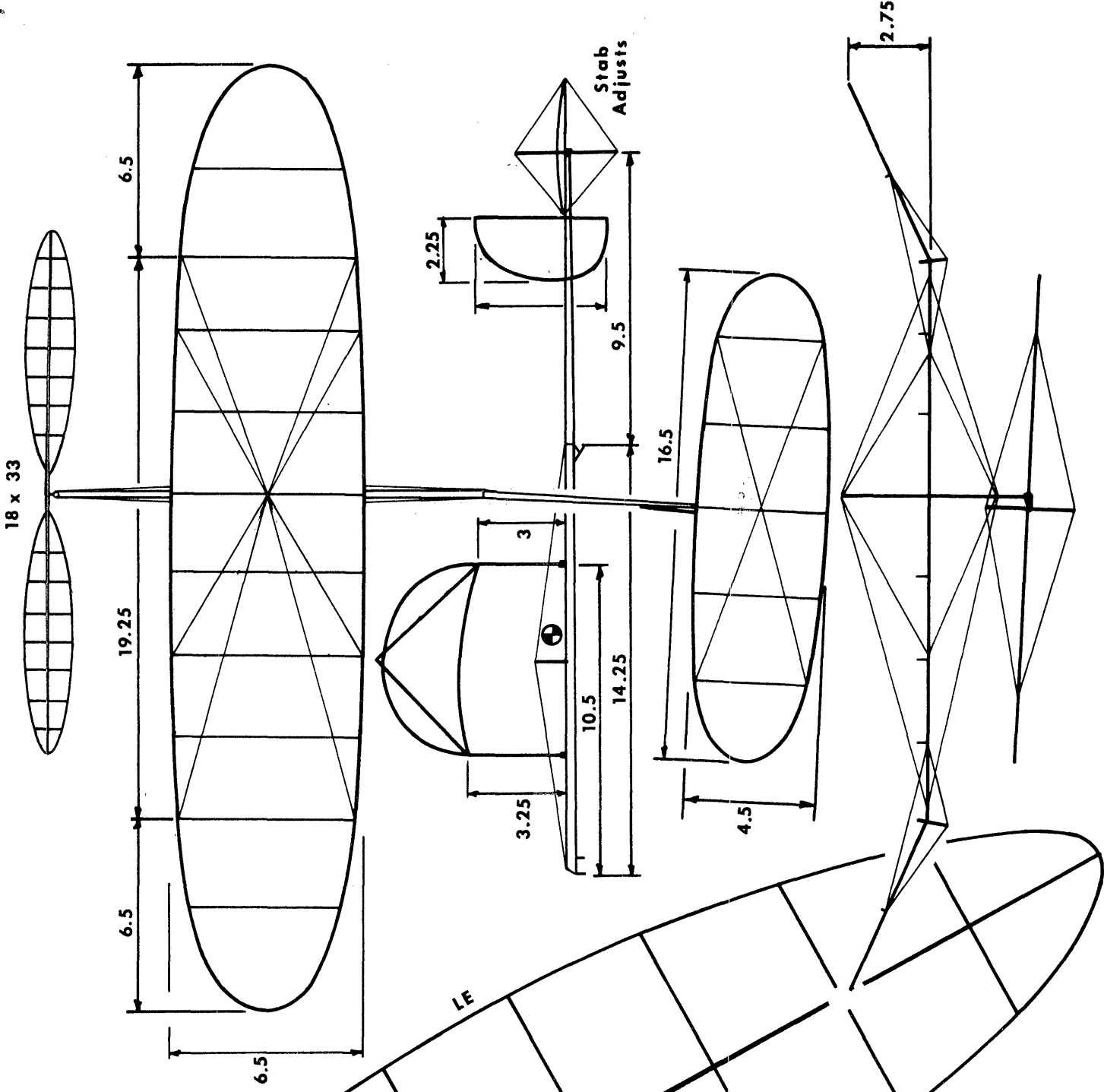
HLG, with 35 entries, was hotly contested. The single best of six flights decides the winner, and the cluttered ceiling bothered everyone but Stringer, whose very light 16" Sweepette did its time under 24". Paul Lagan's model resembled a Stompette, and did 31.4 after the meet for a new national record. The Easy B event's 15 entries were permitted to use microfilm, so some of these models also turned up in Open Spar (indoor stick). Trevor Martin's Spar winner was FAI size, while other entries varied considerably in size.

Romanian Nats; 65 cm models, Slanic salt mine.

Aurel Popa	33:16	34:00	67:16
Otto Hints	30:30	34:09	64:16
Aurel Moraru	23:32	23:45	47:17
Ferencz Boloni	22:52	23:17	46:09
Vasile Nicocara	22:28	22:50	45:18

This contest drew 33 contestants from 11 towns, who enjoyed several improvements in the site made in preparation for the World Champs. The team from Turgu-Mures won the championship for the 17th year in a row, with 18 year old Aurel Popa leading the way. Results have not been received from an international meet held in Slanic in March, but teams from Hungary, Czechoslovakia and Germany were expected to attend.





Weight, Oz.

Wing	.016
Prop	.009
MST	.0195
Rubber	<u>.0415</u>
	.086

**D-5 by HL Crane**  
**20:21.8/20'1"**  
**May 18, 1969**

**AERONUTS PENNYPLANE MEET**

**QUESTIONS AND ANSWERS**

The Pennyplane meet, first sponsored by the Chicago Aeronuts (rules in Feb. '70 INAV) produced the following results from an entry list of 14 fliers: (AMA scoring)

- Open (18 and over)
1. Chuck Markos 4:17.8
  2. Jim Richmond 4:10.2
  3. Charlie Sotich 3:58.2
  4. Gordon Wisniewski 3:50.0
  5. Jim Noonan 3:47.5

- Juniors
1. Robby Lyons 1:11.0
  2. Scott Wisniewski 1:08.0
  3. Tim Noonan 0:36.2

**LOW CEILING TUNE - FOLLOW-UP**

Not long after Bob Meuser sent his "Optimum Tune For Low Ceiling Flight", Jim Richmond sent a graph of flights made with his models over a couple of years. This graph is in Fig. 1 below, with some of the data points identified according to site and date or time. Note also that the points are marked according to whether the models weighed about .020 oz. or .024 oz. Of the graph Jim says, "I just got the idea that a chart of my best flights might be of interest, but the points proved to be so uniform that I believe a fairly accurate performance curve has been generated. Perhaps this kind of curve is typical for indoor models? None of the flights were aided by rafter-banging and the altitudes shown are flight altitudes and not ceiling heights." (Ed. note - the flight identified as "Wash. Pk. II Rcd." did hit obstructions, but these were collisions with lights, etc., which caused the model to lose altitude. Thus this flight might have fallen on the curve instead of below if the lights hadn't been there.)

"One interesting observation is that the .020 oz. planes don't really show a clear-cut advantage over the .024 oz. planes anywhere except perhaps at the 145' level. This is definitely inconclusive though, due to the lack of testing done at heights over 100'."

Fig. 2 is snuggled into the corner of Fig. 1, and was the work of Bob Meuser in response to Richmond's graph. He normalized Jim's data for a maximum altitude of 200' and 250', after setting the Richmond curve equal to his Fig. 2 at  $h/h_{max} = 0.4$ . The two normalized Richmond curves are coincident at low values of  $h$  and spread at high  $h$ , as can be seen in Fig. 2.

It is interesting to see such good agreement between theory and practice, and also interesting to have such a well documented flight performance curve!

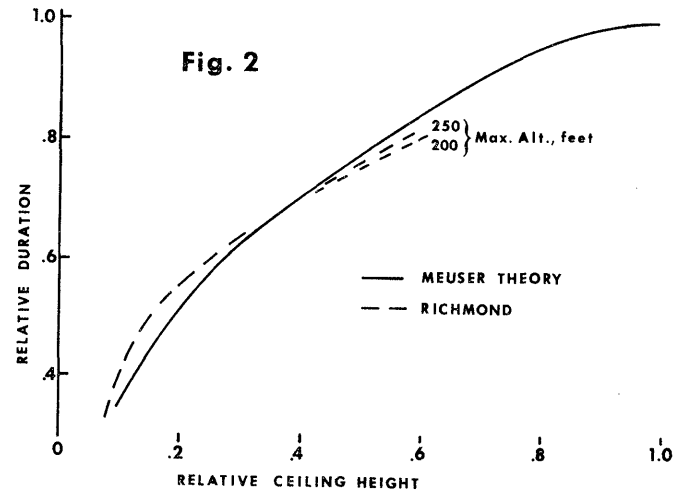
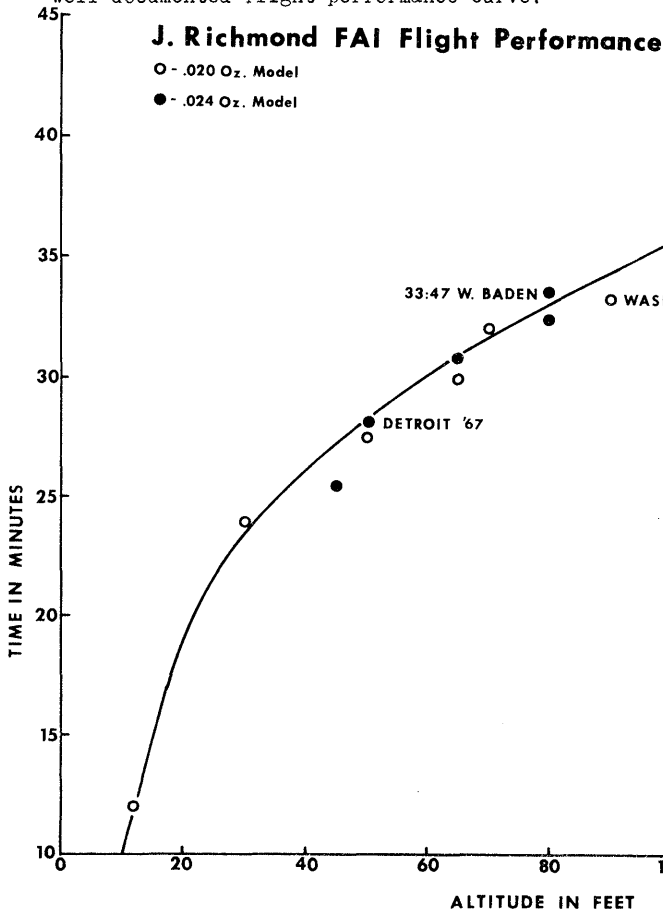
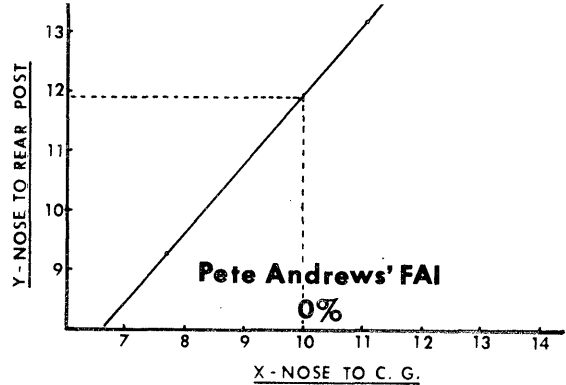
41. How is the CMOS balance chart used to locate the wing on (1) a model built from INAV three-view; (2) a new model or new design?

In either case, you must decide what margin of stability to use. General practice on top-notch models seems to average about 0% margin, with a few models even set up for -10% or -20%. It seems unlikely that more than -5% margin is useful for any but very good conditions, but special record attempt models can gain marginally in efficiency by using a more sensitive adjustment.

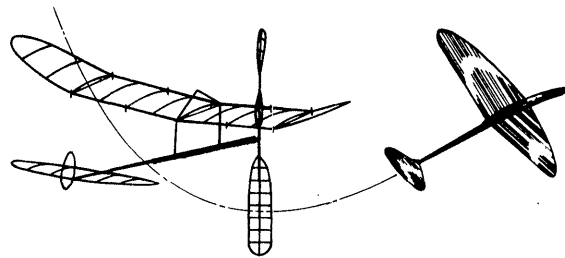
If we assume that 0% margin is satisfactory (as shown in INAV), balance the model, complete with prop, motor and tail surfaces, just as always. Measure from this balance point to the thrust bearing; this is the distance "x" on the CMOS chart. Extend "x" upward to the balance line and then project this intersection point horizontally to the "y" ordinate and read the "y" value. Locate the rear wing post "y" inches from the thrust bearing and the front post to fit wing width. The model's basic characteristics are now established, and final trim is all that remains.

On a new design, the CMOS chart must be drawn. This procedure is detailed in the Jan. '69 INAV, and a packet of instructions is available on request from Box 545, Richardson, Tex. 75080.

If other than 0% margin is used, the new balance line will be parallel to the 0% line, but displaced to the side. For example, if the model's average wing chord is 4", a balance line corresponding to +10% would be .4" to the left of the 0% line; -10% would be .4" to the right.



# INDOOR



## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

OFFICIAL RESULTS - 1970 INDOOR WORLD CHAMPIONSHIP

1.	Jiri Kalina	Czechoslovakia	<u>37:52</u>	34:13	15:55	<u>36:25</u>	26:44	34:58	74:17
2.	Jim Richmond	U. S. A.	5:34	<u>32:04</u>	31:54	<u>32:10</u>	00:14	00:27	64:14
3.	Aurel Popa	Romania	25:16	21:40	<u>32:50</u>	00:07	30:23	21:58	63:13
4.	Andras Ree	Hungary	<u>28:21</u>	<u>31:28</u>	21:08	00:11	00:08	18:27	59:49
5.	Vilim Kmoch	Yugoslavia	24:36	<u>29:04</u>	27:21	27:55	20:30	11:07	56:59
6.	Clarence Mather	U. S. A.	24:13	27:10	22:45	<u>27:12</u>	<u>23:28</u>	15:53	55:40
7.	Eduard Chlubny	Czechoslovakia	<u>25:55</u>	00:00	08:11	<u>28:20</u>	19:02	22:08	54:15
8.	Karol Rybecky	Czechoslovakia	00:00	00:21	<u>25:44</u>	<u>27:42</u>	00:11	21:29	53:26
9.	Gyorgy Buzadi	Hungary	18:10	24:25	<u>25:55</u>	00:58	<u>25:54</u>	22:47	51:49
10.	Esko Hamalainen	Finland	<u>23:47</u>	<u>27:48</u>	02:12	18:54	06:55	11:52	51:35
11.	Carlo Cotugno	Italy	<u>24:18</u>	23:45	00:34	<u>26:21</u>	20:57	13:37	50:39
12.	Pete Andrews	U. S. A.	<u>27:52</u>	<u>22:11</u>	17:03	13:41	16:41	18:32	50:03
13.	Nieu Bezman	Romania	<u>22:43</u>	<u>27:17</u>	18:24	19:57	00:16	00:32	50:00
14.	Pentti Nore	Finland	00:13	13:36	00:38	<u>23:20</u>	<u>24:48</u>	07:43	48:08
15.	Otto Hints	Romania	20:22	21:16	<u>23:50</u>	21:40	<u>24:11</u>	13:10	48:01
16.	Antal Egri	Hungary	12:57	<u>23:01</u>	19:21	<u>24:07</u>	22:58	00:09	47:08
17.	Werner Wetzel	Germany	<u>23:04</u>	20:22	20:09	13:55	<u>23:04</u>	00:38	46:08
18.	Kurt Vogel	Germany	10:48	00:08	<u>21:41</u>	00:09	<u>19:27</u>	17:33	41:08
19.	Gabriel Leopold	Yugoslavia	<u>20:43</u>	19:52	07:25	07:22	<u>19:53</u>	14:28	40:36
20.	Germano Masciullo	Italy	00:45	00:26	15:00	<u>16:42</u>	12:25	<u>22:23</u>	39:05
21.	Stefan Bombol	Poland	13:23	17:55	00:18	<u>18:26</u>	<u>18:06</u>	17:32	36:26
22.	Edward Ciapala	Poland	<u>18:19</u>	15:06	09:23	13:59	<u>18:06</u>	00:27	36:25
23.	Guy Cagnet	France	11:01	02:33	<u>15:36</u>	12:25	<u>19:34</u>	04:58	35:10
24.	Hans Beck	Germany	<u>18:39</u>	00:30	01:09	<u>16:07</u>	13:53	00:00	34:46
25.	Ryszard Czechowski	Poland	<u>13:17</u>	09:43	00:58	<u>21:02</u>	00:16	00:17	34:19
26.	Egizio Corazza	Italy	10:00	<u>16:47</u>	03:17	<u>16:19</u>	07:42	11:36	33:06
27.	Teodor Strasberger	Yugoslavia	07:17	00:50	<u>19:19</u>	11:06	07:09	<u>12:53</u>	32:12
28.	Jean C. Souvetou	France	05:39	09:01	09:43	10:15	<u>11:35</u>	<u>15:10</u>	26:45
29.	Harri Raulio	Finland	00:20	09:54	10:26	08:02	<u>12:35</u>	<u>11:58</u>	24:33
30.	Daniel Degaugue	France	00:00	00:00	00:00	00:00	00:00	00:00	00:00

TEAM STANDINGS

1.	Czechoslovakia	74:17	54:15	53:26	181:58
2.	U. S. A.	64:14	50:03	55:40	169:57
3.	Romania	48:01	63:13	50:00	161:14
4.	Hungary	59:49	51:49	47:08	158:46
5.	Yugoslavia	56:59	32:12	40:36	129:47
6.	Finland	51:35	48:08	24:33	124:16
7.	Italy	33:06	50:39	39:05	122:50
8.	Germany	34:46	41:08	46:08	122:02
9.	Poland	36:26	36:25	34:19	107:10
10.	France	35:10	26:45	00:00	61:55

## THE 1970 INDOOR WORLD CHAMPS

I would like to dedicate this issue to the Romanian Aero Club and all the many others in Romania who made such a dedicated effort to make the Championship a meaningful and memorable experience for all who attended. Outstanding hospitality and careful attention to detail were the order of the day, according to all who attended.

My thanks to Jim Richmond and Clarence Mather for the two reports below, and to Erwin Rodemsky for the pictures. Erwin has a report in the Aug. '70 AAM, but these pictures had to be specially developed and were delayed beyond the deadline of the magazine.

Report by Clarence Mather: The 1970 Indoor Internationals involved a long, arduous journey and the most challenging of flying conditions. Yet I found both extremely interesting and I had a great time. I'm very appreciative of the opportunity to go. The living and working conditions of many European peoples should be seen by every American.

There was great competitive spirit at the contest, yet I found the contestants to be friendly and helpful without exception.

The officials organized the contest and the personnel arrangements very well so that everything went smoothly. We were housed in a small hotel which made it possible to visit and confer with other contestants by merely taking a few steps down the hall. The mine entrance was within walking distance of the hotel. The hotel people worked diligently to make our stay pleasant.

Flying conditions were most difficult. We had been warned of the cold and so we tried to prepare. I built very thin wings and lower pitch, stiffer props. Together with my faithful helper, Fudo Takagi, I test flew in the chill early-dawn hours at our small site.

I used two-inch motors together with a carefully weighted stick to simulate a full-length motor. The models would easily out-climb the twenty-two foot ceiling on 200 winds - less than full turns. The models were test loaded at full winds on oversize motors to be certain of their strength.

In the mine the models climbed about 100 feet and came down in about twenty-five minutes. The models that were doing well were rocketing up the first 100' in two minutes or so! All models seemed to stop climbing in five or six minutes. We built new props (from old ones) right at the hotel - mainly lower pitch and with more area behind the spar. Such a prop got my models up well, but now they un-wound and dead-sticked some 80-90 feet up in just over 30 minutes. We also used larger rubber, and after some testing we decided that Pete had the best. He generously shared it with us.

I modified a second prop and it tested somewhat better than the others, but the model drifted into a wall and still hangs there in the mine! A prop that would flare into slightly lower pitch for the initial climb then go to higher pitch for the cruise and descent was needed. It was difficult to get it just right.

The real disappointment was the drift. The extra lights and additional people really stirred up the air and we had up-drafts, down-drafts and drift resulting in hung models. Pete's models hit the wall several times and wrecked at least one wing. One of Jim's models still is on the wall, and he damaged at least one other model on the wall. I hung three models on the wall and left two of them there. But all in all, international travel is a fine experience and I heartily recommend it!

Report from Jim Richmond: I wish we could say "we won it", but such is not the case this time. The salt mine proved to be a terribly difficult flying site, especially for us because of our lack of experience there. The conditions were much different from any we had ever encountered before. I have made good flights in cold air, but this experience didn't help at all. All of us found it necessary to use much more power than we had ever used before to get the planes up. Our props were also found to be inadequate, and we resorted to building new ones and to bracing and twisting lower pitch into the ones we had. In order to get good time, it was necessary to get all the way up (and all the way back down), but few people were able to do this successfully. Kalina and Aurel Popa (an amazingly capable 18 year old competitor) were the only ones showing any degree of consistent high altitude capability. Planes that got only 1/2 or 2/3 of the way up were lucky to get 30 minutes or to get down at all without drifting into the wall and hanging on the salt crystals.

I had two flights get all the way up. The first was a test flight which went "dead-stick" while still half-way down for about 37 minutes. The second was an official with more turns which lost about 35' sliding down the tapered top wall section; it finally hung on the wall about 35' up. This was my fourth round flight which still managed 32:10, but I felt it would have cleared 40 minutes if it hadn't had problems on the way down (Kalina thought so too).

This site is probably excellent ordinarily, but it was filled with convection currents, drafts and what seemed to be temperature inversion layers after all the people, lights and electric heaters were introduced. The carnage of planes lost and wrecked on the walls was much worse than anything I had seen before. The U. S. team members were all down to their last planes (pieced together from whatever was left) in the last round.

It is a shame that one of my last two attempts didn't make it. I had the right prop-motor combination with plenty of turns (2200), but there was no way to test the flying capability of such laced-up machines as no testing was permitted between rounds. My Round 5 flight tucked under and came down and the 6th round flight climbed too steeply, got over on its back and collapsed the wing. Both planes destroyed themselves. The 1st round model was adjusted well, but got into the wall at about 100' and came to rest on a ledge. It will spend eternity there in good company with one of Chlubny's models.

No balloons were used during the meet, but most planes were dislodged from the wall with long poles or with puffs of air from a blanket. Most of the retrieved models were damaged to some degree in the process.

My third round flight had a good start but was in a down-draft and just flew around with the nose up, trying to climb. It got no more than 2/3 of the way up. Kalina made some excellent flights from the same spot, but he seemed to have the air under control. It behaved for him instead of killing his climb as it did for me.

Oh well. We had our problems, but we did manage to make a fair showing. The salt mine is a fantastic place with its gigantic underground chambers. The ride up and down was an adventure we will never forget. The elevator was an unlighted steel box hung on a single cable and it was operated, it seemed, with wild abandon. The thing went up and down like a shot and was guided by banging against the walls of the shaft.

We were treated like royalty in Slanic and the whole town was decorated with posters, banners and flags. I think it must have been the biggest event in the country. We were on TV and radio, and movies were made of us.

During the opening ceremony, we were all lined up behind our respective flags with the team managers in front. Girls brought flowers to each manager and gave him a kiss. Our time in the cold mine had already made Joe Bilgri a little sick, and he was in bed for two days afterward. We all had our problems with illness of one kind or another, and the Romanians were about frantic with concern for our health.

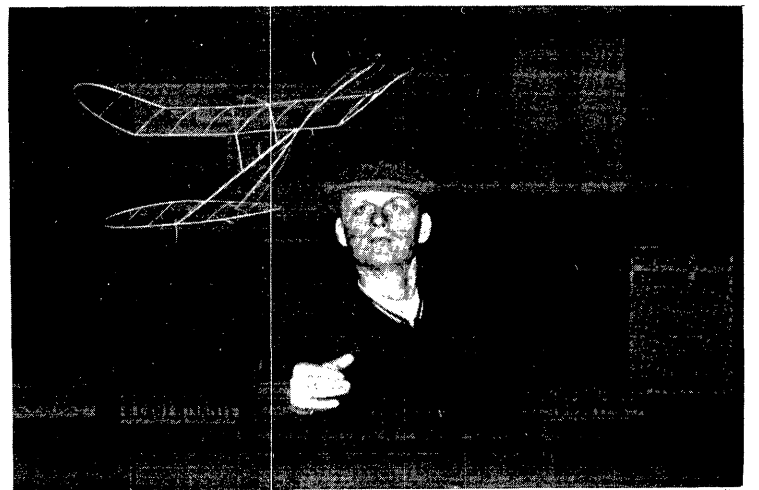
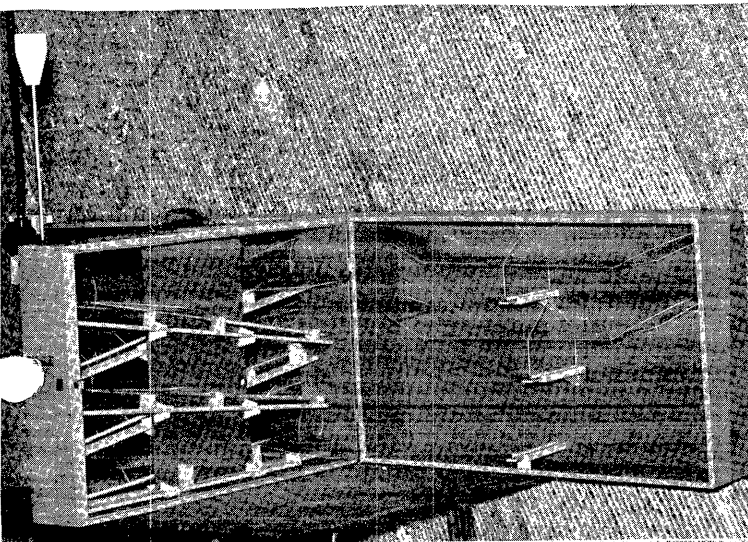
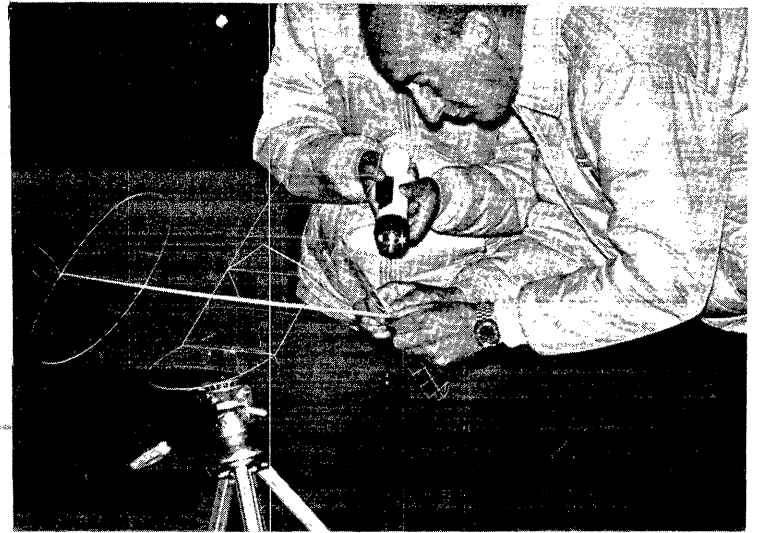
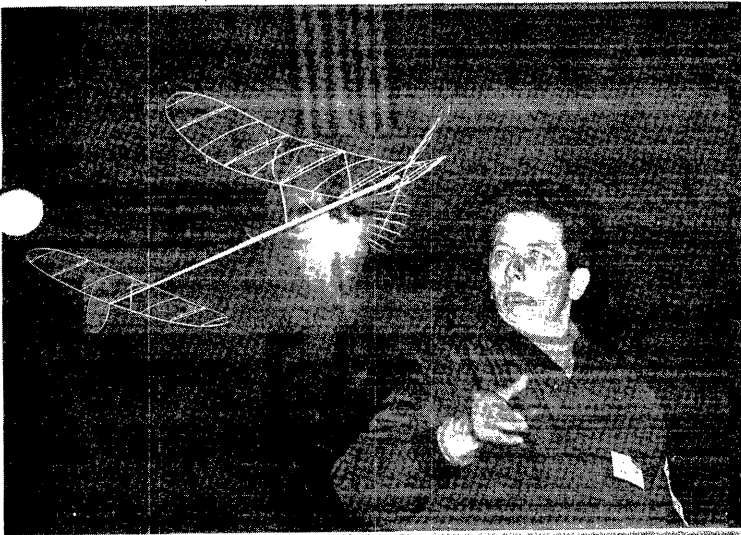
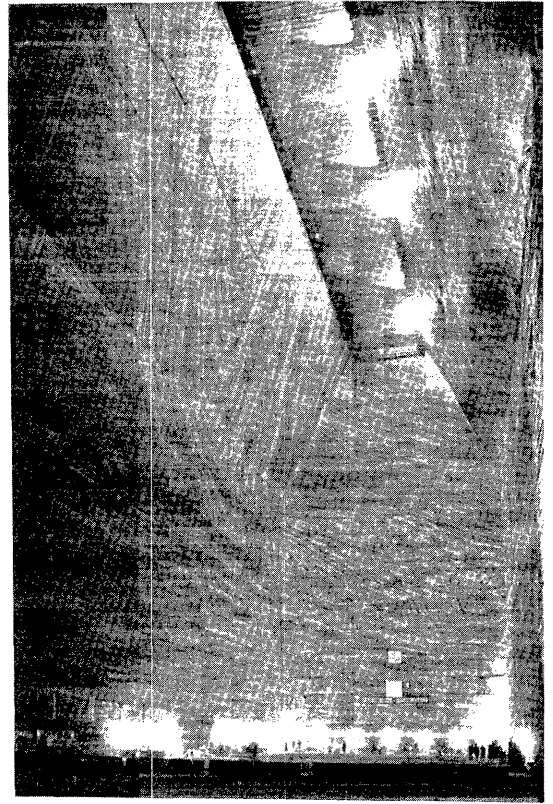
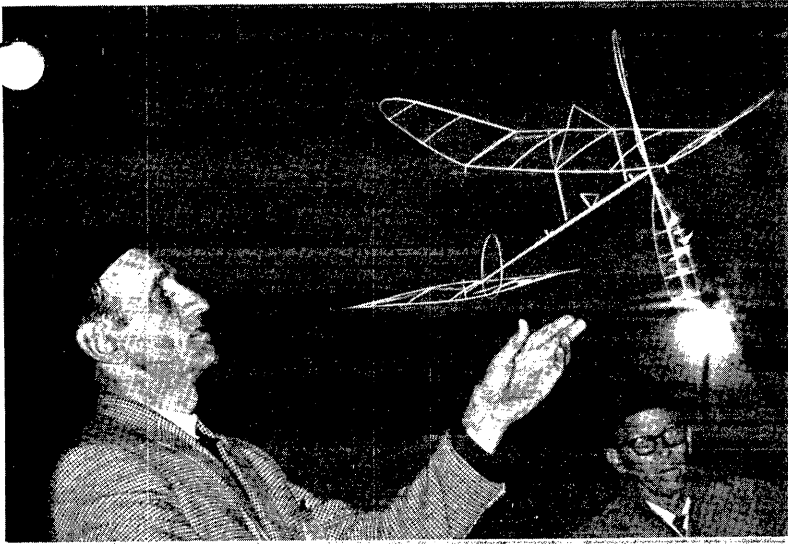
None of us will forget this visit to a far corner of the Earth. Traveling behind the Iron Curtain was quite a unique and memorable experience. I wish certain segments of our population could make the same trip. I'm sure most of them would count their blessings all the way home and would have a new respect for our fine way of life.

### Additional Details

Kalina's model was reportedly similar to previous models he has flown, with his usual excellent craftsmanship. The prop was 17 x 32 with narrow, symmetrical blades, and the very light weight of the model (.017 to .019 oz.) permitted relatively small cross section rubber to be used for high number of turns. Even so, the model would dead-stick from about 50 feet.

Even though extra lighting was furnished, several of the fliers had helpers with head-mounted lights (coal mine style) which they aimed at the model's rear hook area to aid in motor hookup.

Informal FAI meetings yielded a majority consensus to require international class models to weigh a minimum of one gram, and to power them with a maximum of one gram of rubber. This was prompted both by the extreme loss of models and by the general unavailability of balsa suitable for ultra-light weight construction. The one gram weight is about right to permit craftsmen of all nations to compete on the basis of building and flying skill, without handicapping those who have no access to superior balsa.



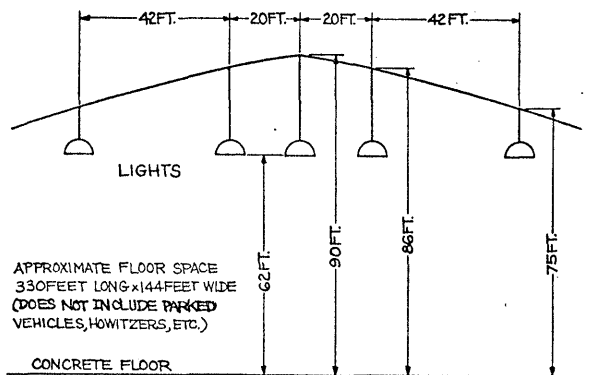
\*\*\*\*NATIONAL INDOOR MODEL AIRPLANE SOCIETY\*\*\*\*

Honorary Members

H. HALMSHAW, 57 Stockdale Rd. Traralgon, Victoria,  
Australia 3844  
MARBER A. MARTINEZ SPOSITO, calle Pernas 2490, Apto. 102  
Montevideo, Uruguay

170 Nats

The indoor portion of the 1970 Nats will be held at the Washington Park Armory, 5200 S. Cottage Grove Ave. in Chicago. Indoor rubber powered events (Indoor Stick, Paper Stick and Indoor Cabin) will be flown 9 am to 9 pm, Monday, July 27, 1970; Indoor HLG and Flying Scale will be held the same hours on Tuesday, July 28, 1970. Some sort of time split will be made for HLG and Scale, but this has not been announced. An end view elevation of the Armory is shown below, and the June and July issues will carry directions for reaching the Armory from Glenview NAS. All registration must be done at Glenview NAS; registration can be completed at Glenview NAS on Sunday, July 26, 1970.



"Extra" Nats Events

The Cloud Busters Club of Detroit is sponsoring the Peanut Scale event at the Nats; it will be flown at the same time as the regular scale models. These rules will be used:

1. Model can be to any scale; contestant must furnish proof of scale for rare or unusual subjects, but magazine or other published plans are OK.
2. Flight points = one point/second of flight for a three flight total.
3. Unlimited attempts for 3 official flights.
4. Five seconds constitutes an official flight.
5. No microfilm allowed.
6. Bonus points awarded for the following:  
R.O.G. (1 allowed) 5 points  
Workmanship Up to 5 points  
Scale Documentation Up to 5 points

The Chicago Aeronauts will sponsor a PennyPlane event at the 1970 Nats, to be flown concurrently with IHLG and Indoor Scale at the Washington Park Armory. The rules to be used are:

1. Model must weigh (less motor) at least as much as a new copper penny.
2. Model must not exceed 18" in length (including prop) or wingspan.
3. Motor stick (from front of thrust bearing to rear hook) must not exceed 10"
4. Single rubber motor and prop (no gears).
5. Motor must not be enclosed in body or motor stick.
6. AMA scoring (best single flight of five).

Attention, Teachers!

Pat McDonald, 3539 B Street, Oxnard, Cal. 93030, has received permission and backing to begin a model building program for his sixth grade youngsters. He would like to correspond with others who now have a similar situation, or have had such in the past. So, drop him a line and both you and he stand to learn a lot!

Postal Rates

It seems likely that postal rates will soon be raised 33 1/3% on First Class mail. Although this directly increases cost per issue of INAV by 16%, it will not be reflected in subscription rates at this time. However, each of us continues to receive numerous Third Class or "junk mail" items each week, and the cost of this service (?) may be a luxury we can no longer afford. Perhaps a dramatic protest would be in order! How about saving all of your junk mail, and sending each week's receipts to one of the following addresses: (Use First Class postage so you can include a note explaining your feelings.)

Senate Post Office And Civil Service Committee  
U. S. Senate  
Washington, D. C.

House Post Office And Civil Service Committee  
U. S. House of Representatives  
Washington, D. C.

Postmaster General  
1200 Pennsylvania Ave, N.W.  
Washington, D. C.

CONTEST CALENDAR

ARIZONA - Phoenix. Indoor sessions in Arcadia High School Gym, 7 pm to 10 pm, the second Tuesday each month. Contact Terry Thorkildsen, 3103 W. Willow Ave., Phoenix, Arizona 85029 for further details. Cat. I site.

MARYLAND - Silver Spring. Indoor sessions at JFK High School, 1901 Randolph Rd. May 22, June 5, 1970, 7 am-11 pm.

MICHIGAN - Detroit. Michigan State Meet, May 16-17, 1970 at Michigan State Fair Coliseum. May 16 - youth events: AMA Cub, HLG, Pre-Fab; 3 age groups below 16, 10 am to 3 pm. May 17 - AMA events: HLG - Jr. & Sr.-Open; Paper Stick - Jr. & Sr.-Open; Indoor Stick - Jr. & Sr.-Open; Indoor Scale - Jr. & Sr.-Open. CD - Walter Hartung, 14759 Kilbourne, Detroit, ph. LA 7-7620.

TEXAS - Wichita Falls. Class AAA meet with FF, Combat and Rat Race PLUS Paper Stick, Indoor Stick, HLG and Scale, July 3, 4, 5, 1970. The indoor events are to be held in the evening on July 3 and July 4 in a new 76' domed coliseum which appears to be an excellent site. Contact Sam Casey, 3900 Gayle, Apt. B, Wichita Falls, Tex. 76301.

WASHINGTON - Seattle. Model Aeronautics Scholarship Contest with FF, Rocket (NAR not AMA), U/C, RC and Indoor. Indoor events - HLG and Easy B. Sponsored by Boeing Management Association, Boeing Aircraft, P. O. Box 3999, Seattle, Wash. 98124. For details of indoor site: Jim Walters, 240 SW 184, Seattle, Wash. 98166. June 20-21, '70.

WISCONSIN - Milwaukee. Indoor sessions each Thursday from 7:30 pm to 9:30 pm at Sherman Social Center, North 51st St. and W. Locust St. Ken Kraemer, 3945 N. 41st St., Milwaukee, Wisc. 53216, ph. 414-442-5864.

NIMAS POSTAL MEET

The entry was exceptionally light this year, as can be seen below. In particular, there are no entries from the South; Tulsa activity has been low and loss of the Dallas-Ft. Worth site stopped activity entirely. Don't put all your site "eggs" in one basket!

OPEN EASY B	Time/ceiling	Fudge	Adj. Time
1. Bob Platt	558/8/20'	1.323	739.2
2. Clarence Mather	556/22.3'	1.26	696.6
3. Joe Portecorvo	485/17.75'	1.404	681
4. Hal Crane	511/1.25'	1.32	675.9
5. Harry Cook	538/26'	1.16	624.2
6. Jim Walters	382/17.75'	1.404	536.4
7. Fudo Takagi	356/21'	1.29	459.6
8. Howard Haupt	312/21'	1.29	402.8 1st Sr.

JUNIOR EASY B	Time/ceiling	Fudge	Adj. Time
1. Dave Sandelius	449/17.75'	1.404	630.5
2. Rick Sironen	331/17.75'	1.404	464.8

Class I Open HLG	Time/ceiling	Fudge	Adj. Time
1. Don Teeples	58/20'	1.25	72.5
2. Jim Walters	59.4/25'	1.0	59.4
3. Joe Deady	54/25'	1.0	54.0

OPEN INDOOR STICK	Time/ceiling	Fudge	Adj. Time
1. Bob Platt	1266/20'	1.323	1674.7
2. Howard Haupt	465/21'	1.29	600.3 1st Sr.

THE PICTURE STORY

Upper Left: Clarence Mather launches, Bilgri in background. Note warm clothing.

Center Left: Hans Beck, 1966 World Champion.

Lower Left: Excellent box design by Eduard Chlubny. Note that it opens in three sections, giving access to all models. A smaller box of same design by Vilim Knoch had built-in lighting system!

Upper Right: Time exposure, wide angle lens shot of The Site. Note the size of the people in lower right foreground. This is entire official area.

Center Right: Egizio Corazza; he used a camera tripod for winding stooge.

Lower Right: Jiri Kalina and championship model.



# INDOOR

## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

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

New Members!

STEVE BANDT, 4 N. Wisconsin St., Janesville, Wis. 53545

Honorary Members!

RON DRAPER, 15 Court Leet, Binley Woods, Coventry CV3-2JQ, England

Special Action Committee

Add the following name to your list of instructors who will help people to learn to build and fly indoor models:

RICHARD MILLER, JR., P.O. Box 877, San Leandro, Ca. 94557

Nats Info - SPECIAL NOTE

Last month's announcement that Indoor registration could be done at Glenview NAS on Sunday was in error - no contestant access to the base will be permitted until Monday, June 27, 1970. Therefore read the following memo supplied by AMA HQ carefully:

Special arrangements have been made to permit advance entrants (those who postmarked Nats entry forms to AMA HQ no later than June 22) to register and have certain problems taken care of at the Indoor site as follows:

1. Monday, July 27, 9 am to noon.
  - a. Nats registration (officially check in, obtain Nats identification and contestant information kit). This is necessary before any official flying takes place.
  - b. Housing Priority. If your copy of the entry form indicates you have such priority, you may claim it.
  - c. Navy Meals. Tickets for same may be purchased.
  - d. Add Events. These may be entered and paid for.
  - e. Entry Discrepancies. Any money or entry form problems, indicated by "report to desk P" notation on entry form.
2. Tuesday, July 28, 9 am to noon.
  - a. Nats Registration only, as above. No housing, meals, or event problems can be taken care of at the indoor site on Tuesday.
  - b. Entry discrepancies, as above.

Note: Noon is the cutoff time on both Monday and Tuesday. HQ workers who will provide these services must be at Glenview NAS by 2 pm each day.

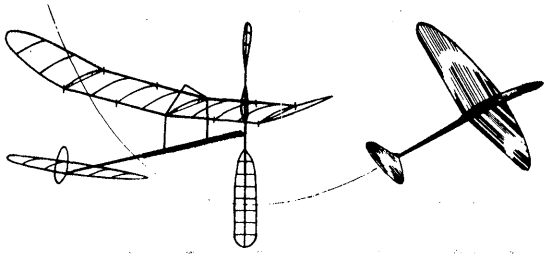
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Scale Documentation	Up to 5 points

The Chicago Aeronuts will sponsor a PennyPlane event at the 1970 Nats, to be flown concurrently with IHLG and Indoor Scale at the Washington Park Armory. The rules to be used are:



1. Model must weigh (less motor) at least as much as a new copper penny.
2. Model must not exceed 18" in length (including prop) or wingspan.
3. Motor stick (from front of thrust bearing to rear hook) must not exceed 10"
4. Single rubber motor and prop (no gears).
5. Motor must not be enclosed in body or motor stick.
6. AMA scoring (best single flight of five).

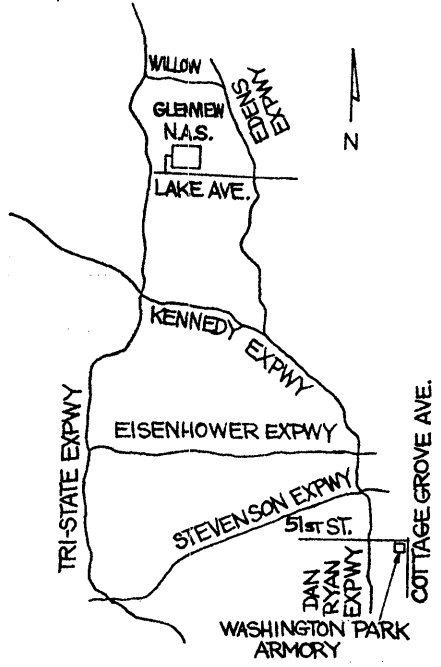
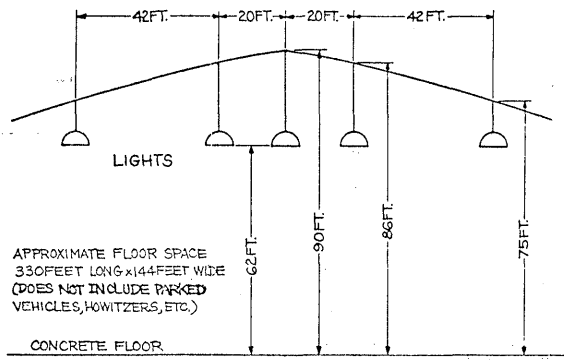
Proxy-Fly PennyPlane

The latest news about the Nats PennyPlane event (see above), is that you can have your model proxy-flown. The entry fee (regular or proxy) is 1¢ per entry, and you can enter in person or send your entry to Erwin Rodemsky, 205 Frances Lane, Barrington, Ill. 60010.

Other Nats Info

1970 Indoor Nats events will be held in the Washington Park Armory in Chicago. Immediately below is a cross-section view of the site, and below that is a map of Chicago and areas north to Glenview NAS, with a description of the best route to follow.

The event schedule is as follows: Indoor rubber powered events (Indoor Stick, Indoor Cabin and Paper Stick) will be flown July 27, 1970 from 9 am to 9 pm. Indoor HLG and Indoor Scale will be flown Tuesday, July 28, for the same hours.



You must enter the Armory at the North end of the building. It is 28.3 miles from the main gate of Glenview NAS to the Armory. The Armory is located on the southeast side of Chicago and is readily accessible from the Dan Ryan Expressway. Probably the most direct route by automobile from the main gate of Glenview NAS is:

1. Proceed to stop sign at Greenwood Avenue.
2. Turn left and drive south to stop light at Lake Ave.
3. Turn left and drive east to Edens expressway (I-94). You may enter expressway by making a right turn just beyond stoplight.
4. Edens expressway runs into John F. Kennedy expressway which in turn becomes the Dan Ryan expressway. Route is now I-90 & I-94.
5. Remain on Dan Ryan expressway and stay in the "express lanes" at about 26th Street.
6. As expressway heads southerly at about 31st Street, stay to right hand lanes where you will notice a sign stating that the next exit is 51st Street.
7. Exit expressway at 51st Street. Stay in left hand lanes when exiting. Turn left (easterly direction).
8. Travel approximately 1 1/4 miles to Cottage Grove Ave. (800 east). You will see the Armory on your right (south) about one block. Turn right. You may park your car along the east side of the building. Please lock your cars and do not leave any valuables exposed to view. (The above by courtesy of Pete Sotich)

#### FAI INDOOR REPORT

##### One Gram Model?

The reports from the 1970 Indoor World Championship have all contained comments relating the possibility that specifications for the 65 cm international class model might be changed. Although it doesn't work that way, it is possible that the specifications could be changed at the Fall CIAM meeting. The first step toward this goal has been taken; two proposals were circulated recently to the FF Subcommittee for comment. One was a Romanian proposal to limit rubber weight to one gram and require the model to weigh at least one gram. A second proposal came from Italy, suggesting that the rubber could weigh no more than the model.

The news about the proposals came too late to permit an investigation about their status, but my "educated guess" is that only that proposal considered most favorable by members of the Subcommittee will actually make it to the agenda. Final vote would then come at the CIAM meeting, and a favorable vote could be implemented one of two ways: immediate adoption and applying to the 1972 World Champs, or some form of delayed adoption.

Meanwhile, there has been considerable discussion of the one g model/one g rubber concept here in the U. S., and INAV will be open for pro and con comments on this matter. However, all interested fliers should immediately send their views to Box 545, Richardson, Tex. 75080. The "votes" will be tabulated and passed on to Dave Linstrum, the U. S. Subcommittee member.

To lead off the discussion, Jim Richmond makes these comments against the proposal:

1. I like the basic pure simplicity of FAI Indoor flying as it exists, and the freedom to strive for ultimate performance.
2. I am basically opposed to any unnecessary rules or complications. I think this tends to discourage people who might be interested in participating and it certainly complicates the job of processing during competition.
3. I question the ability of a one gram weight rule to help Europeans with their wood problems. It might help initially, but the excess weight would soon be used for the addition of technical devices to enhance performance (I have a few in mind already). That could be interesting but the wood problem wouldn't go away.
4. Instead of changing rules why not help the wood problem with a direct solution? Two NIMAS members (names have been omitted, since there was not time to check with them about release of this information) have a program under way to make good wood available to those who need it. The only real wood problem is availability of quality lumber, and this approach would seem to be ideal. (Editorial comment: My understanding of the balsa wood supply situation is that it is a complex problem, and Jim's approach may be overly simplified. This is an avenue to explore!)
5. I see no purpose in having any restriction in rubber weight.

Some other fliers were invited to comment on the proposal, but none have yet responded. This space is open to further comments - please keep them reasonably short and to the point. Meanwhile, the remarks below will show that

I have mixed feelings on the matter.

1. **Esthetics:** Some of the grace and beauty and much of the total performance potential would be lost by a change to a one gram model, as was the case in changing to 65 cm.
2. **Practicality:** The one gram model is far more practical and travel-worthy than any unlimited model. Also, the availability of suitable wood for unlimited models is becoming less and less; thus the new rule will allow a less stringent choice of material.
3. **Challenge:** Contrary to some opinions, the challenge of the proposed model will be considerably greater, and a truly champion competitor will be an excellent craftsman and a very clever designer. Further, he will spend twice as much building time per model and perhaps 100 times as much time in study of rubber and choice of suitable rubber (loop length and cross section will be far more critical). Within two years, detailed flight profiles and performance analysis will become necessary.
4. **Officiating:** As a CD, I see little technical problem in processing all models each round - essentially negligible in comparison to other FAI events.
5. As a competitor, I don't object to rules that everyone must fly under, but I tend to dislike the concept of any processing. The need for checking my work somehow seems to reflect on my honesty. However, adoption of maximum rubber weight will effectively remove me from any serious competitive effort, due to present commitments on my time.

REMINDER: Send your votes (see above) immediately!

#### CONTEST CALENDAR

NEW YORK - Long Island. Cat. II indoor contest at Cantiague Park, Hicksville, L. I., Sept. 27, 1970. Site is 190' dia. dome, 50' high. HLG, Easy B, Indoor Stick, Paper Stick, Scale. CD - Bill Dunwoody, 985 Ft. Salonga Rd., Northport, L. I., N. Y.

TEXAS - Wichita Falls. Class AAA meet with FF, Combat and Rat Race PLUS Paper Stick, Indoor Stick, HLG and Scale, July 3,4,5, 1970. The indoor events are to be held in the evening on July 3 and July 4 in a new 76' domed coliseum which appears to be an excellent site. Contact Sam Casey, 3900 Gayle, Apt. B, Wichita Falls, Tex. 76301.

WASHINGTON - Seattle. Model Aeronautics Scholarship Contest with FF, Rocket (NAR not AMA), U/C, RC and Indoor. Indoor events - HLG and Easy B. Sponsored by Boeing Management Association, Boeing Aircraft, P. O. Box 3999, Seattle, Wash. 98124. For details of indoor site: Jim Walters, 240 SW 184, Seattle, Wash. 98166 June 20-21, '70.

#### RECORDS? MAYBE!

The following records should have been listed in the May '70 issue, and have already been homologated; they were set in Willis School (20') in Hampton, Va.:

Open FAI Cat. I FAI - 20:37, Bob Platt  
Open Indoor Stick - 21:06.2, Bob Platt

RECORD CHALLENGE CONTEST, May 30-31, 1970, Cat. I (20')  
Open FAI Cat. I FAI - 20:49.6, Tom Vallee  
Open AMA Cat. I FAI - 20:35.8, Tom Vallee

#### TOP TEN CEILING DODGERS

	Time/ceiling	Fudge	Est. Altitude	Score
		(to 35')		
1. Stan Chilton	1115/35'	1.00	33'	1115
2. Tom Vallee	810/20'	1.32	19'	1068.2
3. Hal Crane	682/20'	1.32	19'	850.2
4. Dick Hardestle	602/23'	1.23	22.5'	743
5. Hewitt Phillips	528.2/20'	1.32	15'	698.7
6. Howard Haupt	456/22'	1.26	15'	575
7. Harry Cook	471/26'	1.16	24'	546.5
8. Jim Davidson	280/13'	1.64	9'	459
9. Richard Sironen	308/37'	.972	33'	396.6
10. Roger Schroeder	239.5/15'	1.53	13.5'	365.9

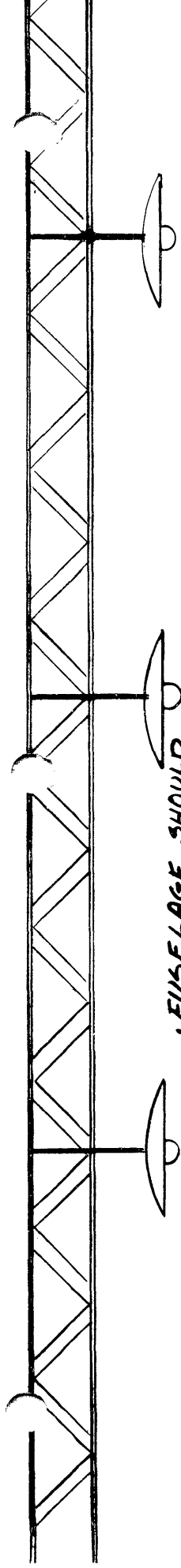
#### STATE OF THE ART

Instead of a formal plan for State Of The Art, this month we have specific information about low ceiling HLG. John Thornhill responded to a recent INAV plea for more HLG information by interviewing Dan Belieff; the result is the presentation on page 3. Thanks to both Dan and John!

#### HINTS AND KINKS

##### Condenser Paper Hint

Numerous methods have been advanced to avoid warps in models covered with condenser paper, and Jim Walters adds another: "After drying the paper in the oven at 150-200°

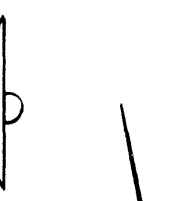


• FUSELAGE SHOULD BE CUT FOR STRAIGHT GRAIN FOR EVEN FLEXING, THE GRAIN OF WOOD SELDOM FOLLOWS THE EDGES OF BALSAM SHEET

WING SUPER-LIGHT "C" GRAIN "A" OR "B" IS NOT RIGID ENOUGH TIPS MUST BE PAPER THIN

TOTAL WEIGHT SHOULD BE ABOUT EQUAL TO A NICKEL

• FINISH IS IMPORTANT SAND SLOWLY AND WITH CARE TO AVOID WARPING THE PARTS, RE-SAND AFTER A WEEK, MOISTURE IN THE AIR RAISES A "HAP" THAT CAN BE REMOVED FOR A SMOOTH FINISH



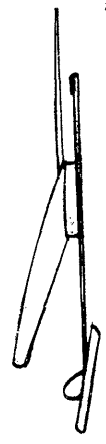
• LEARN TO STAND IN ONE SPOT ON THE FLOOR, SO THE SHIP CAN BE THREADED THRU THE OBSTRUCTIONS ON OFFICAL FLIGHTS TO GET THE BEST FROM THE SITE

• TAIL SURFACES SHOULD BE SMALL A CATI GLIDER COULD HAVE A RUDDER THE SIZE OF A DIME

• FULL SIZE PLANS FOR THIS AND OTHER CATI SHIPS CAN BE HAD BY WRITING DAN BELIEFF 306 GRUNTHUR AVE ROCKVILLE MD. 20810

• USE WHITE GLUE THRUOUT SOLVENT TYPES WILL WARP AND PULL SO THAT THE SHIP WILL NOT HOLD TRIM BETWEEN SESSIONS

DC. MAXECUTERS



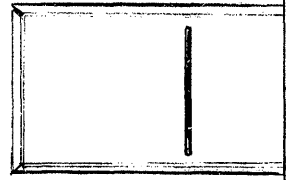
• THE TRIM IS BEST WHEN THE SHIP SLOWS DOWN ALMOST TO A STAND STILL. SO SLOW THAT ANY TURBULENCE WILL UPSET THE SHIP

• THE LAUNCH STRAIGHT UP WITH "ENGLISH" A LOWER ANGLE PUTS MORE STRAIN ON THE WING. NO WRIST ACTION PLEASE!



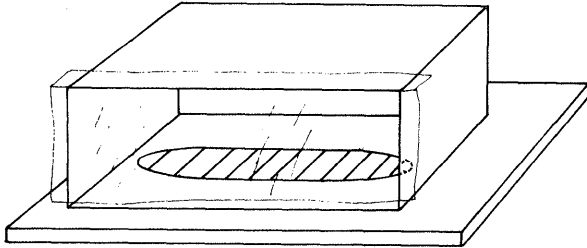
RIGHT. RIGHT PATTERN FOR

**WELCOME TO CATI HLG**  
DAN BELIEFF



for 5-10 minutes, iron it (medium heat) between the folds of a heavy-duty Scott paper towel. This gives a uniform waffle texture which seems to provide good expansion under dry-hot conditions."

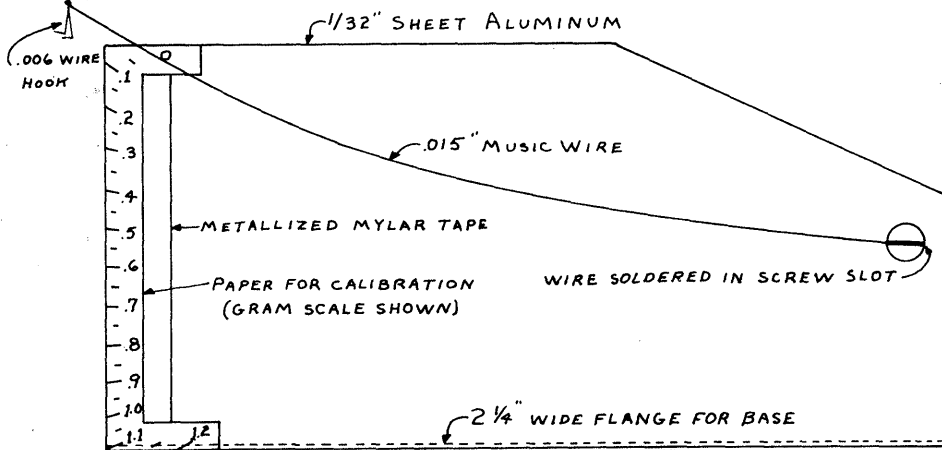
Jim's hint is perhaps the simplest to implement, and is probably as effective as any other method to allow for moderate variations in humidity. However, condenser paper is a strange beast, and quite treacherous toward the unwary builder. It is safe to say that condenser paper is likely to warp your models unless it is applied while it is less humid than it will ever be again. To this end, I have had good luck by covering inside a "hot box" set up for that purpose. First, I place a heating pad on the work area, covered by a single sheet of cardboard. The work area is then covered by a box with one end open, but with a plastic curtain closing the gap. A heat lamp and thermometer/hygrometer combination monitors the conditions in the box, and both the surface to be covered and the paper cut to approximate size is placed inside the box. After 20 or 30 minutes, the box will reach about 110° and 5% to 10% humidity, and the part can be covered by lifting the edge of the curtain to work. For some reason, our house seldom gets below 50% humidity, but this method has never failed me yet. This box is a small price to pay for the results gained!



The plastic can be from any source - for example, the bag used by dry cleaners to protect clothes is good, if it is used single thickness. It is flexible enough that you can work behind it easily.

#### Simple Scale

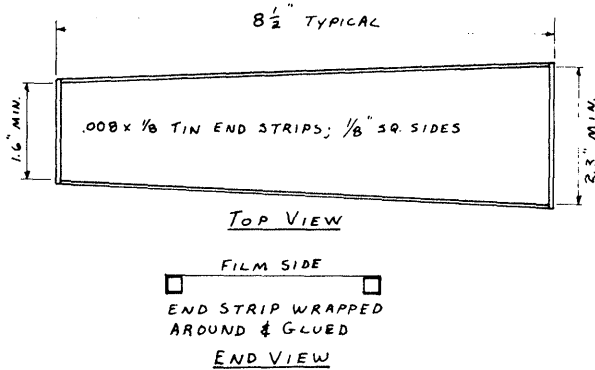
Jim Richmond submitted the scale design shown below, which was patterned after ones used by the Czech team at the 1968 World Champs in Rome. Although this is not a new idea, it bears repeating. This type of scale is as accurate as you make it (typical with most indoor scales) and indefinitely repeatable to that same accuracy. It is also capable of being packed in small spaces and rugged enough to be dependable in the flying site - which can't be said of most scale designs. Note that this design has a "mirror scale" similar to precision laboratory meters; this is done by using metallized mylar tape adjacent to the scale. In practice, you align your eye so the pointer appears to cover its reflection in the "mirror", and thus errors due to parallax are eliminated. If you are really finicky about weights, make a second spring for the other side of the scale, using smaller wire. For example, .008" diameter wire would be about 4 times as sensitive (full scale deflection of .3 grams), and would permit greater accuracy in weighing lighter parts.



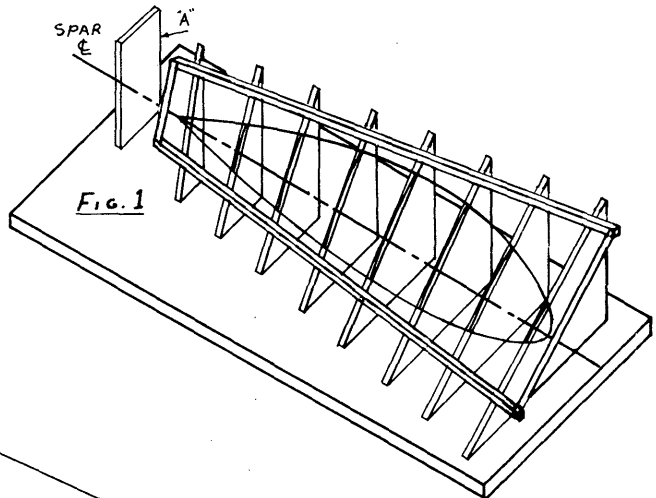
#### Prop Covering Hint

Indoor props remain the hardest component to cover, because competitive weight props are flexible and easily distorted, and because microfilm is basically a planar surface like paper. Therefore, it is ideal to have the prop on the building block or jig while it is covered and until the covering has "set", or until the prop is dry.

A simple framework with flexible ends, sketched below, enables this to be done easily. The side pieces of balsa are held joined by narrow pieces of tin can stock (Jim Clem, from years of experience building speed model tanks, says that Budweiser cans have the thinnest metal of any available cans) which are bent around the end and held by epoxy or numerous coats of glue.



To cover a prop, the gadget is first covered with film by using rubber cement to attach the film. Then the prop is laid on the building jig and spot-glued at the tip to hold it steady. Moisten the outline and the ribs using a fine brush. Pin the lower edge of the gadget just below the trailing edge of the prop as shown below, then lay the upper edge of the gadget against the prop and pin it down. Blow on the film to insure it touches the blade outline and ribs every place it should, and let the blade dry for at least an hour. There will be fine wrinkles in the covering, but these can be minimized with heat from a small soldering iron if you wish. If you do this, do it while the blade is still on the jig.



# The SYMPO '70 Report



NFFS

## MINIMIZE YOUR RATE OF SINK

By correlating test results on 21 Nordics, Peter Allnutt and Ken Kaczanowski have developed a relationship between basic airfoil parameters, aspect ratio, and rate of sink. Use it to get the best wing design for your next model. -- John Krouse helps by presenting the effect of undercamber on endurance. -- Hank Cole rounds it out by determining the effects of Reynolds Number on rate of sink and presenting a simple test for determining whether your aspect ratio is the optimum one for your Reynolds Number. -- Finally, Hewitt Phillips discusses experimental methods for determining the L/D of models and presents some test results obtained with radio controlled gliders and with free flight models.

## MAXIMIZE YOUR RATE OF CLIMB

Bob Meuser presents a paper on choosing the best Wakefield propeller that is a classic. It answers virtually all of the questions you've had on P/D, diameter, no. strands motor run, etc. -- Dave Mendel's paper makes it easy to find the best prop for your power model, be it FAI Power or R/C (e.g. 8,000 rpm). All you have to do is to use his graphs with their illustrated examples. He also shows how much altitude suffers if your climb path is not vertical.

## HOW TIGHT A TURN AND HOW BIG A VERTICAL TAIL

Peter Soule shows what happens to your rate of sink as a function of bank angle in a coordinated turn and tells you how to minimize your altitude loss during a turn when you are heading the wrong way and have run out of altitude. -- Bill Bogart correlates the vertical tail volumes and dihedral of Nordics, Wakefields, and FAI Power models, shows how to use the data for designs, and explains what happens to a model in a steady state turn and why.

## WING STRENGTH AND STABILITY IN PITCH

What's the best structure: D-Box, sheet on bottom, multi-spar? What happens to torsional and bending stiffness as wood size and type of structure on a Wakefield wing is varied? Don Goldberg has the answers for you. -- Hal Crane comes up with an even simpler approach (than the one in Sympo '69) for locating the neutral point and fixing your c.g.

## THE OPTIMUM INDOOR MODEL

Walter Erbach uses a computer to evaluate the effects of tail size, wing position, and c.g. position on power required. There is an optimum c.g. position for each tail size. -- Bob Platt developed an equation for the power required as a function of average chord, and using it, he calculated the optimum chord for an FAI indoor model. His latest model, based on these results, has already broken two low ceiling records.

Order yours today. It contains twelve outstanding papers plus the Ten Free Flight Models of the Year as selected by NFFS, including three-views and background data.

Detach this coupon, fill in and mail to Annie Gieskieng, NFFS, 1333 So. Franklin St., Denver, Colorado 80210. Check or money order should be payable to NFFS. Price: \$3.50-NFFS, AMA member, \$4.50 non-member. \$6.00-'69 and '70 reports, \$8.00-'68, '69, '70.

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# INDOOR

## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

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

### New Members!

H. LEWIS MERTON, P. O. Box 703, Ft. Rucker, Ala. 36360

### Change Of Address

STEPHEN FAUBLE, 714 N. Jefferson Ave., Dixon, Ill. 61021

### Nats Info - SPECIAL NOTE

The announcement in May '70 INAV that indoor registration could be done at Glenview NAS on Sunday, Jul. 26, 1970, was in error. No contestant access to the base is possible before Monday, July 27, 1970. Therefore, please read the following memo supplied by AMA HQ carefully:

Special arrangements have been made to permit advance entrants (those who postmarked Nats entry forms to AMA HQ no later than June 22) to register and have certain problems taken care of at the Indoor site as follows:

#### 1. Monday, July 27, 9 am to noon.

- Nats registration (officially check in, obtain Nats identification and contestant information kit). This is necessary before any official flying takes place.
- Housing Priority. If your copy of the entry form indicates you have such priority, you may claim it.
- Navy Meals. Tickets for same may be purchased.
- Add Events. These may be entered and paid for.
- Entry Discrepancies. Any money or entry form problems, indicated by "report to desk P" notation on entry form.

#### 2. Tuesday, July 28, 9 am to noon.

- Nats Registration only, as above. No housing, meals, or event problems can be taken care of at the indoor site on Tuesday.
- Entry discrepancies, as above.

Note: Noon is the cutoff time on both Monday and Tuesday. HQ workers who will provide these services must be at Glenview NAS by 2 pm each day.

### Indoor Scale

The June '60 MAN had plans for a direct reading indoor scale which was sensitive to about .0001 oz, with .05 oz full scale reading. Fred Harlow, 9724 Royerton Dr., Richmond, Va. 23228, will construct and calibrate these scales to order for \$10 each. This sounds like a good price!

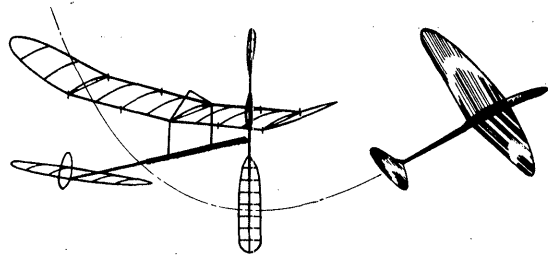
### FAI INDOOR REPORT

#### One Gram Model?

Last month we began this topic with a recap of what had been reported on the possibility of FAI Indoor models being required to weigh one gram, coupled with a maximum of one gram of rubber. Comments by Jim Richmond followed, along with my own comments. Readers were invited to send their comments also. At this point, certain observations can be made:

1. Many, but not all fliers agree that scarcity of wood usable for .5 g to .6 g models (the present competitive standard) is very great. It is easily demonstrated that this wood is scarce, and the proportion of top-notch wood to lesser wood in any shipment is very low. This is not surprising, because the final distinction between good wood and almost good wood only turns up after you build the motor stick (the most critical part) and it breaks on less than full turns. The one gram limit would relieve this pressure on supplier and builder alike.

2. Some comments took the stand that the one g rule was surely intended to make it easier for inexperienced fliers



to win. No proponent of the new rule has said this, and the idea is quite mistaken. The only way to "legislate" newcomers into the winner's circle is to prevent more experienced fliers from flying against them! What has been advanced is that more newcomers are expected to be drawn into the event. Although this may seem like splitting hairs, the distinction is not all that subtle. The reason more newcomers are expected is that a one g model is more "believable" for those who are attracted to indoor models but are unwilling to operate for several years at a 2:1 or worse weight disadvantage. They are also reluctant to buy substantial amounts of specialized supplies even if they feel competent to build the lighter models; this reluctance tends to disappear as they get more experience.

The comments will begin with one by Andras Ree, of Budapest, Hungary, and currently the leading flier from that country:

"During the W/Ch we spoke very much about the necessity and possibility of new FAI Indoor rules. Fliers from 4 or 5 countries spoke about the problems and their suggestions. I'll try to summarize the main problems as I see them:

- There are no good young fliers (about 20 years old). The way to the top is very long and the number of newcomers is very low.
- There is a great distance between a few top fliers and others in most of the countries.
- Good materials (balsa and rubber) are not equally available, or are not available at all.
- The models are too breakable under 0.7 g.
- Transportation of very light models is dangerous, and 6 or 8 models requires a very big box.
- Flight times are too long. This causes problems for the organizer, and we have much chance to hit the wall.
- To get good sites is very difficult.

I think the aims of possible new rules must be:

- Middle class balsa must be suitable, to equalize possibilities of supply for all fliers.
- To get more newcomers.
- To make stronger models with less transport hazard.
- To reduce the flight times considerably.
- The models must remain "indoor" models.
- The rules must be as simple as possible, and processing must be easy.

I think these objectives would make indoor more popular. There were a lot of suggestions to realize these aims. One was 65 cm span, one g minimum weight of model, and one g maximum model weight. Another was 50 cm span, 0.7 g minimum model weight, maximum rubber weight 0.7 g.

My opinion is that we must not limit rubber weight! There are big differences in rubber quality available, and indoor fliers are not rubber makers. We can only choose from what we can get, so the direct rubber limitation is a big advantage to those who can get good rubber. So, my own suggestion is: 50 cm span model, 0.75 g minimum weight, 20 cm maximum distance between motor hooks, maximum prop diameter 35 cm, and no gears or double motor permitted.

The 0.75 g (50 cm) model needs only middle class balsa, while the other points limit the Rubber only indirectly. The models would be stronger, the boxes smaller, and four models would suffice for a big contest. Smaller models, lower flight altitude and shorter flights would make the sites relatively larger and more suitable." (Ed. note - Pete Andrews and C. V. Russo flew one g models at a recent Lakehurst session. Times approached 30 minutes on a day when Pete's top time with a standard FAI was 36 minutes. These results tend to discount the possibility of greatly reduced flight times with heavier 65 cm models!)

In addition to the above, Boyd Felstead (Australia) is not in favor of the new proposal, primarily because of an increase in time required to process the models. And from Austria, Manfred Koller indicated that he would expect an increase in indoor activity with such a rule. (Austria did not have a representative at the '70 W/Ch since Manfred was unable to go and Walter Hach was unwilling to go alone.) It is interesting to note that Boyd Felstead can



be considered to be the originator of the 65 cm model, as he suggested it in the Dec. '62 INAV.

Other comments have been received from U. S. fliers:

**Tom Vallee:** With regard to weight rules (for FAI), I'm 100% against them, for these reasons:

1. I like the freedom, the wide variety of approaches now available to reach ultimate indoor performance under the present rules.
2. Only too often, rules meant to aid the average flier (like the 65 cm span), only confound and discourage these average fliers and increase the gap between him and top competition. The proposed weight rules represent a real challenge and would widen the gap. This would be harmful to the sport. (Ed. note: Felstead's original comments cited easier transportation, smaller sites required, less flight time - which didn't prove out!, and a bigger challenge due to smaller wing area. Whatever the reasons for adopting 65 cm, Boyd made no mention of average fliers as a reason for suggesting 65 cm models!)
3. I agree 100% with Richmond that there is no logical purpose in restricting rubber weight.
4. Poor wood supplies in Europe is the only logical reason for a model weight rule. Even so, the lightest models at the '70 W/Ch were European models.
5. Rodemsky's outstanding performance with very heavy models suggests it is possible to be competitive with a heavier model.
6. I think the rule proposal is partly due to reaction to heavy model destruction at the W/Ch. Heavy models would have been in as much trouble in the salt mine, especially if they had insufficient power to punch through low level turbulence.
7. If we must have weight rules, why not adopt a 1.5 g, 75 cm model with a limited motor stick length and ban multiple motors and gears. This model would be easier for newcomers to fly, if there were no rubber restrictions.

**Pete Andrews:** I personally will go along with any rule with the idea that the ability and experience of good builders will put them consistently on top. However, any restrictions on model and rubber weight will not solve existing problems and will create a few, particularly in contest processing.

**Lew Gitlow:** The only change in the FAI rules that I would favor is to require a minimum rubber weight of .035 oz. This would encourage one to build a little heavier, without going to extremes. I agree with all the reasons in June '70 INAV against change. The above would be at best a compromise. If the change is made, the processing of both rubber and model, probably both before and after each flight, would be enough to discourage me from competition.

I feel that modelers will always want the best available balsa to work with, whatever the wing loading. The availability of good balsa would admittedly be made easier by working with 5.5 to 6.5 lb./cu. ft. balsa. But it is questionable that modelers would use the heavier wood even if the wing loading was increased!

In my opinion, there is much more to be lost than to be gained by change, and I would hate to see change occur without a popular majority vote, after the pros and cons are brought to the attention of all concerned, and after at least 2 years of discussion and experimentation. Let's not ram-rod change!

**George Honda:** If the rules go to size and weight just to make it easier - I think it is the wrong way to go. It did no good in either FAI Gas or Wakefield! You will just kill the event as it is and make it like slot cars or model railroad. Just to justify more contestants, you get mediocrity, not skill.

**Curtis Janke:** Don't be too cheerful about the difficulty of processing by weight. There are always drafts, so some sort of box would probably be required, with the attendant dangers of damage.

Other problems: great difficulty in getting just the right amount of weight of rubber and lube in the right length of loop. Good rubber is at a premium, and should not be wasted by such experimenting. Also, the emphasis on good rubber would be increased, until it is likely that rubber supply would be an even greater problem than the present wood supply. It seems unlikely that Europeans can get good rubber any easier than good wood!

Besides that, I doubt that the wood quality is that important anyway. Reasonably good wood, if properly used, results in a good ship and the extra weight doesn't show up that glaringly on the watch anyway. I can remember Carl Goldberg beating me and everyone else repeatedly, well into WWII, with a heavy and aging airplane he built in 1935! Remember how well the fellows with reed sticks and booms did at the early Cardington meets? I for one probably would drop all FAI interest if such a rule went

through, though I would not object to a further decrease in span. (Though even that must stop somewhere!)

Finally, Hal Crane offers an alternate proposal, with progressive approach to the final formula (coded by year):

- 1972 - Model equal to or greater than one g; rubber unlimited or 1.5 g maximum.
- 1974 - Model unchanged from 1972; rubber to weigh no more than model.
- 1976 - Model unchanged from 1972; rubber equal to or less than one g.

Manny Radoff also suggested an alternate proposal: Limit the total rubber weight to 1/2 g, with no other restrictions on the event.

Last month we requested that all comments be sent to INAV, so the above remarks could be extracted before they were forwarded to Dave Linstrum, the US member of the FF Subcommittee of the CIAM. Please forward any further comments directly to Dave at 12 Holcomb St., Simsbury, Conn. 06070. Dave will soon formulate an official US position, looking toward a final vote in late Fall.

#### POSSIBLE WORLD RECORD!

Andras Ree made a contest flight in Budapest, in a 14.9 m site. The flight conformed in all respects to FAI World Record procedures, so the 27:58 flight has been sent to the CIAM for evaluation. The present Cat. II World Record is held by Jiri Kalina, and was set with a 90 cm model during the time that FAI ceiling categories were on provisional status (summer of 1966).

#### INTERNATIONAL CONTESTS

CZECHOSLOVAKIA - Brno. Third Brno International Contest, July 11-12, 1970. The site is the big international pavilion, site of the Czech Nats.

HUNGARY - Debrecen. The second Hadju-Cup International Contest will be held Aug. 16-19, 1970 at the 98' social hall at Kossuth University.

#### CONTEST CALENDAR

NEW YORK - Long Island. Cat. II indoor contest at Cantigue Park, Hicksville, L. I., Sept. 27, 1970. Site is 190' dia. dome, 50' high. HLG, Easy B, Indoor Stick, Paper Stick, Scale. CD - Bill Dunwoody, 985 Ft. Salonga Rd., Northport, L. I., N. Y.

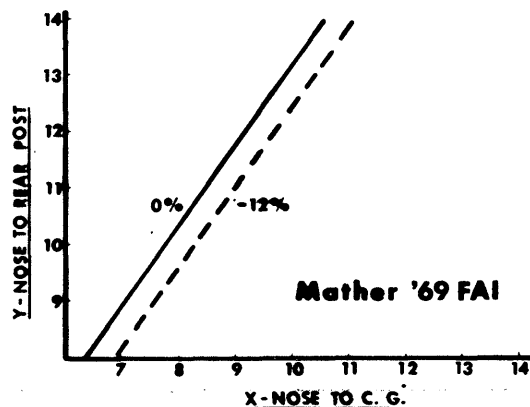
#### STATE OF THE ART

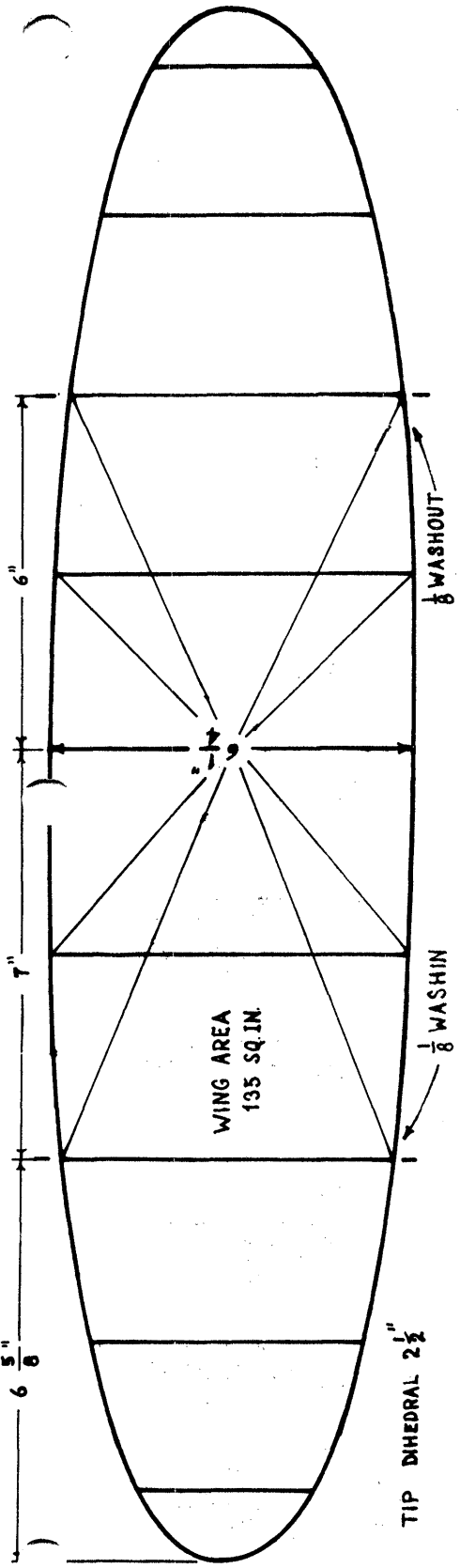
The model for this month is by Clarence Mather; the model which he used to qualify for the 1970 W/Ch. It is modified from his earlier design (Sept. '67 INAV), and is described in his remarks below:

"I went to the curved wing outline when straight spars bowed in during covering. I tried motor sticks up to 16" long, but could detect no performance advantage and went back to 12".

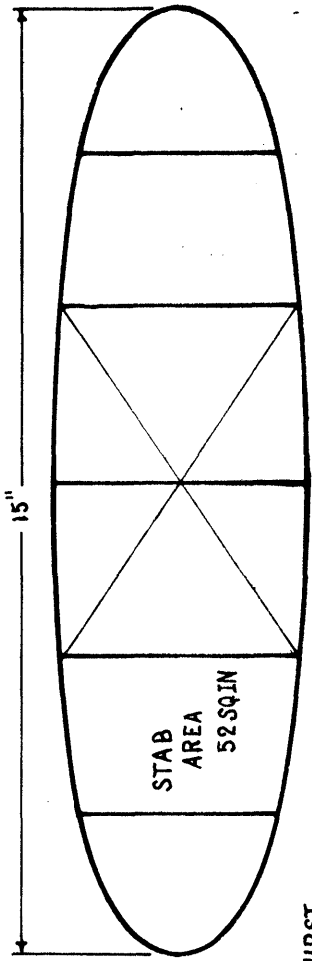
Originally the CG was at 80% and the models flew, but they were touchy - a little more power and they would stall repeatedly. With the CG at 70% they seem much more stable. (Ed. note: with CG as drawn, the model is flying at -12% margin, so quite likely the model is quite close to maximum trim sensitivity.)

I had a lot of problems at Lakehurst finding the right combination - on my longest flights the model dead-sticked at some altitude so I feel it is capable of considerably more time. A longer motor (18") of the same rubber broke, and it was the last I had of that size and batch."



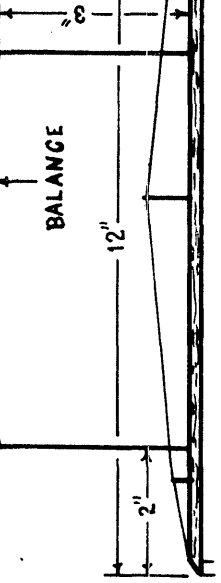


WING  $4\frac{1}{2}\%$  ARC  
FULL SIZE AIRFOILS

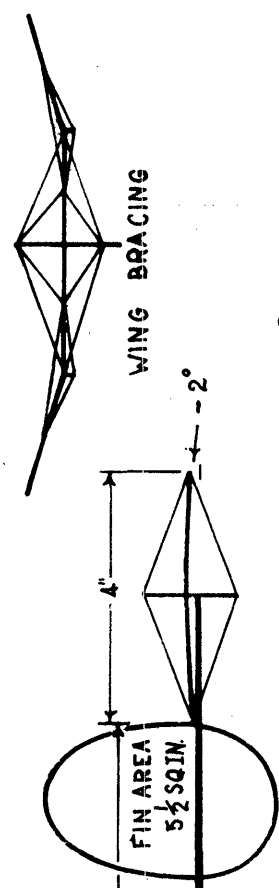


STICK-TAIL .012 OZ.  
WING .006 OZ.  
PROP .004 OZ.  
---  
.022 OZ.

BEST TIME - 32" LAKEHURST  
1480 TURNS - .045 X 14" PIRELLI



$\frac{2}{16}$  ID. STICK - VEE BRACING



1969 FAI MODEL

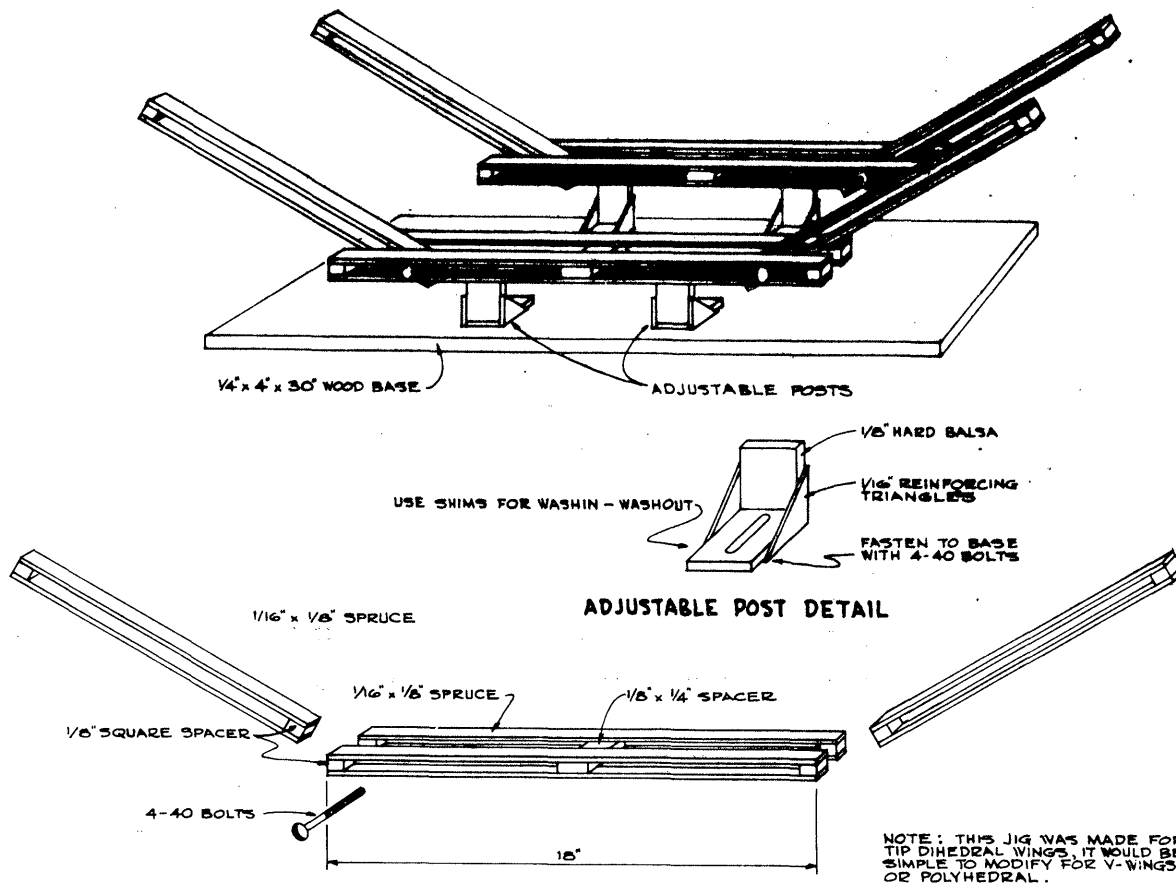
C. Mather

SAN DIEGO  
ORBITEERS

18/34 PROP ACTUAL BLADE SHAPE

AIRFOIL

1" S" RUBBER HOOK



## THE VARIABLE DIHEDRAL - CHORD - WASHIN - WASHOUT WING BRACING JIG

BY PAT PERCIVAL - LAKE ERIE MODEL CLUB

### HINTS AND KINKS

#### Good Records Are Useful!

An interesting keynote of many of the most successful indoor fliers is their system of record-keeping. It has been noted that lightweight construction depends heavily upon detailed records of the weight of each part of our models; when you manage to build a part so light it breaks in routine handling, you have then discovered your own building and handling limitations. The record of weight for that part is then the guide to building one just about right next time!

Detailed flight records are also essential to consistent model performance. Hal Crane is perhaps the one most consistent Cat. I flier, while Jim Richmond has things his own way in Cat. II and Cat. III. Since their style of flying is entirely different, it is interesting to note which items of model performance they each find important to make note of.

Hal flies heavier than usual models that ceiling-scrub during much of the flight. Besides noting which prop is used on which model for a particular flight, he also keeps the following information: Loop length and cross-section of rubber, rubber weight, model weight, turns and torque at launch (including how many turns were put in and how many turns were backed off), turns left at landing and the torque level at landing. Finally, flight time, number of times model was steered, and average RPM are recorded.

On the other hand, Jim Richmond's models rarely touch anything in flight; in fact, some of us privately wondered if his very lightweight models would hold together if they did hit anything. All doubt was removed when he set the 33:20.5 record in Chicago's Washington Park Armory. This was one of his lighter models; it seemingly tried to remove every light in the place and continued to fly with a large hole in the wingtip. Nonetheless, this isn't the way he usually does it, so he records the following for Cat. III flying: Model and prop, flight time, maximum

height reached, turns in and backed off, rubber dimensions and weight, and reasonably detailed comments about flight adjustments, general performance, and flying conditions. Absent from the records he furnished was torque info; he commented that for Cat. III you wind it up all the way!

#### Adjustable Wing Jig

The sketch above is a wing bracing jig design by Pat Percival. The sketch is largely self-explanatory, and can fit a large number of different model designs.

### INDOOR ELSEWHERE

#### England

Cardington has been opened for monthly sessions, and the first session found Laurie Barr leading the pack (65 cm fliers) with 23:55. Several other fliers also turned out, including Ron Draper. Ron had his 40 minute model (still in good shape from the '62 W/Ch), which he had to balloon after 25 minutes to keep it out of the top.

#### Hungary

The Hungarian National Championship was organized at an earlier date than usual, and bad weather outside messed up flying conditions for the first 4 rounds. Two flight totals for the winners were: (Kossuth Univ., Debrecen)

1. A. Ree	53:57	4. I. Soltesz	31:56
2. A. Egri	46:18	5. G. Varszegi	31:51
3. Gy. Buzady	33:43	6. Z. Ocsody	29:44

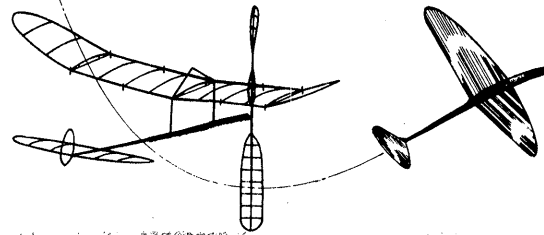
A new challenge cup contest was organized in Budapest, in the 14.9 m hall at the Politechnical University, and the conditions were better. The winners:

1. A. Ree	53:48	4. Gy. Buzady	30:37
2. A. Egri	44:01	5. G. Varszegi	26:39
3. K. Biro	42:01	6. Z. Reti	19:04

# INDOOR

## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080



### Indoor Stick

#### Junior

1. Tom Sova	18:26.1
2. William Schlarb	11:05.0
3. Bruce Pallet	10:47.0
4. Michael Kuehne	10:43.1
5. Barry Pallet	9:34.0
6. Michael Parykaza	9:19.4

#### Senior

1. Jan Serviates	14:45.0
2. Ronnie Ganser	14:09.8
3. Terry Kuehne	13:19.6
4. Jeffrey Annis	12:27.0
5. Susan Weisenbach	12:25.0
6. Dale Hacker	10:58.0
7. Dan Domina	8:36.7
8. Richard Hixon	8:18.3

#### Open

1. Jim Richmond	34:33.8
2. Clarence Mather	30:44.0
3. Ron Plotzke	28:14.2
4. Dan Belleff	26:55.6
5. Manny Andrade	25:08.0
6. Ron Ganser	23:09.7
7. Ed Stoll	22:51.0
8. Paul Tryon	22:35.4
9. Al Rohrbaugh	22:37.5
10. Wayne Zink	22:16.4

### Paper Stick

#### Junior

1. Barry Pallet	10:37.1
2. Tom Sova	10:26.8
3. William Schlarb	9:47.8
4. Michael Kuehne	9:06.5
5. Steve Bandt	8:57.0
6. Kim Mather	8:08.6
7. Bruce Pallet	7:16.0
8. Timothy Noonan	7:09.4
9. Jason Tryon	4:44.0
10. Ronnie Stransky	3:37.6

#### Senior

1. Jan Servaites	16:45.6
2. Jeffrey Annis	11:47.9
3. Richard Hixon	11:30.1
4. Susan Weisenbach	11:29.2
5. Dale Hacker	10:32.2
6. Dan Domina	10:20.7
7. Ronnie Ganser	10:02.5
8. George Pharr	8:00.0
9. Terry Kuehne	7:24.0

#### Open

1. Jim Richmond	21:34.2
2. Al Rohrbaugh	20:20.3
3. Clarence Mather	18:50.6
4. Ed Stoll	18:24.0
5. Joseph Sova	16:44.7
6. Charlie Sotich	16:44.6
7. Bob Clemens	16:33.1
8. Dan Belleff	16:09.0
9. Ron Ganser	14:23.2
10. Larry Cailliau	12:35.3

### Indoor Cabin

#### Junior

1. Tom Sova	11:23.4
2. Michael Kuehne	7:41.8
3. Barry Pallet	5:03.0
4. Bruce Pallet	4:55.0
5. William Schlarb	4:33.8

#### Senior

1. Ronnie Ganser	13:51.7
2. Dan Domina	13:43.2
3. Terry Kuehne	7:50.2
4. Dale Hacker	7:48.5
5. Susan Weisenbach	5:24.2
6. Jan Serviates	4:33.0

#### Open

1. Jim Richmond	20:25.2
2. Bucky Serviates	19:16.2
3. Ron Ganser	17:29.2
4. Charlie Sotich	17:19.4
5. Al Rohrbaugh	16:36.2
6. Wayne Zink	14:14.6

### Indoor HLG

#### Junior

1. Marty Thompson	118.2
2. John Lorbiecki	100.2
3. Jim Haught	89.6
4. Michael Taibi	85.3
5. Michael Kuehne	85.2
6. Brian Pardue	82.3
7. Carl Johnson	80.8
8. Rod Wilson	78.0
9. Bruce Pallet	54.7
10. Robert Sylvia	69.6

#### Senior

1. Richard Hixon	116.0
2. Paul Andrade	108.6
3. George Pharr	105.7
4. Paul Tobie	104.9
5. Dan Domina	101.3
6. Jan Serviates	99.8
7. Bobby Hanford	96.1
8. Terry Kuehne	93.8
9. Gary Price	89.5
10. Susan Weisenbach	87.2

#### Open

1. Dennis Bronco	128.6
2. Robert Watson	123.6
3. Bucky Serviates	121.4
4. Ron Higgs	119.8
5. Rudy Kluber	114.0
6. Dan Belleff	110.0
7. V. Cunningham, Jr.	107.9
8. John Sites	107.7
9. Ed Franklin	105.3
10. Joseph Macay	104.8

The 1970 Indoor Nats was held in the Washington Park Armory in Chicago, and was blessed with good entry, very good conditions, and excellent performances. A higher proportion of Junior and Senior entrants made flights than in previous years, while many Open entrants never made it to the meet.

The meet format was the same as for 1969, with rubber events on Monday and HLG and Indoor Scale flying half a day apiece. Scale models were judged during the HLG flying, and the scale flying began promptly at 3 pm. Peanut Scale and Navy Scale were again "extra" events, sponsored by the Cloud Busters club of Detroit, and Erwin Rodemsky ran PennyPlane under the sponsorship of the Chicago Aero-nuts. An excellent crew of Navy timers was on hand both days, eliminating the need for volunteer timers used at both the '68 and '69 Nats. These timers worked hard and in a very conscientious manner, and were quite interested in doing a good job. Several contestants took time to say how pleased they were, and this word was passed on to the proper Navy officials.

This year the Indoor events had a new award - Indoor Category Champion. The specifications for the award make it similar to Grand National Champion, in that the winner must have the highest championship points from indoor events (only) of any Indoor entrant, regardless of age. Each contestant must declare intent to compete for this award, and may choose any three events to be scored in. (Actually, Category Champs are allowed to compete in half as many events as are flown in that category; Indoor has only five events in the Nats so three is the maximum number an Indoor Champ can declare.) Jim Richmond became the first Indoor Champion by winning first in each of his declared events. It was noted that Jim cheated himself - his entry fee covered five flights in each event, but he used only four of the fifteen flights to get three first places!

Besides the Navy crew, meet administration was handled by Bud Tenny and Jim Perdue, with Ralph Kuenz as CD for the Scale events. The Scale judges were Al Burczyk, Al Koehler and Robert Mosher, all of the Cloud Busters. They

worked for eight hours with only a fifteen minute break to complete the judging of 56 AMA Scale models, and all the Scale fliers owe them a special vote of thanks. George Pickel and John Hatch assisted with score posting at HLG, providing a welcome relief. Thanks to all who helped!

Two or three "happenings" stuck in the mind from the day of Indoor Rubber. Jim Richmond put his Paper ship up on its second flight, and it threaded its way through all the lights and stuff, hardly touching at all to rack up a fair margin of victory. However, when his FAI was up on its flight, the timer counted 15 contacts, with one or more tailslides as it drifted half the length of the site. In sharp contrast, Erwin Rodemsky put up five officials, all of which hung. Then there was the Navy timer who came back from a timing stint convinced he was a jinx. He had timed three members of the same family; each model had hung on a light fixture, and two of them on the same one! This meet also confirmed a suspicion about the light fixtures; I had been convinced each one had teeth up there. It was discovered that the lights could be lowered and the models lifted off, so I examined one of the fixtures while it was down. Sure enough, there were several sharp vertical protrusions well suited to "eating" models!

On HLG day the fliers were there very early, before 7 am. By starting time many fliers were zeroed in, but times didn't really start to climb until about 11 am. Dennis Bronco had good times early, and was essentially in a leading position most of the day. However, the rest of the places changed several times during the day. In the Junior division, Marty Thompson posted two good ones in seven tries early, but wasn't able to help his score in later attempts. Luckily, no one came close and he held his lead long enough.

Indoor Scale held few surprises, but a few of the models were a departure from the expected entry. A Ford Tri-motor, with the outboard motors geared to motors in the wings had its problems but finally made its flights. The model was very well done, and it was the opinion of several bystanders that the model was simply too small. Ron Martelet's Pilatus Porter was obviously a model built

PennyPlane Report - 1970 Nationals

by Bob Clemens

to fit the existing rules exactly - it was beautifully constructed, but ultra-light and flew very well. The construction was perhaps typical to lightweight indoor scale, but the model was covered with Microlite which had been inked to show all hatches, movable surfaces, etc. on the real airplane. The result was greater than usual scale markings with no weight penalty. Charlie Sotich and Jim Richmond had similar approaches, with Pilatus Porter and Turbo Porter models. Thus the flying part of the rules were emphasized, to the detriment of many models with more scale features. It is possible that this will result in rules proposals to more nearly equalize the concepts of flying vs. scale; at least this is being considered.

Very little mention has been made of Navy Scale, and perhaps more should be said. The event is judged by AMA rules, but must be a model of a Navy aircraft. The trophy for this event was donated by the Cloud Busters, in order to insure continuation of the event.

Other trophies for the extra events were donated as follows: PennyPlane (very nice desk pen sets) - Erwin Rodemsky; The Golden Peanut (First in Peanut Scale) - Flying Aces GHQ; Craftsmanship (Peanut) - Bill Hannan; High Point Junior (Peanut) - Long Island Association of Model Airplane Clubs.

Indoor Scale

Junior

1. Michael Kuehne	Pietenpol	105
2. Bruce Pallet	Pilatus Turbo Porter	83
3. Michael Parykaza	Pilatus Porter	78.3
4. Marty Thompson	PT-19	77.5
5. Barry Pallet	Hello Courier	72.5
6. Ronnie Stransky	Nesmith Cougar	61.5
7. Robert Sylvia	Piper Pawnee	47.5

Senior

1. Dan Domina		115.5
2. Terry Kuehne	Pietenpol	103.5
3. Brian Webster	Eindecker	103
4. Bobby Hanford	PT-19	102

Open

1. Ronald Martelet	Pilatus Porter	172.5
2. Earl Thompson	1911 Cessna	160.3
3. Jim Richmond	Pilatus Porter	154.7
4. Charlie Sotich	Pilatus Turbo Porter	151
5. Bucky Servaites	1911 Cessna	141.7
6. Frederick Stark	DeHavilland 29	141
7. Ken Johnson	Piper Vagabond	135 1/2
8. Don Garofalow	Corbin Super Ace	133.8
9. William Patton	SE-5A	126 1/3
10. Tom Peardon	Vickers Bleriot	116 1/2

Navy Scale

1. Joseph Macay	Curtis Seagull	151 2/3
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Peanut Scale Results

1. Clarence Mather Wittman	Buster	214
2. F. T. Stark		164
3. Don Garofalow	Nesmith Cougar	140

High Point Junior

Kim Mather	134
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Best Craftsmanship

Bob Clemens	Demosielle
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PennyPlane Results

Junior

1. Tim Noonan	6:32.2
2. Chris Clemens	3:57.0
3. Michael Parykaza	3:26.0
4. Jack Tisinal	2:55.0
5. Stephen Robbins	1:59.0
6. Giff Gaynor	1:38.0
7. Kim Mather	1:16.0
8. Tom Gaynor	0:16.0

Open

1. Clarence Mather	8:28.0
2. Erwin Rodemsky	8:16.0
3. Bob Clemens	6:48.0
4. Al Rohrbaugh	6:24.0
5. Fudo Takagi (1)	6:21.0
6. Dave Linstrum (2)	6:05.3
7. Charlie Sotich	5:58.8
8. Charles Markos	5:16.5
9. Wayne Zink	5:04.0
10. Donald Wright	5:03.0
11. Jim Richmond	4:55.0
12. Dave Linstrum (3)	4:38.0
13. Patty Thornhill	4:35.0
14. John Thornhill	4:28.0
15. Bill Hannan (4)	4:25.0
16. Gene Simpson	4:16.0
17. Dave Linstrum (5)	2:42.0
18. James Noonan	0:52.0

Proxy Open Fliers

(1) Ed Lidgard
(2) Hardy Brodersen
(3) Ron Plotzke
(4) Bill Bigge
(5) Jim Jones, Jr.

Can an indoor event be highly competitive, give reasonably good performance, use easy-to-build models, and be downright fun in the bargain? If the unofficial PennyPlane event held at the 1970 Nationals is any indication, the answer would seem to be a resounding Yes!

Making its Nationals debut, PennyPlane saw 28 contestants - nine Juniors and 19 Sr.-Open - turn in a total of 117 official flights. The Chicago Aeronauts sponsored the event, with Erwin Rodemsky serving as CD and Mrs. Rodemsky sitting in as recorder. Entry fee was - that's right - one penny!

Rules were purposely kept simple. The chief stipulations were that the models had to weigh, less rubber, at least as much as a new copper penny; (this is .1 oz.) wing span or total length could not exceed 18"; the motor stick could not exceed 10 inches.

Five minutes would have seemed good duration for such a model, but it didn't take many flights to show that a well-trimmed PennyPlane could do much better than that. Erwin Rodemsky set the early pace with a 6:43 flight on his first official. His ship was conventional, and covered with white tissue. Clarence Mather, flying a ship with very short wing posts and a large diameter prop, then took the lead with 7:14. These two models, as did many others, took advantage of the lack of restriction on wing chord to use wings roughly four inches or more in width.

Duration kept improving through the second and third rounds of official flights, as the contestants got the feel of their models, most of which had not been flown under high ceiling conditions before. Air conditions were very favorable, with only light drift. However, light cords and beams began claiming some victims as more models reached the vicinity of the 90' Washington Park Armory ceiling. Most trapped ships were ballooned down without incident or serious damage.

Rodemsky's third official flight climbed right to the roof, avoided getting hung up, and came down at 8:16. This gave him the lead over Mather, who had upped his best time to 7:27. Al Rohrbaugh made 6:24 for third place, while Dave Linstrum's model, proxy flown by Hardy Brodersen, did 6:05 for fourth, followed by Bob Clemens with 6:04.

The final official flights of Mather and Clemens told the story of the top three places. Clarence put up a splendid 8:28 effort to win Open; Rodemsky's 8:16 gave him second; Bob Clemens turned 6:48 to nose out Al Rohrbaugh for third place.

In the Junior division, Tim Noonan put up a terrific 6:32 flight on his first official and was never in danger after that; Chris Clemens took second at 3:57 and Michael Parykaza finished third at 3:26.

Trophies - beautiful desk pen sets made by Rodemsky - were presented to the top three finishers in each division and PennyPlane had made a successful showing at the Nats.

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

New Members:

- BUDD CHANDLER, 46701 Frances Lane, Utica, Mich. 48087
- CAPT. JOE CHANDLER, CMR 2459 603 DASS, APO San Francisco 96570
- ARTHUR MANSFIELD, 621 Glendale Pl., Tullahoma, Tenn. 37388

Honorary Members

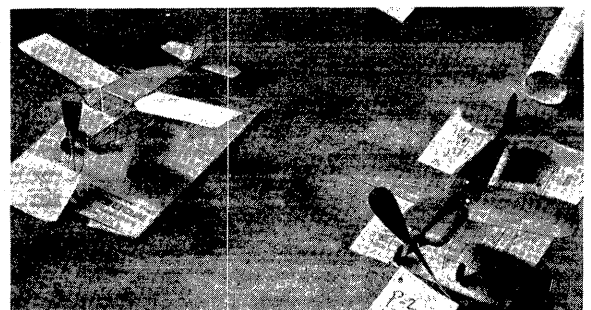
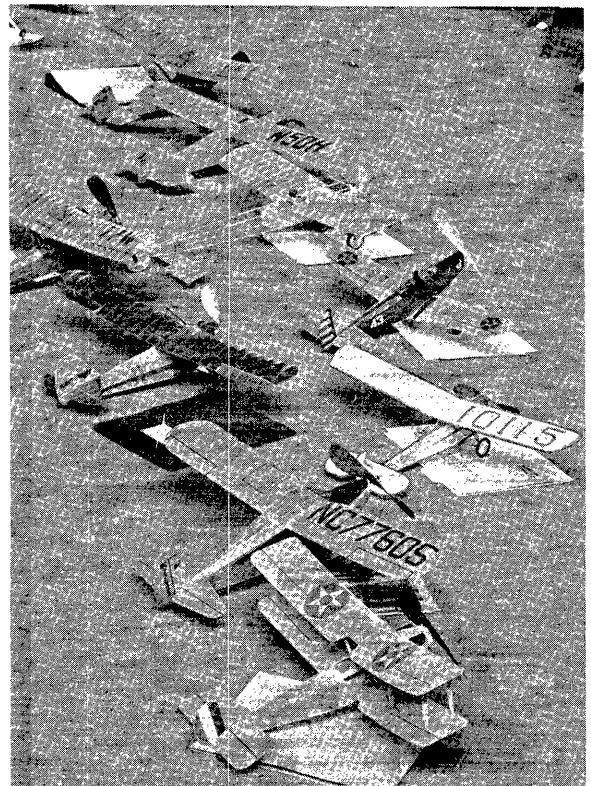
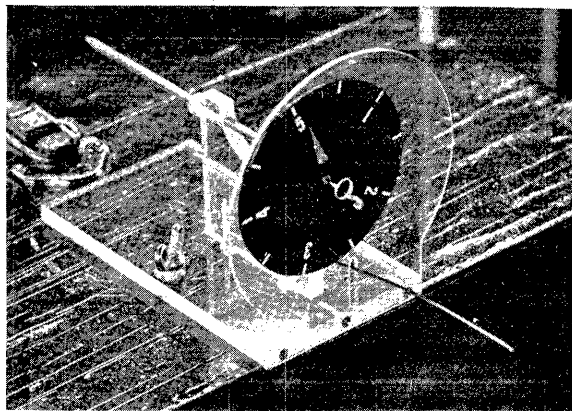
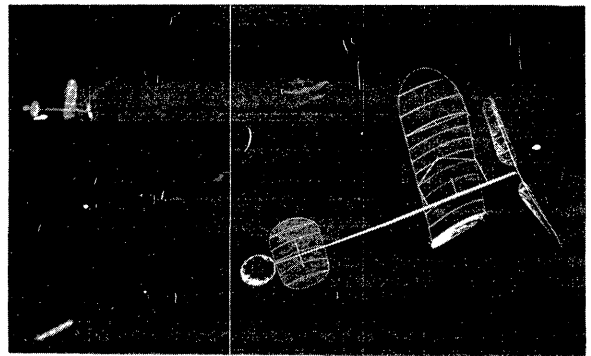
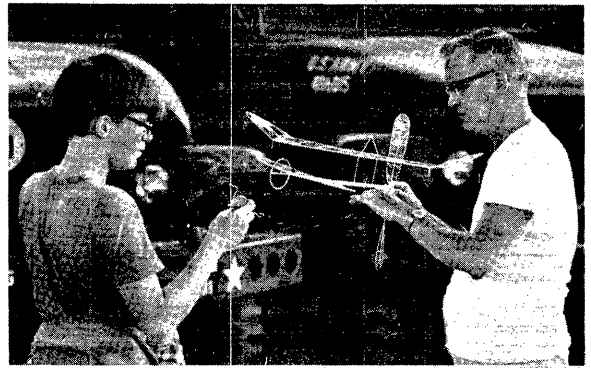
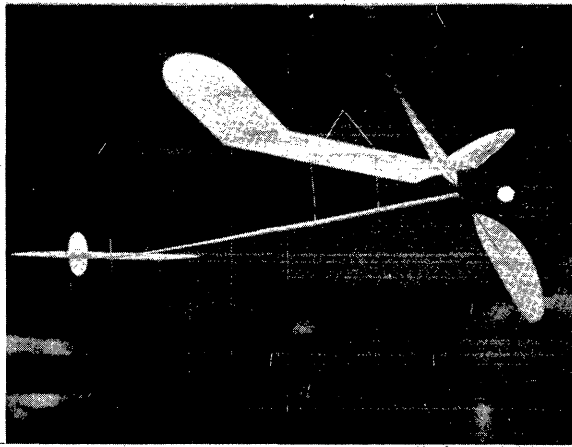
- URS SCHALLER, Glaserbergerstr. 74, 4056 Basel, Switzerland

Recent Publications

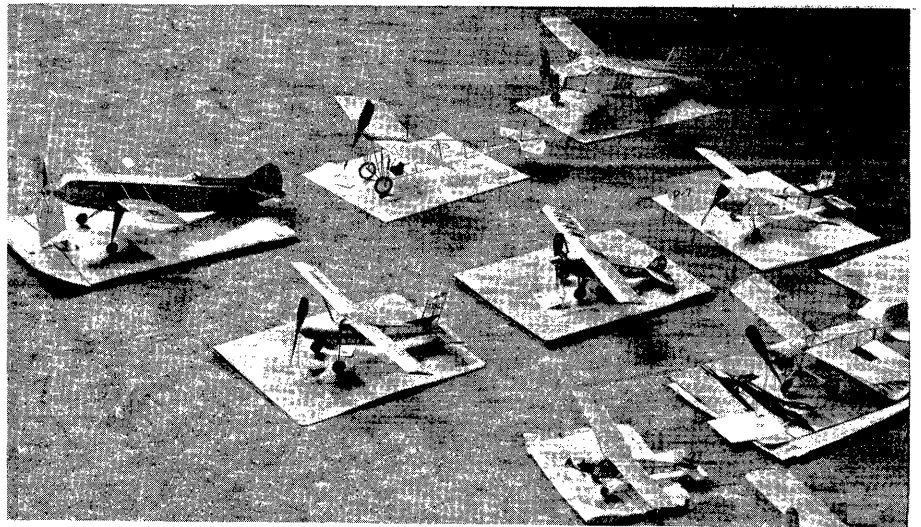
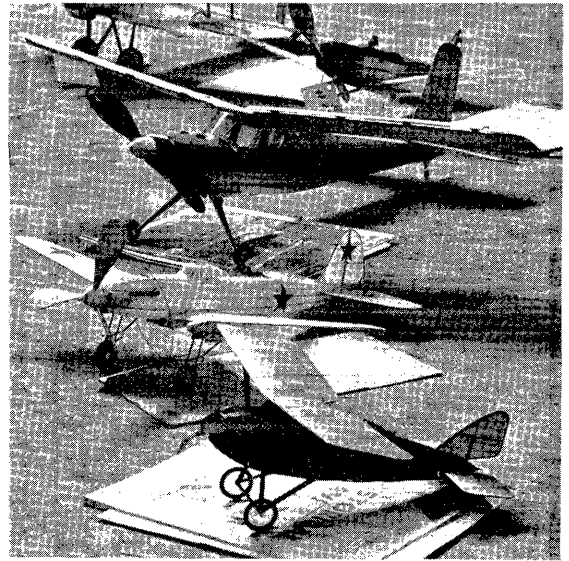
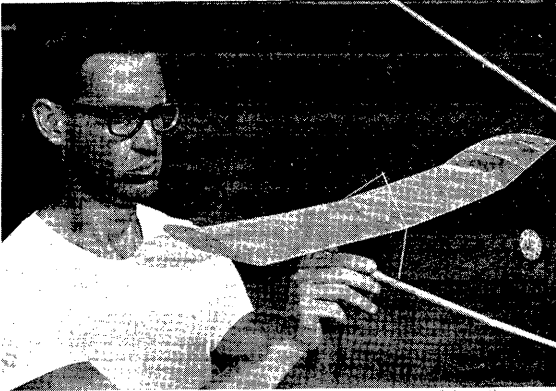
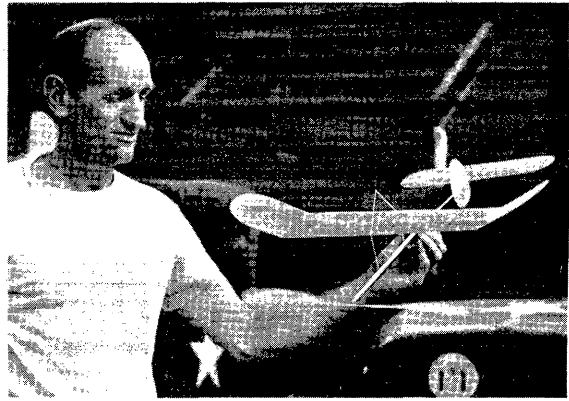
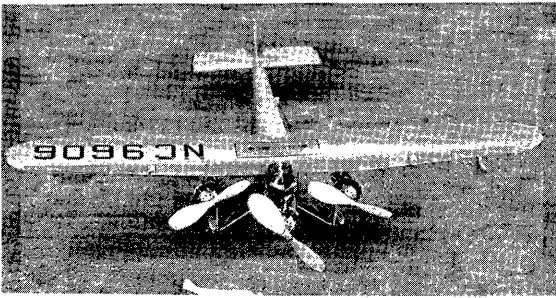
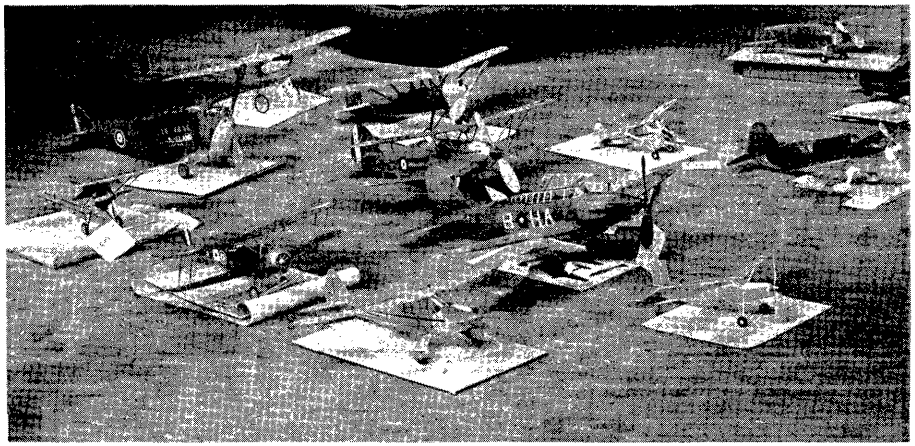
"Sympo 70", the third NFFS Symposium Report, contains three papers of direct interest to indoor fliers, besides several other papers of interest to most FF'ers. These three indoor papers are:

"Optimum Chord For FAI Indoor Models", by Bob Platt. This paper explains various aerodynamic factors involved in choice of wing chord for FAI indoor models, and concludes that a substantial increase in chord over preset values would be beneficial.

"A Simplified Method For Estimating The Neutral Point Of New Designs", by Hal Crane. This paper is Hal's second commentary on the importance of proper location of neutral point, and compares results obtained with the explained method, the method outlined in Sympo 2, and the Cole method (Jan. '69 INAV). The gain from a few minutes of computation is explained: The flight efficiency of an endurance model airplane can be made optimum by using an adequate but not excessive margin of stability. - A5









"Computer Evaluated Aerodynamic Design Criteria For Indoor Models", by Walter Erbach. This paper details how a computer was used to "fly" a typical indoor model at different trim settings and with different amounts of stabilizer area, while solving for lowest power required for level flight. One implication of the results is that smaller stabilizers than usual provide a more efficient airplane. The conclusions include an indication that variations in indoor airfoils have essentially no effect upon power required for level flight, and that the computer simulation is a valid approach.

Where can you get a copy of Sympo 70? Send \$3.50 to Annie Gieskieng, 1333 So. Franklin St., Denver, Colorado 80210. To get previous Symposium reports, send \$6 to get both '69 and '70 or \$8 for three - '68, '69 and '70.

#### Pen Pal Wanted

Rudolf Drnec, Krasneho 4, Brno, Czechoslovakia, is interested in free flight scale models and would like to exchange correspondence with U. S. fliers on the topic. A copy of Czech rules is available from INAV by sending a stamped, self-addressed envelope with the request.

#### CONTEST CALENDAR

MARYLAND - College Park. Second Annual Eastern Indoor Championships, Sunday, Aug. 30, 1970, 8:30 am to 4:40 pm. Site is Cole Field House at Univ. of Maryland; 98' ceiling and usually has good conditions. HLG, Scale, Paper Stick, Indoor Stick, Easy B, Unorthodox Aircraft, Peanut Scale. For other details, and special rules on Peanut, Easy B and Unorthodox Aircraft, contact Bill Bigge, 5131 Mass. Ave. NW Washington, D. C. 20016, ph. 202-OL 2-5606.

NEW YORK - Long Island. Cat. II indoor contest at Cant-lague Park, Hicksville, L. I., Sept. 27, 1970. Site is 190' dia. dome, 50' high. HLG, Easy B, Indoor Stick, Paper Stick, Scale. CD - Bill Dunwoody, 985 Ft. Salonga Rd., Northport, L. I., N. Y.

#### RECORDS? MAYBE!

1970 NATS, July 27, 1970, Cat. II (90' ceiling)  
Washington Park Armory, Chicago, Ill.  
Open Indoor Cabin - 20:25.2, Jim Richmond

#### FAI INDOOR REPORT

##### One Gram Model?

Anyone wishing to express an opinion pro or con about a proposal before the CIAM should send these comments to Dave Linstrum, 12 Holcomb St., Simsbury, Conn. 07060. The proposal would require the FAI model to weigh a minimum of one gram and permit the motor to weigh no more than one gram. Numerous comments pro and con have been aired here in the June and July issues of INAV, and copies of these will be furnished on request.

Meanwhile, a couple of new viewpoints have been expressed. Hewitt Phillips suggested that the basic model not be changed, but that it be required to carry a stipulated weight. This would tend to minimize the difference in model weight due to inconsistent wood supply, and would greatly simplify processing difficulties.

Paul and Nan Tryon brought up the valid point that a change in model specs late this year (the pertinent CIAM meeting is in December) would greatly handicap all who would try out for the team, in that there would be very little time to develop models before competition begins.

Because of the very late CIAM meeting, AMA HQ will help disseminate news about the results. All interested fliers should send a stamped, self-addressed envelope to AMA HQ in the middle of November. As soon as the meeting is over, the pertinent information will be sent out to all who request it in this fashion.

#### THE PICTURE STORY

Columns are numbered from top to bottom. Pictures by Bob Clemens unless otherwise noted.

##### Page 3 - Left Column

1. Jim Richmond's Paper Stick, touching down after winning flight.
2. Susan Weisenbach launches her Cabin job.
3. Very neat torque meter, designed by Paul Crowley and Bob Bienenstein.
4. Clarence and Kim Mather wind Kim's Paper Stick.

##### Right Column

1. Jim and Bill Haught prepare to fly a mike ship.
2. An unidentified mike ship climbs out.
3. Some of the AMA Scale entries.
4. Kim Mather's Nesmith Cougar (l.) and Clarence Mather's Buster. First in Peanut and high Junior in Peanut.

##### Page 4 - Left Column

1. Bill Bigge and his dirigible, after it lost some helium. It flew around with motor stick and prop suspended below the gas bag.
2. Ford Trimotor model. Outboard props driven by angle drive from motors in wings. (Chris Clemens photo)
3. Charlie Sotich checks his Paper Stick.
4. Ron Plotzke repairs his mike ship.

##### Right Column

1. More AMA Scale entries. Richmond's Pilatus Porter in lower right hand corner.
2. Clarence Mather and his Paper Stick.
3. AMA Scale entries; PT-19 at top, Helio Courier next, Stormovik by Mather, Waterman Racer by Bob Clemens.
4. Peanut Scale entries. Demoiselle in top center by Bob Clemens; winner of Best Craftsmanship trophy.

# INDOOR

## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

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

### New Members!

EDWARD CATTEY, 39 Pequot Rd., Wallingford, Ct. 06492  
MELBURNE C. OICKLE, 119 Martha Rd., Glen Burnie, Md.  
21061

LARRY REIMER, 1321 Ruger Ave., Janesville, Wis. 53545  
EDMUND A. WINTER, 1401 Longmeadow St., Longmeadow, Mass.  
01106

### Honorary Members

JOHN BLOUNT, 3 Cromwell Hill, Luton, Beds, England  
GORDON BURFORD, 51 Jetty St., Grange, S. Australia,  
Australia 5022

JULIO H. FERREYRA, Ateneo Popular de Versailles,  
Aeromodelismo, Roma 950, Buenos Aires, Argentina

### Snowed Under!!

Although several things appear to have been forgotten, we prefer to believe certain matters have merely been a bit delayed! That is, if you have NIMAS Award certificates coming, or if you won a place in the NIMAS postal - any of several things which must be "spare time" projects here - be assured that they will be completed reasonably soon. However, due to an acute lack of time - membership and subscription renewals are not being acknowledged unless they contain some message which requires an answer.

### Site Survey Continues

Homer Adams, Box 491, Rome Ga. 30161, is still sending out site survey forms. If you received one and haven't returned it, or if you get one soon, please return it so he can complete the initial survey. For those who haven't heard of this effort, the end result will be a pamphlet or book which lists all the sites in use around the country, site characteristics, and a contact man. If you're moving or traveling, you can visit these sites and maybe join a flying session.

### A Survey

Beginning in March, those who received renewal notices also received a questionnaire which outlined a new event concept. This questionnaire was worded thus:

What would be your reaction to the following concept:

1. Novice event- 3 or 4 gram minimum weight.
2. Intermediate or regular competition event- 1 gram minimum weight.
3. Expert or Records class- no minimum weight.

All models to be 65 cm span and flown in accord with standard AMA rules except that fliers would be permitted to enter only one of the three events, thus declaring himself to be novice, intermediate or expert and taking his lumps as they come. Also, what would be your reaction to disqualifying flights which rafter-bang or ceiling scrub? The intent of this concept is to relieve the pressure to have super-good wood, and to increase the useful life of the models and to make competition more fun and less pressure.

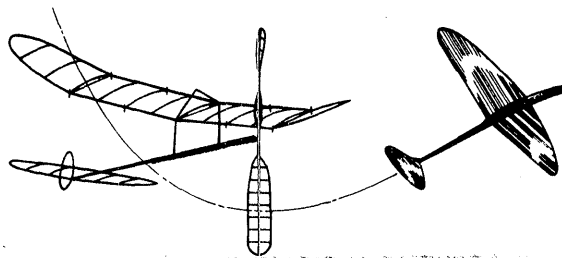
In stark contrast to the questionnaire circulated by Clarence Mather (see FAI Indoor Report), this sampling of the NIMAS membership yielded the following results from a total of 54 responses:

Against the concept - 14 votes (26%).

For some part or all - 40 votes (74%).

For (with reservations) - 15 out of the 40 above, or 38% of total For vote.

13 of those with reservations would permit ceiling scrubbing, especially for Novice and Intermediate classes. Other suggestions were to have only one extra class, and it was suggested that either 1 gram or 2 grams be the top weight. 75 cm max span was also suggested. Finally, one



suggestion was to require contestants to advance after winning a certain event. However, this would place us in a position of creating a new indoor event to attract new fliers, then making the successful ones junk their models and build new ones just as soon as they get the old models to fly decently!

Since so many people favor the concept of a weight limit AMA event, the next logical step would be to set up trial events at local contests and see what the participation would be. Perhaps PennyPlane will fill this need, or perhaps PennyPlane would fill the novice event slot. Perhaps another name would be more appropriate for that event - such as "introductory" event. After all, the purpose of the event is to provide a competitive event which emphasizes design and flying skill in place of choice wood and handling skill required for "full house" indoor. Any advancement to lightweight classes should be made by the fliers themselves, and true novices would have to be separated from more experienced fliers to give them a chance. Much has been said about how wonderful the AMA Cub/Delta Dart program is for beginners; can you imagine how much like Easy B the event would become with experts flying it?

### FAI Benefit Meet

The concept "FAI Benefit Meet" was developed by Clarence Mather, and is this: a model contest is held which offers low cost prizes. Excess entry fees are donated to the FAI Inboard Travel Fund (fund maintained largely by FAI program fees and donations). The meet can be for any type of model, and a couple of outdoor FF meets held in 1969 donated their "take" to the Indoor Fund! The point is this: the Program can use the help, and these small meets can be fun.

### Recent Publications

"Salt Mine Saga", by Clarence Mather, is his story of the 1970 Indoor World Championship. It is well written and interesting, and covers points not told in other articles on the subject. It appears in the Oct. '70 Model Airplane News.

### NIMAS Awards

The NIMAS Awards program was proposed in its final form in Dec. '64 INAV. The concept is that NIMAS Awards would be "an incentive award for performance which did not exceed the existing record but was better than average flying." Since then, 128 fliers have received Awards, and 17 of these have received all three awards in a given category to become NIMAS Aces. The program offers an award for three levels of performance (Silver, Gold and Diamond) in both HLG and rubber flying, for each AMA ceiling category for a total of 18 Awards. The Awards are certificates suitable for framing or for keeping in a scrapbook. A parallel system with lower qualifying times is set up for Juniors. For more details, send to Box 545, Richardson, Texas 75080 for application blanks. The latest flier to gain awards is Dan Domina; Crane is a Cat. I Ace.

SILVER CAT. III GLIDER AWARD - 0:58.0, Dan Domina

GOLD CAT. II GLIDER AWARD - 0:57.0, Dan Domina

GOLD CAT. II RUBBER AWARD - 26:56, Hal Crane

### FAI INDOOR REPORT

#### Advance Information

There has been considerable concern over possible changes in the specifications for FAI Indoor models. If any changes are made, this will be accomplished at the CIAM meeting in December. Since this is a very late start toward building models for the Team Selection Program next year, special arrangements are being made by AMA HQ to get the word out. If you want information of rules changes by the CIAM, send a stamped, self-addressed envelope to AMA HQ with your request.

#### FAI Questionnaire

Last spring AMA HQ distributed a questionnaire from Clarence Mather; the questionnaire covered both the specs

for the model and the Team Selection Program. Below are listed the results of this questionnaire, in abbreviated form.

- 46 fliers approved the 1969 Team Selection Program, and 11 suggested changes.
- Weight rules for FAI Indoor models were voted down, by the margin of 40-14.
- Given the assumption that some form of weight rules must be adopted, the vote was:
  - one g min. model/one g max. rubber - 8.
  - one g min. model weight only restriction - 36.
- Choice of model size if min. weight rule not adopted:
  - 50 cm - 4.
  - 65 cm - 35. (present size)
  - 75 cm - 17.

**CD's Needed!**

It is quite likely that the next Team Selection Program will closely parallel the 1969 program managed by Clarence Mather, in view of the good acceptance of the 1969 program as outlined above. It will be necessary to have many CD's to help run the program, and all who are interested in helping are requested to drop a line to Box 545, Richardson, Texas 75080.

**CONTEST CALENDAR**

Only one listing has come in to firm out the schedule for this season, so let's get them in! Flying sessions, contests, club meetings and special programs are all good things to list here. Please be sure to send information to Box 545, Richardson, Tex. 75080, by the 5th of any particular month to assure listing in that month.

VIRGINIA - Hampton. Record trials at Willis School, Oct. 17-18, 1970. Hal Crane, 4002 Buchanan Dr., Hampton 23369.

**STATE OF THE ART**

The model of the month is Jim Richmond's Cabin model, which currently holds the Open Cat. II Cabin mark at 20:25 and won both the 1969 and 1970 Nats. Jim describes the model in this way:

The plane is a conglomeration of parts from other designs and therefore qualifies for the kind of name\* that Manfred Koller hangs on his ships except that it has proven itself to be deserving of something better. Maybe I should call it "Lo FAI" or something since it uses a heavy old Bienenstein "Lo Down" fuselage with modified gear and tail assembly, and an FAI wing and prop. It is a good thing that the fuselage is so strong, because I blew a motor in it prior to my Nats flight and was able to repair it (after a few hours of desperate work and a few yards of patching film). Lesson: "don't ever try to attach a motor to a rusty hook." I sanded it smooth and coated it with cement before the next try. The plane went off with about 1620 turns on the record flight and climbed to about 67 feet.

\*Koller claims to copy other models, and names the result "Bastard"!

**RECORDS? MAYBE!**

CAT. III RECORD TRIALS, Aug. 2, 1970, 180' ceiling  
Santa Ana Hangar, Santa Ana MCAS, Calif.  
Senior AMA Cat. III FAI - 23:58.6, Bill Gibbs

2nd ANNUAL EASTERN INDOOR CHAMPS, Aug. 30, 1970 Cat. II  
Cole Field House, Univ. of Maryland, 98' ceiling  
Open Cat. II Helicopter - 7:01, Tom Vallee

**THE "TOP TEN" LISTINGS**

The Top Ten Easy B listings began in September '69 and are based on the winning flights from the Annual NIMAS Postal Meet, which is held during March and April each year. After the Postal, fliers can submit new times to "bump" their way higher in the listings. Fliers who did not enter the Postal can submit times to make it into the listing.

The Top Ten Ceiling Dodgers came into being in Jan. '70, and is set up to encourage experimentation on model design and trim. The idea is to get the highest time possible in a given site, without letting the model touch the ceiling.

Any model which will meet AMA rules for any indoor event will qualify for the Ceiling Dodgers. The basic Easy B rules in the AMA Rule Book define the size of the Easy B, and the models must have solid motor stick and tail boom, have unbraced surfaces and be covered with paper. Ground rules for both listings are that flights are to be made according to AMA rules. Submit the times and measure the ceiling height of your site according to FAI measure (see Rule Book). Also submit your estimate of how high the model went (for Ceiling Dodgers only). The

times will be corrected to 35' ceiling height and listed in order as below.

**Top Ten Easy B**

OPEN	Time/ceiling	Fudge	Adj. Time
1. Bob Platt	558.8/20'	1.32	739.2
2. Clarence Mather	556/22.3'	1.26	696.6
3. Joe Portecorvo	485/17.75'	1.404	681
4. Hal Crane	511/20'	1.32	675.9
5. Harry Cook	538/26'	1.16	624.2
6. Jim Walters	382/17.75'	1.404	536.4
7. Fudo Takagi	365/21'	1.29	459.6
8. Howard Haupt	312/21'	1.29	402.8

**TOP JUNIORS**

1. Dave Sandelius	449/17.75'	1.404	630.5
2. Rick Sironen	331/17.75'	1.404	464.8

**Top Ten Ceiling Dodgers**

	Time/ceiling	Fudge	Est. Altitude (to 35')	Score
1. Stan Chilton	1115/35'	1.0	33'	1115
2. Tom Vallee	810/20'	1.32	19'	1068.2
3. Hal Crane	682/20'	1.32	19'	850.2
4. Dick Hardcastle	602/23'	1.23	22.5'	743
5. Hewitt Phillips	528.2/20'	1.32	15'	698.7
6. Howard Haupt	456/22'	1.26	15'	575
7. Harry Cook	471/26'	1.16	24'	546.5
8. Jim Davidson	280/13'	1.64	9'	459
9. Richard Sironen	308/37'	.972	33'	396.6
10. Roger Schroeder	239.5/15'	1.53	13.5'	365.9

To submit times for listing in either Top Ten, send the time, ceiling height and estimated altitude to Bob Putman, 507 Darlene, Arlington, Tex. 76012 by the first of the month that the listing is intended for.

**INDOOR ELSEWHERE**

Indoor activity is growing in South America, and is centered primarily in Argentina and Uruguay. The Argentine Indoor Nationals took place on March 27, 1970 in a 15 m site.

1. Hector A. Beggiatto	778	851	1629
2. Eduardo A. Grippio	880*	742	1622
3. Alberto A. Barilari	732	867	1529
4. Nereo Beggiatto	772	719	1491
5. Domingo A. Sassone	703	773	1476
6. Alberto C. Collazzo	517	552	1069
7. Luis M. Coronel	372	372	744
8. Hector M. Ferreyra	210	245	455

\*New Argentina national record.

**CONTEST RESULTS**

Two fliers, Bob Clemens and Hal Crane, made partial reports of the activity at the Maxcutors' 2nd Annual Eastern Indoor Championships. The attendance was somewhat low, but the competition was tough in the good conditions which prevailed in an excellent site.

**Open HLG**

1. Stitts	92
2. Thornhill	89

**Jr. Easy B**

1. Fisher	5:51
2. Chris Clemens	4:29.5
3. Ronnie Ganser	4:25

**Open Easy B**

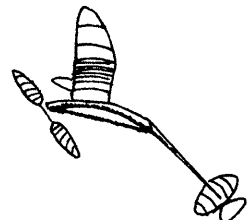
1. Bob Clemens	11:01.1
2. Bob Platt	10:58.8
3. Tom Vallee	10:49

**Paper Stick**

1. Bob Clemens	16:11
2. Tom Vallee	15:54
3. Bob Platt	15:43

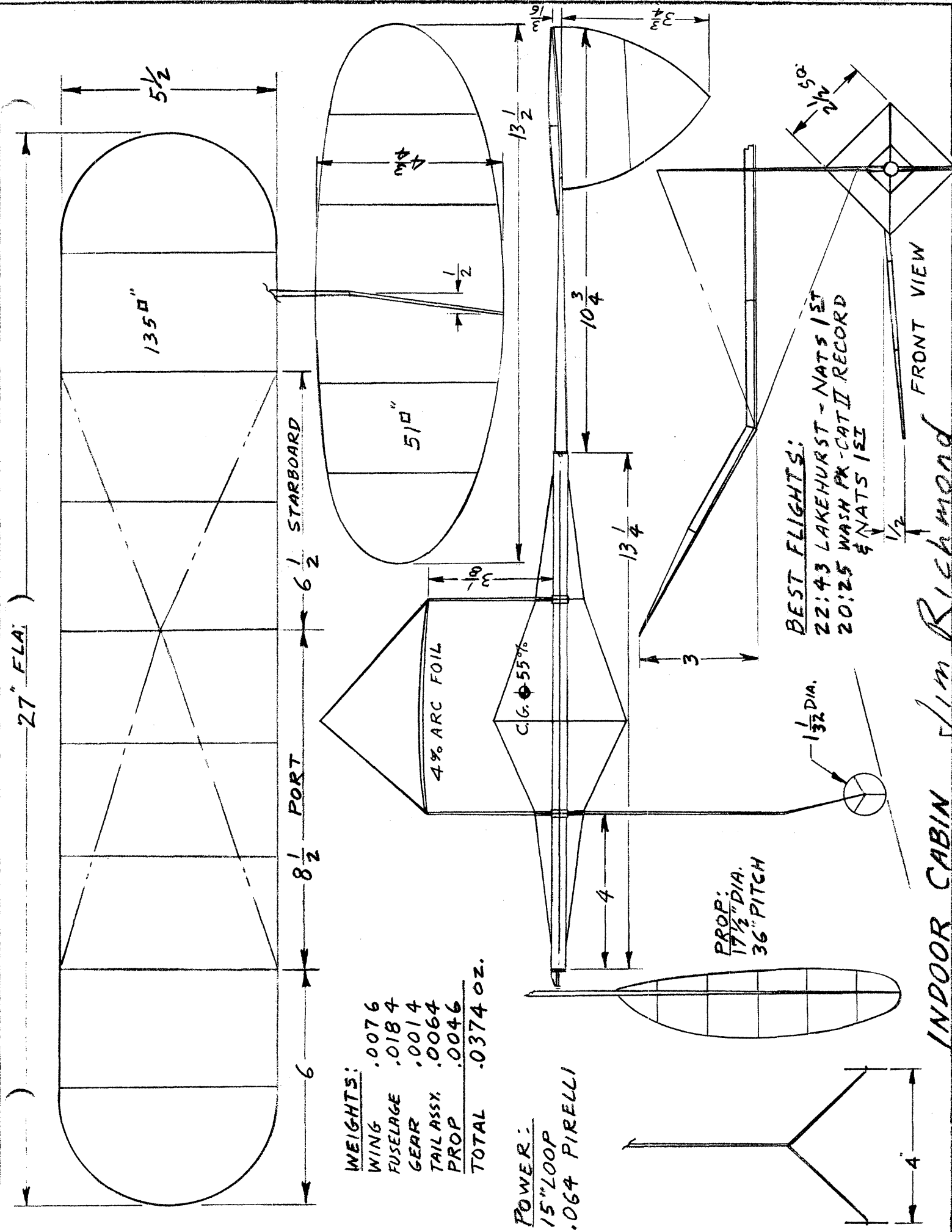
**Indoor Stick**

1. Bill Hulbert	27:06.2
2. Hal Crane	26:56.4
3. Bob Platt	25:38



TRY IT WITH LESS WINDS, SAM





WEIGHTS:

WING	.0076
FUSELAGE	.0184
GEAR	.0014
TAIL ASSY.	.0064
PROP	.0046
TOTAL	.0374 oz.

POWER:  
15" LOOP  
.064 PIRELLI

BEST FLIGHTS:  
22:43 LAKEHURST - NATS I ET  
20:25 WASH PK - CAT II RECORD  
NATS I ET

INDOOR CABIN Jim Richmond

## CHANGE OF PACE

Last month we had a photo of Bill Bigge's model dirigible which actually flew. In response to my query for details of this model, Bill sent the following:

The airship weighs .175 oz. covered, .097 bare without fins or accessories. The frame is all .040" sq. medium soft balsa with dacron bracing. The center of gravity of the aerostat is well behind the CG of the displaced air. Consequently no attempt was made to save weight in the power unit slung under the nose.

Speed is about 2 feet per second on just over one row of knots in a loop of .041 pirelli. The prop is an old 15" x 37"!

Gross lift is about .5 oz. on methane, and roughly 1.0 oz. on helium. The Microlite weighs about .00006 oz./sq. in., so the surface is about 1300 sq. in. Polyethylene dropcloths are available as light as .00013 oz./sq. in. - that's getting pretty close to condenser paper. The stuff has pretty good immediate or slightly delayed (seconds) elastic recovery of stretch. It can be shrunk with heat and patched like microfilm. I have been using it for small airplane-like kites and it looks promising for indoor/outdoor models similar to PennyPlanes. It gives less strain on framework than mylar and has no moisture absorption. Also it holds gas pretty well.

It should be quite feasible to make a sturdier airship covered with polyethylene for about 0.4 oz. It would probably be worthwhile to taper the stringers and use smaller cross-section members for the rear rings.

## A LOOK AT YESTERYEAR

### Microfilm - 1941 Style

The commentary below is a translation by Manfred Koller, from a 1941 German model supplies catalog.

#### General items on indoor models:

Building and flying indoor models has been done as a sport since 1937. Since it is a principle not to use foreign materials (at that time WWII forced the Germans to limit expenditures of pounds and dollars for war imports), we have not reached the standard of the other countries which also fly indoor models.

Nevertheless, the performance of German models, still using some foreign materials (they mean balsa), is so high that every modeler who tries this kind of modeling gets most enthusiastic about it.

The development of these models depends upon keeping the whole model light. Even the covering material plays an important role. Thus high performance indoor models are covered with microfilm, which has been available in Germany since 1937.

#### The technique of covering indoor models with microfilm.

Before starting you must have the following:

1. A large basin of lukewarm water; the basin must be thoroughly cleaned before filling.
2. A hoop consisting of a frame of wires with two bows.
3. A small bottle of UHU-microfilm. (comment by Manfred: This solution was sold by a big firm which produced a glue called UHU-hard. The solution was still available in the late 1950's. I tried one bottle, getting film with red, green, blue and silver, but it was a thick film which seemed heavier than condenser paper.)
4. A small brush, and the wings and stabilizers of the model.

First, place the wire frame of the hoop on the bottom of the water basin and pour (they say drip or trickle) four or five drops on the surface of the water. See that the drops are placed in a line, so the film is gets large enough to cover the hoop. Do not drip all drops at the same place on the water! If you do not use colored microfilm (red, green, yellow or blue), you can see the film only by looking on the water from the side, thus seeing the film in all colors of the rainbow. Two minutes later you lift the hoop to the surface of the water. When you are sure the hoop is covered on all parts with film and it is overlapping the hoop all around, pull the frame up very carefully since by moving fast there is danger of tearing the film. Hold the hoop vertically for a few seconds so the water can drip back into the basin.

Then the covering begins. (There were no remarks about drying or storing the film for days or even hours - Manfred) Wet the frame with saliva and place the part to

be covered on the film, where it sticks by adhesion. To remove the overlapping parts of the film, use the fine brush dipped in glue and guide the brush around the outline one or two cm away from the edge of the model. The film will melt immediately to the edge of the model and we can remove it from the hoop.

Though the technique sounds relatively simple, a certain amount of experience and practice is necessary. This is especially true when removing the film from the water; it tears very easily and the work should be done very carefully. If one has a few failures it is not too bad, because one bottle of UHU-microfilm lasts for 10 or 20 models.

## HINTS AND KINKS

This article by Richard Miller comes from an early INAV, but it is still a good idea today.

### An Indoor Light Box

I don't think I've built a single HLG wing or stab in the last few years but what I thought how nice it would be to work over a piece of glass which was illuminated from below and thus be able to watch the sanding as it progressed. The idea finally caught up with me and I went off to the neighborhood glass shop and got the fixin's, stopped at the local lingerie shop for some gift wrapping paper and picked up a GE bulb FG (for gliders?) #1048-AX which is a tubular frosted bulb about five inches long. An hour after getting home I had used this assortment of odds and ends to make a stabilizer and was very excited about the results.

The first place that the under-lighting came in handy was in placing the template on the sheet of balsa. Grain doesn't always run parallel to the edges - why should the surface cut from the plank? After some preparatory planning the stab-to-be was placed on the glass for the majority of the sanding. Not only was it possible to work much more quickly by this method but the fine graduations of light which showed through the wood permitted a degree of control in sanding the surface that I had never before experienced.

The technique need not be limited to the HLG however. It should prove just as handy on motor stick and tail boom blanks for mike and paper ships as well as on tapered sheets from which spars are cut. Of course, if anyone is still carving wooden props the application is obvious.

The pieces of glass I got from the glazier measured 6" x 24", one frosted and one clear, and were taped together. The use of frosted glass (like the back plate on a camera) was to diffuse the light. I got the gift wrapping paper in case the diffusion provided by the glass wasn't adequate - and it wasn't, so one layer of the paper was sandwiched between the two layers of glass. The bulb was frosted for the same reason and was laid end-wise under the glass-paper-glass sandwich which itself was supported on a couple of cans.

Although the glass didn't cost much - \$2.50 for the two pieces - I think you can do better. I looked for, but could not find, ordinary glass shelving. These standard glass shelves have several advantages, not the least being that they are manufactured in the long thin shapes we want. Secondly they usually have rounded edges which the glazier's glass doesn't - thus the tape. Finally they are designed to be supported at their ends with a load between. If charring were a problem you might try some of the asbestos or glass cloth used by photographers to diffuse spots or floodlights. Otherwise two such shelves, with opaque paper between them might be better. And the ideal solution to the light source might be fluorescent bulbs which give off a diffused light and come in a variety of lengths.

## QUESTIONS AND ANSWERS

42. If a paper stick and a microfilm model of the same design are balanced to the same margin of stability, will they fly alike?

Two models of the same design, balanced to the same margin of stability, and adjusted the same (including turn radius, wing warps and thrust line), should fly in similar fashion. That is, recovery from ceiling scrubbing and collisions, flight attitude and power handling capability should be the same. However, the paper ship will be about 70% heavier and thus will have significantly lower flight times in virtually all circumstances. In other words, if the models weighed the same they should fly the same.

# INDOOR

## NEWS and VIEWS Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

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

### Honorary Members

FRIOLI ADALBERTO, Via Gambalunga 10, 47037 Rimini (Forli)  
Italy

### Family Memberships

BRENDA McDOWELL, 205 N. 4th St., Champaign, Ill. 61820

### Change of Address

DAVE LINDSTRUM, 972 Plum Grove Circle, Buffalo Grove, Ill.  
60090

### AMA Election

By the time you read this, you doubtless will have an AMA ballot to participate in the election of an AMA president to replace John Patton who declined a nomination for another term. Also at stake this year are District elective offices for even-numbered AMA Districts. Of course, the other District offices (Contest Board members, Contest Coordinators and Associate VP's) are indirectly involved since each VP candidate submits a slate of his appointive officers at the time he accepts the nomination.

Thus, you can help assure proper functioning of your District by informing yourself of the capabilities of the candidates and his appointees, supporting the best slate of officers and encouraging fellow AMA members to vote for them also.

Two regular nominees are on the ballot for President, and Cliff Piper (Dist. I VP) is running on a write-in campaign. The other two candidates are John Clemens, known far and wide for his Nats publicity work, and John Pond, an old-time FF flier and most recently known for his work in establishing the Old Timer FF activity at its present popularity. It has been shamefully traditional for less than 20% of the AMA membership to participate in these elections. Is it possible that we might muster a few more voters this year?

### First Come, First Served

Joe B. Barkley, 1308 Koblan Dr., Hixson, Tenn. 37343, has a copy of Ron Warring's "Indoor Flying Models" in fair condition with all pages intact. He will sell it for \$1 postpaid to the first applicant. The book was published in 1946, and is quite interesting as a source of historical information.

### FAI INDOOR REPORT

#### Team Selection Chairman And Committee Chosen

Bud Tenny has been chosen as Chairman of the 1971 Indoor Team Selection Program. The following fliers have agreed to act as members of the Indoor Committee. They will assist with final decisions about the program and help coordinate the program in their area. All fliers who are interested in the program are urged assist their nearest coordinator in lining up CD's and sites for the qualification trials.

Bob Gibbs  
5005 Halifax Circle  
Cypress, Cal. 90630

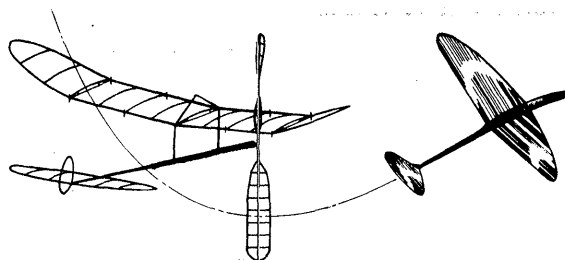
Paul Crowley  
32604 Tecla  
Warren, Mich. 48093

Bob Dunham  
P. O. Box 7151  
Tulsa, Okla. 74105

Hal Crane  
4002 Buchanan Dr.  
Hampton, Va. 23369

### CIAM Agenda Settled

The text below came from a report to Dave Lindstrum from Luigi Bovo, Chairman of FF Subcommittee. It was abstracted from the complete report by Mr. Bovo to the Subcommittee; presumably this is the only proposal on the agenda affecting Indoor, since this is the only one mentioned in the report.



B. Proposal from the S/C, after the Indoor World Championship in Romania. The proposal is:

Add to par. 3.4.2 - The weight of the model without rubber shall not be less than 1 gram.

### Reasons:

Models are easier to build and this should attract more people in agreement with the CIAM policy as discussed during the 1970 Bureau Meeting.

Models are stronger (the percentage of crashed models in Slanic Franova was over 50%).

Performance is reduced, making it easier to organize a World Championship should the number of entrants further increase, as hoped.

### Indoor World Records

The record listing below was furnished by AMA HQ, and was current to approximately Oct. 1, 1970.

Cat. I	21:06	9/13/69	Jiri Kalina	Czech.
Cat. II	27:28	6/7/70	Andras Ree	Hungary
	*30:07	8/26/70	Jiri Kalina	Czech.
Cat. III	33:07	8/3/70	Jim Richmond	U. S. A.
Cat. IV	45:40	9/22/62	K. H. Riecke	W. Germ.

\*Tentative record; will supercede 27:28 mark if it is homologated.

### INDOOR ELSEWHERE

#### Last 1970 Cardington Session

While reporting these results, Bruce Edwards said, "On Sept. 27 we had our last meeting for the year at Cardington and our first competition, so this really could be labelled our 1970 Nats. Conditions were perfect, and I do mean perfect. Once into pattern the models stayed centered. To all us newcomers we suddenly found out what indoor is all about."

1. Reg Parham	29:55	*33:13	63:08
2. Stan Wade	26:17	27:48	64:05
3. Laurie Barr	26:16	25:48	52:05
4. John Blount	25:21	23:48	48:41
5. Mike Fantham	17:24	18:02	35:26
6. Martin Shepherd	17:40	16:58	34:38
7. Bruce Edwards	13:40	16:38	30:18

\*New British record and first 30+ 65 cm flight in England.

### CONTEST RESULTS

LIAMAC Indoor Meet, Sept. 27, 1970, Cantiague Park, Hicksville, New York. 50' ceiling.

<u>Jr. HLG</u>		<u>Sr./Op. HLG</u>	
Bob Dujat	62.8	Don Edson	75.2
Ron Stransky		Ed Franklin	
Barry Pallet		Art Slater	
<u>Easy B Jr.</u>		<u>Easy B Sr./Op.</u>	
Chris Clemens	5:45	Bob Clemens	9:04.8
Barry Pallet		Frank Haynes	
Bob Dujat		Bob Nelson	
<u>Scale Jr.</u>		<u>Scale Sr./Op.</u>	
Barry Pallet	106	Don Edson	155
Bruce Pallet		Don Garofalow	
Gerald Jones		T. Quermann	
<u>Indoor Stick</u>		<u>Paper Stick</u>	
Don Garofalow	9:58	Bob Clemens	9:32.4
Joe Nuszer		Frank Haynes	
Jean Pallet		Ed Franklin	

Jr. Hi Point - Barry Paillet  
 Sr./Op. Hi Point - Jean Paillet  
 Meet Hi Point - tie between Barry & Jean Paillet

Special Thanks to Pan Am Athletic and Social club for continued sponsorship of this meet!

PAPER STICK PERFORMANCE SURVEY

Recently a question came up about who might be rated as "top paper stick flier". This is a difficult question to answer, since such a rating might be established by any of several methods of evaluation. However, information necessary to make such a choice is presented in the chart below. Names were presented essentially in the order they were taken from back issues of INAV; all flight times were converted to Nats Championship points, since these points express performance based on top time. For example, for a top time of 20 minutes, winner gets 100 points and a time of 15 minutes would get 75 points, regardless of numerical contest placing. All the scores below are from Nats Paper Stick results for the year heading the column.

	'62	'63	'64	'65	'66	'67	'68	'69	'70
Klintworth	100		100	86	88		94	62	
Bigge	94	62							
Gough	89								
Stoll	86	99		78	100			79	85
Atwood		100	89	87					
Sotich		82	96	81	70	80	90	68	78
Mumper			99	89	77		99		
Kopeccky				100					
Cummings				95					
Hindes				90					
Richmond				87	76	75		100	100
Randolph					94	100	100	62	
Powell						95			
Gitlow						91			
Belieff							99	67	75
Rohrbaugh					75		75	75	95

QUESTIONS AND ANSWERS

43. On a C.M.O.S. chart, what is the meaning of the 0% notation?

Simply put, 0% margin means that the model would have neutral stability; that is, there would be zero restoring force to right the model after an upset. "Would have" is the correct statement, since we are using a stability chart designed for A-2 gliders. Indoor models have different constants, but the method and chart remains valid for comparison if not for absolute measurements. If the proper chart yielded a negative value of stability margin, the model would tend to diverge farther after an upset. A positive margin would indicate that the model will tend to right itself.

The exact amount of error in the NIMAS C.M.O.S. chart has been estimated to be between 15% and 40%. For our purposes we simply say that 0% to perhaps -8% margin (as computed on the NIMAS chart which appears in Jan. '69 INAV) is about ideal for most indoor models in average to poor conditions. We may be able to use -15% for ideal conditions for record attempts, but the charts in INAV will continue to be computed for 0% for simplicity.

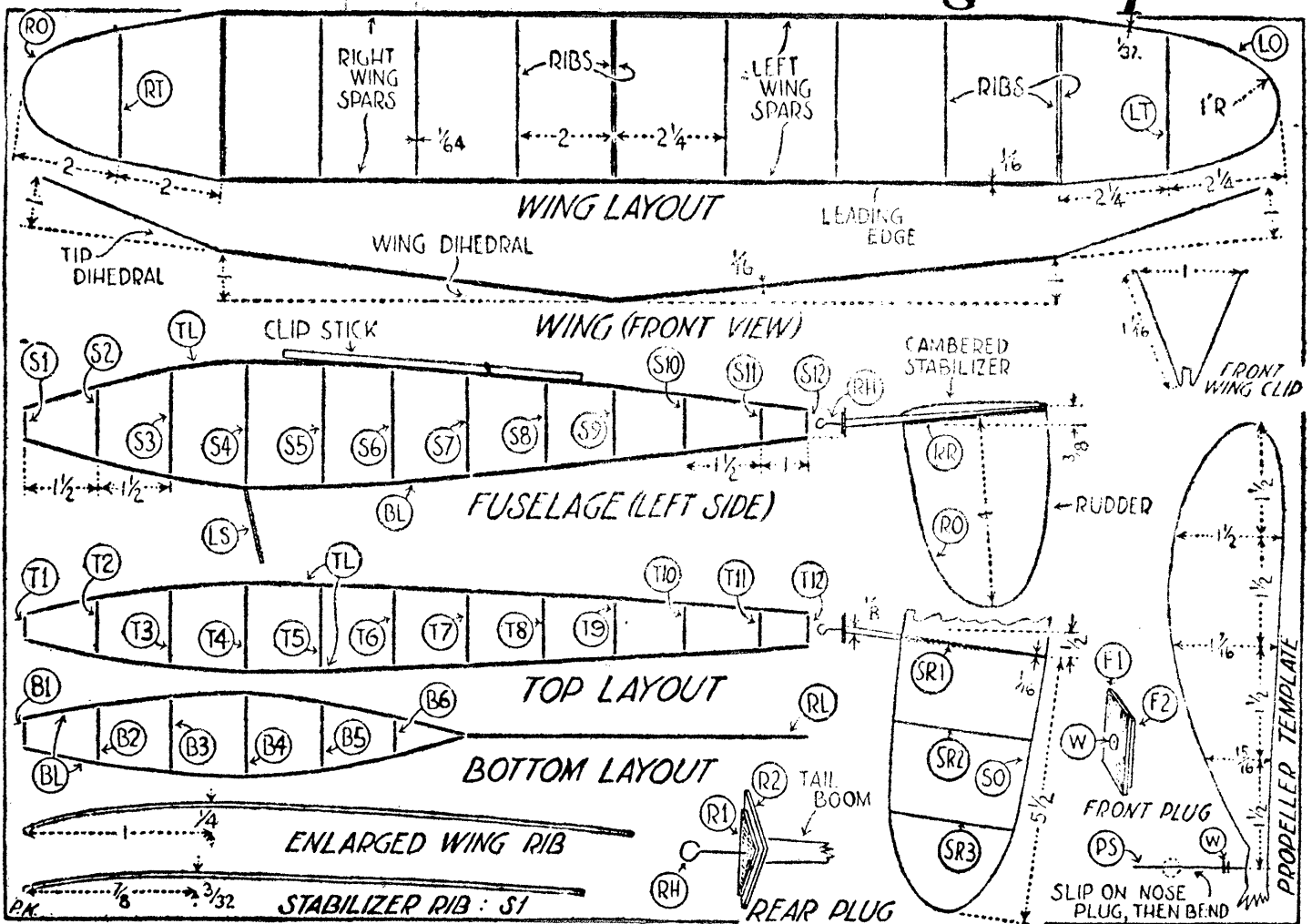
STATE OF THE ART

The model of the month is Tom Vallee's late Cat. I cabin model "Snarf". It twice broke the record, and was an excellent approach to "tailoring" a model to a specific site (JFK Jr. High, 20' ceiling). Part of the design concept was short-coupled fuselage and low pitch prop to insure reliable flights in small low ceiling sites.

A LOOK AT YESTERYEAR

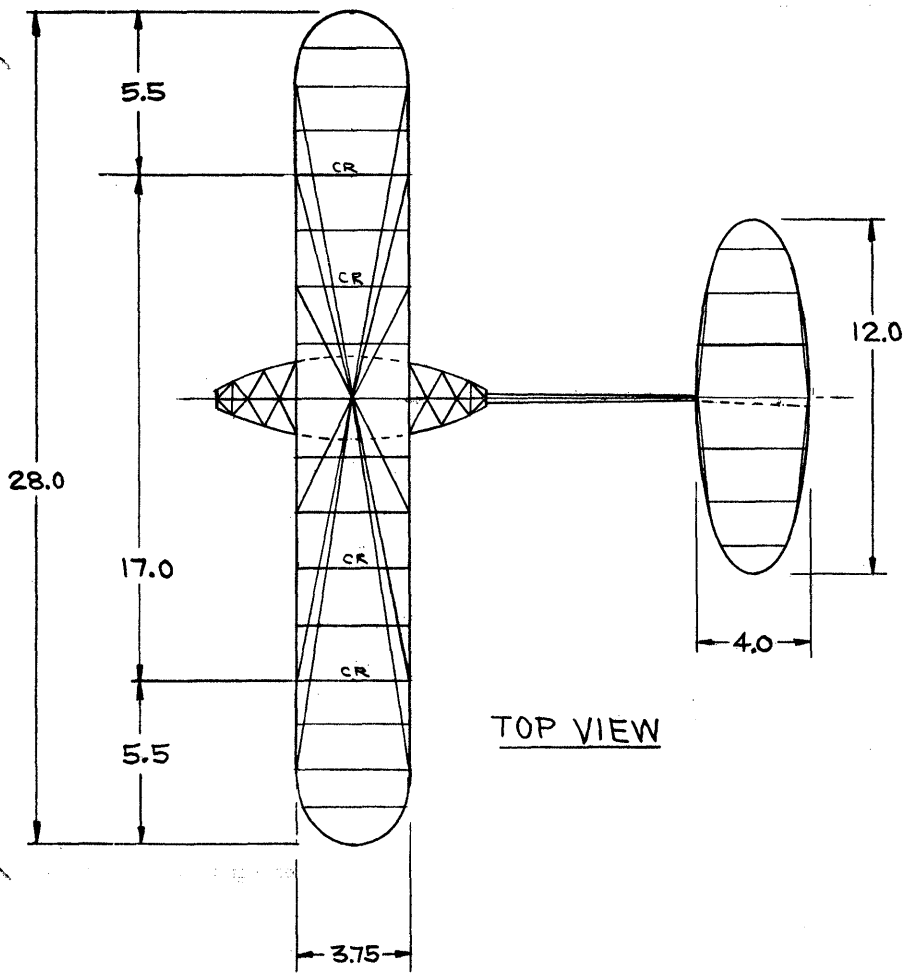
One of the problems which has always been with indoor modelers has been where to get information on models and flying. In the early 1930's, Philadelphia was a major center of indoor activity, largely due to the assistance of the "Philadelphia Evening Bulletin" newspaper. This paper published a model plan and building instructions every Saturday, thereby helping the activity. One such plan, furnished by Bill Lindsay and enlarged by Harry Keshishian, is shown here. A question: Who was the first designer to use the present-day cabin model layout, with a separate motor pod and fixed wing location? (Stokes used fixed wing incidence and moved the wing fore and aft to change trim, as was done on stick models of the same era.)

# How to Build Stokes' Fuselage 'Ship'

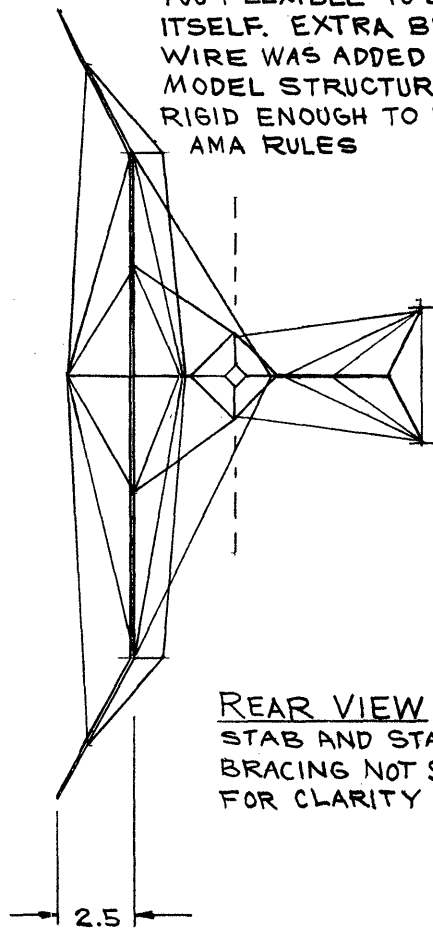




COMPLEX WING AND  
LANDING GEAR BRACING  
NECESSARY AS MODEL WAS  
TOO FLEXIBLE TO SUPPORT  
ITSELF. EXTRA BRACE  
WIRE WAS ADDED TILL  
MODEL STRUCTURE WAS  
RIGID ENOUGH TO MEET  
AMA RULES



TOP VIEW

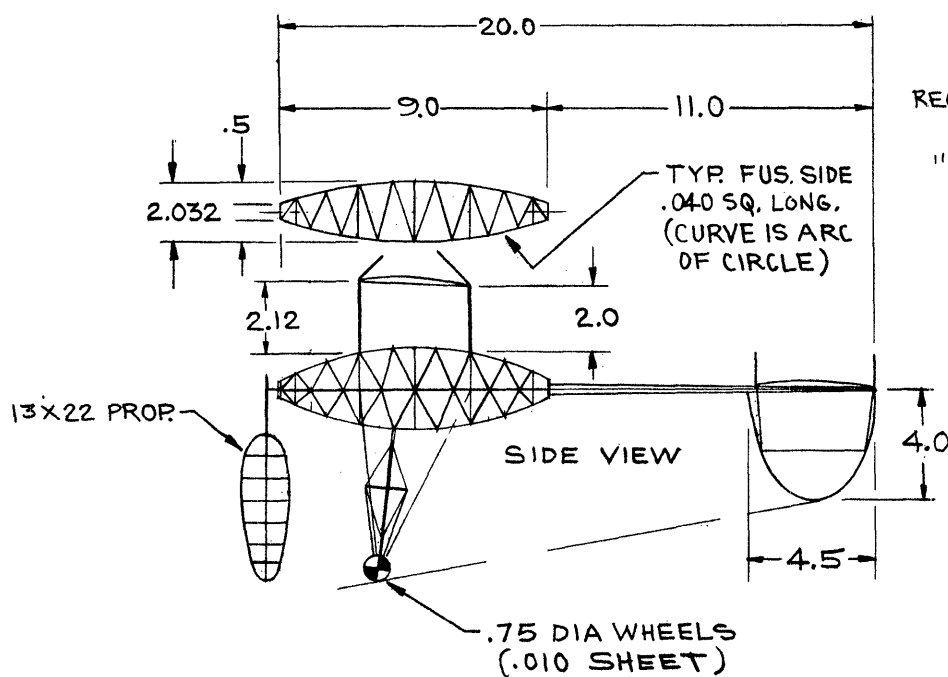


REAR VIEW  
STAB AND STAB  
BRACING NOT SHOWN  
FOR CLARITY

SNARF  
B CABIN MODEL

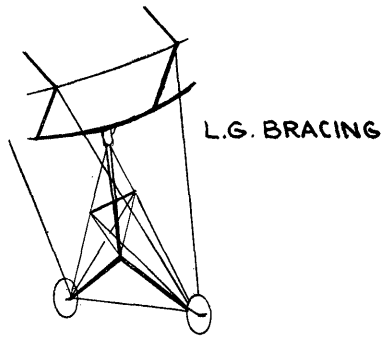
BROKE B CABIN  
FOR CAT I - TWICE

SHT. #1 TFV 8/22/68



SIDE VIEW

REQ'D CROSS SECT. AREA =  $\frac{L^2}{100}$   
" " " " =  $\frac{400}{100} = 4 \text{ in.}^2$



L.G. BRACING

SNARF  
B CABIN MODEL

SHT. #2 TFV 8/22/68

## INDOOR CONSTRUCTION TECHNIQUES

This particular series was started in Jan. '70 INAV, and Part II - Wood Density appeared in Feb. '70 INAV. Due to a press of time upon your editor and on some of the invited contributors, the series had to be delayed. We now have two more "parts" on hand, and hopefully other parts will come in as these are presented. Jim Richmond agreed to comment on motor sticks, since his sticks are both longer and lighter than most others now being built.

### Part III - The Motor Stick

by Jim Richmond

In order to build light motor sticks, it is necessary to utilize light, yet strong materials in such a way that a minimum quantity does the job. The motor stick blank is ordinarily heavier than the bare wing frame and two or three times as heavy as the prop spar. As the heaviest single component, the motor stick becomes the major influencing factor in total model weight. Because of this, I have made extensive efforts to minimize motor stick weight.

I have tried a single solid stick braced with wires for both torsional and bending stresses. Also, built-up structures were tried. In addition to excess drag, the major problem with these approaches is that they are utterly dependent on each and every stick and glue joint. The failure of any one results in instant destruction of the entire model, as I learned the hard way. The rolled tube has proved to be just as light as any other structure for this application, and it is much more forgiving and dependable.

Selection of good wood for the motor stick blank is of paramount importance. Above all, it must be light, preferably 4 lb/cu. ft. density. It must also be "C" grain, free of defects and exhibit a reasonable degree of stiffness. Stiffness can be checked in a relative manner by holding the ends of two sheets side by side on the edge of the work bench to see which one bends the least under the influence of its own weight. The size of the wood depends on its application, but my current recommendation for FAI models is .012 x .750 x 14, which weighs about .005 oz. Thicknesses from .010 to .0135 and widths from .675 to .875 have been used successfully in the past. Tapered blanks have been tried but are not recommended; strong ends are just as important as the center area.

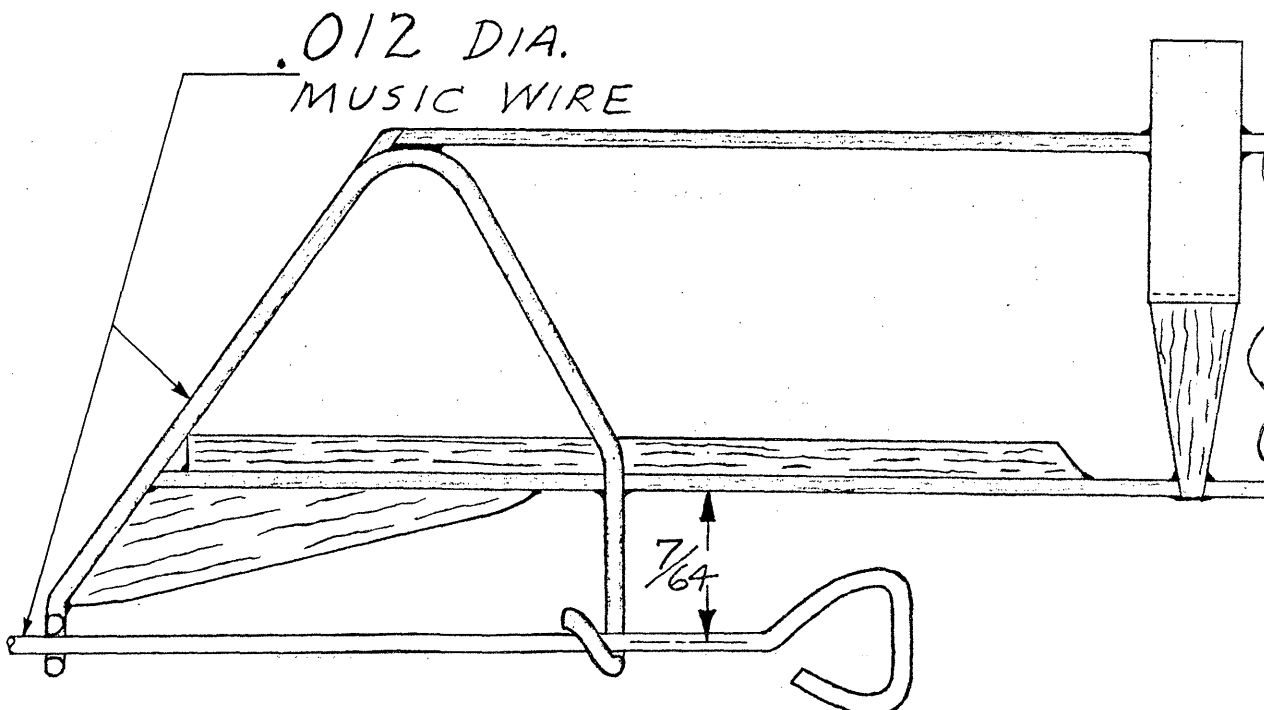
Double wire bracing is a necessity for a motor stick made from the above blank. I use a different bracing method on each new stick, but I like the current one which simply consists of a balsa "v" mounted on each paper wing mount tube with .001 nichrome strung over the ends of the V's and attached at each end of the stick. A motor stick without bracing must be larger and heavier to withstand the bending stresses, so bracing is used as an expedient to permit the use of lighter material.

Cementing the seam of the rolled tube can add a lot of unnecessary weight if it is not carefully done. Cement is needed only in the seam - not all over the surrounding wood. In order to get the cement into the right place, I apply it with a jeweler's fountain oiler, which is simply a small glass tube with a small hypodermic needle-like metal tube in one end. The business end is carefully rounded to prevent scratching the wood. A magnifying eye loupe is used to observe the flow of cement. The fountain oiler is filled by sucking cement up into it, and it is blown out and washed with thinner immediately after use.

The rolled tube should be carefully examined for any weak spots or areas. Any weak areas in the tubular shape (detected by careful squeezing) can be strengthened by running a piece of 1/64 sq. balsa through the tube and cementing it at both ends. I like to use the strongest end of the tube for the front of the motor stick due to the handling abuse expected there. I glue a .025 sq. x 3/4 piece of balsa on the inner bottom surface of both tube ends. This aids in preventing buckling and serves the same purpose as the vertical web used by others, but it is much lighter. The position of the glued seam doesn't seem to matter much, but I think I like it on top better since any weak spots are less likely to cause trouble there. It is desirable for the tube to bow downward prior to bracing in order for the tube to have tight wires. The desired bow can be induced by slipping the tube over a pre-bowed hardwood dowel and baking it at about 200° F (be careful).

The double prop bearing and rear hook that I use are both made from .012 music wire. The double prop bearing is bent in an inverted V shape with a closed loop on one end and a pig-tail loop on the other (see sketch). The closed loop is the front bearing, and it is ground flat on the front to provide a surface for the washer. The pigtail loop provides positive control of thrust angle and still makes it possible to attach and remove the prop. These loops are made by worrying them into shape with pliers. Sometimes it helps to insert a .013 wire through the roughly formed loops and then squeeze them into shape - this prevents the loops from closing too much and helps to make them round. The openings can be enlarged and rounded with a careful application of a .013 drill. Both the front bearing and the rear hook extend all the way through the motor stick to provide attachment points for the bracing. The combined weight of both bearing and rear hook is only .0008 oz., but if you are really fussy (as I am sometimes) you can make them out of aluminum or titanium and reduce the weight even more. The complete motor stick with everything on it should weigh between .007 and .008 oz.

One last word - a sheet of wood that is a bit on the thick side or one that has thick areas can be corrected by careful sanding with a block on a large piece of glass. I suspect that sanding can weaken the wood, so use fine grit paper and take it easy. Also, you will probably find that the center area of a freshly sanded sheet is thicker than the edges, so trim off both edges - straight, please. Good Luck!



# INDOOR

## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

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

### New Members:

DAVID BEASLEY, MAG 32, VMA 324 Avionics, MCAS Beaufort,  
S. C. 29902  
GARY BRUNO, 1825 Holloway Rd., Holland, O. 43528  
JOHN W. GREGA, 355 Grand Blvd., Bedford, O. 44146  
THOMAS MAHURIN, 6409 Brookside Rd., Kansas City, Mo. 64113  
HARRY STUNE, 637 Maye St., Westfield, N. J. 07090

### Honorary Members

RAY MONKS, 232 Westwood Rd., Sutton Coldfield,  
Warwickshire, England  
OVE PETERSSON, Ganglatten 25, 421-46 Vastra-Frolunda,  
Sweden  
STAN WADE, 39 Beacon Dr., Loughborough, England

### Financial Report

With this issue NIMAS begins its tenth year, and it is still growing, though not as fast as the last two years. The average circulation for 1970 (Nov. '69 thru Oct. '70) was 289 - a 3% increase. However, the average for Sept. and Oct. '70 was 298, and the member listing above shows that circulation is rising again. Income for the year was \$845.30, and expenses totalled \$825.46. The expenses are as follows:

Producing INAV	\$353.06
INAV Postage	235.88
Correspondence postage	103.52
Supplies & other expenses	102.98
Special Action Committee	30.02
	<u>\$825.46</u>

Each issue requires about 65 hours of effort, counting the help of family members on mailing nights, and all help donated by draftsmen and other contributors. This doesn't include time spent in correspondence, which totalled 706 pieces incoming, and 1046 pieces outgoing.

### Junior NIMAS Awards

SILVER CAT. II RUBBER AWARD - 18:26.1, Tom Sovo

### SPECIAL INTERNATIONAL ISSUE

This issue is dedicated to those "honorary members" of NIMAS who reside away from the North American continent. These fellows now total 37 fliers in 19 countries, and most of them are faithful in reporting their activity. We appreciate these letters, and reader comments indicate a strong interest in international indoor activity. Thanks to all my friends overseas!

### FAI INDOOR REPORT

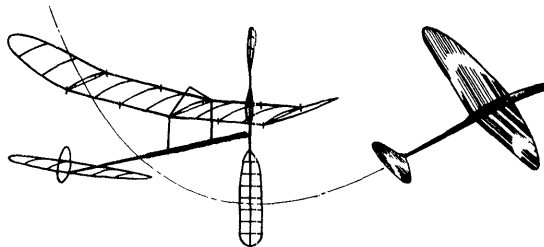
#### FAI Rule Change?

The CIAM will meet early in December, and will spell out rules for the models to be flown at the 1972 Indoor World Championship. These rules will be in effect during the U. S. team selection effort, so all who plan to fly will need to know. AMA HQ has arranged to send a copy of the CIAM meeting results to all who furnish a stamped, self-addressed envelope. If you want advance notice of the new rules, send the envelope to HQ right now! Every possible effort will be made to send the Dec. IVAV out shortly after word is received. However, our house is newly remodeled and still torn up, so no promise is made!

In recent weeks, the Hungarians have decided that the one gram rule should be "ironed out" as provisional rules to be sure it will have the effect expected, and will make such a proposal at the CIAM meeting. If this happens, the Champs will likely use the same rules as now are in effect for International competition.

#### Team Selection Program

The text below was submitted to AMA HQ for publication in Competition Newsletter, Model Aviation and AMA Charter



Club mailings. Most likely these publications will have the same thing, but the official version will be as published by AMA. The program is structurally quite similar to that used in 1969, but various inputs (Indoor Committee and Clarence Mather's questionnaire) indicated concern with the extremely tight schedule of qualification meets and excessive long distance travel. It is hoped that these problems have been alleviated to some extent in the new program, but the general nature of indoor flying prevents effective team selection unless a unified Finals is held.

### 1971 Program Details

Program Entrants: The Indoor Team Selection Program is open to all indoor fliers who have a 1971 AMA License and an FAI Stamp. Fliers chosen for the Team must be at least 14 years old by the time of the 1972 Indoor World Championship.

Program Structure: There are three levels of qualification: Local Qualification Trials, open to all program entrants; Semi-Final Trials, open to Local qualifiers and to certain others (see Qualification Requirements below); and Team Selection Finals, open only to Semi-Final Qualifiers.

Program Entry: The program may be entered two ways. First, fliers may send the proper fees to AMA HQ; each will be issued a program entry form which entitles him to unlimited attempts to qualify for the Semi-Final Trials, up to the Local Qualification deadline. Second, he may enter the program by paying the same fees to the CD of a Local Qualification Trial. All who qualify at any Trials will be issued a Notice of Qualification, while those who enter at a Local Trials and fail to qualify will receive a program entry form entitling them to continue to try to qualify.

CD Entry: CD's of Local Qualification Trials and Semi-Final Trials may fly in those events provided that two contestants or other officials time the CD's flights. The CD of the Finals may not compete in that meet.

### Qualification Requirements

Local Qualification Trials: Entry Fee - \$2 for Juniors, \$5 for all others. 75% of the entrants in each Local Trials will qualify for the Semi-Final Trials; also any flier whose score is 75% of the winning time for that Trials will qualify for the Semi-Finals. Program entrants who enter via AMA HQ may also qualify by entering a regular sanctioned AMA indoor contest. In this case, qualification is achieved by scoring 75% of the winning time in a regular contest event. The flier must use a model which qualifies for FAI Indoor\*, and qualification score is computed from the contestant's regular contest flights.

Special Note: Program entrants who would have to travel 200 miles or more to enter either a Local Trials or an AMA indoor meet may bypass the Local Trial level and enter the Semi-Final Trials by paying the entry fee. However, this action must be cleared through the Program Administrator, and the flier must have made entry via AMA HQ before the Local Trials deadline.

Semi-Final Trials: Entry fee - \$2 for Juniors, \$8 for all others. Two-thirds of the Semi-Final entrants plus all fliers who have 80% of the winning time for that Trials will qualify for the Team Selection Finals.

Team Selection Finals: The top three entrants in the Finals will represent the U. S. at the 1972 Indoor World Championships. Entry fee - \$10 for all entrants.

\*Specifications of the FAI Indoor model to be used in the 1972 Championships will be spelled out at the December, 1970 meeting of the CIAM. In general, models the same span or smaller than the FAI models will qualify if these models meet any other rules for FAI Indoor. (For example, Easy B models and Paper Stick models usually qualify.)

### Qualification Trials Schedules

Local Qualification Trials: An unlimited number of local Trials may be held in the U. S. between Jan. 1 and May 15, 1971. Each Trials must be sanctioned through normal channels as for AMA contests and have a minimum of four entrants as defined above. Each program entrant may enter

any or all the Local Trials he wishes, until he qualifies. Each Local Trials may be flown under any ceiling height, but must use full FAI rules except that rounds need not be flown. In the case of AMA contests used for qualification, AMA Rules shall apply and the qualification scores must be computed from the regular contest results. Note: Program entry for purposes of qualifying via AMA contests must be accomplished before the contest; the entry fee must be postmarked to HQ not later than midnight of the day before the contest. Program entry does not constitute entry into the contest.

**Semi-Final Trials:** At least four Semi-Final Trials will be held: one on the West Coast, one on the East Coast, and two in the Central U. S. In addition, any area at least 450 miles from a scheduled Semi-Finals may apply for a Semi-Final meet through the Program Administrator, provided this area has a minimum of five qualifiers who will enter such a Semi-Finals. Semi-Finals must be completed by July 15, 1971, and may be flown under any ceiling height. Full FAI Rules will be used, including the use of rounds. Each qualifier may enter only one Semi-Finals, but he can enter any Semi-Final in the country.

**Team Selection Finals:** All reasonable effort will be made to schedule the Finals reasonably close in time to the Nationals, but the program's need for an adequate site and sufficient flying time must override other considerations. A two-day Finals is planned in order to adequately accommodate the anticipated increase in Finals entry. FAI Rules will be strictly observed, and contest management will be patterned after World Championship practice so far as possible.

**CONTEST CALENDAR**

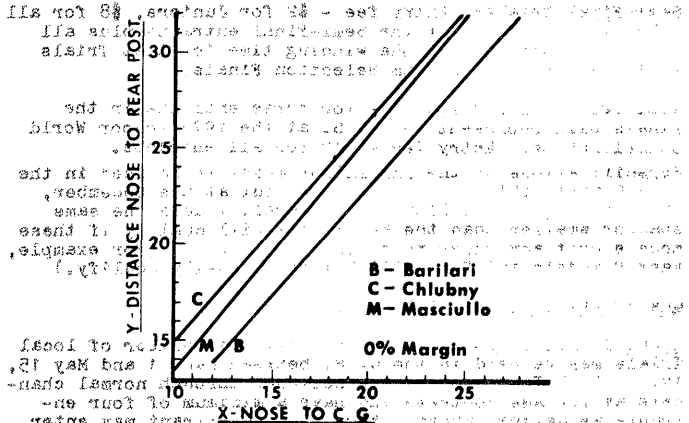
**MASSACHUSETTS - M.I.T. Indoor sessions at M.I.T. Army, corner of Mass. Ave. and Vassar St. in Cambridge, Mass. Jan. 9, Feb. 20, Mar. 20, 1971; 3:30 pm to 6:30 pm. Contest April 10, 1971, 1 pm to 8 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. 01778, ph. 358-4013.**

**NEW JERSEY - Lakehurst. Preliminary arrangements have been made to obtain Hangar #5 for Team Qualification Trials. Volunteer to CD or otherwise help by contacting: C. Vy. Russo, 143 Willow Way, Clark, N. J. 07066.**

**TEXAS - Mesquite. Indoor contest at Florence Community Center, corner of Linhaven and Oates Drive. Sponsored by Mesquite Mad Modelers; events: Paper Stick, Indoor Scale, HLG, Matchbox and 30 Minute HLG. Rules for Matchbox model ready to fly (including prop if model is powered) do not fit inside standard kitchen matchbox. 30 Minute HLG - each contestant receives one piece of balsa 2" x 6" x 1/32" and one piece 1/16" x 1/8" x 6". Model must be airworthy 30 minutes later, and no other materials except adhesive may be added, even for balance! The Mad Modelers strike again! Contest time 1:30 to 6:30 pm, Dec. 6, 1970. Paul Cardwell, 2633 Greenland, Mesquite, Tex. 75149, ph. 279-0516.**

**STATE OF THE ART**

This month we offer top models from three countries, and two of the three flew in the 1970 World Championship. Eduard Chlubny, from Czechoslovakia and Germano Masciullo, from Italy, were participants at the Champs, while Alberto Barilari, hails from Argentina. Full size prop outlines for their models appear on p. 3, and three-views on p. 4. A composite Stability Margin diagram appears below; as usual the chart is for 0% stability. Chlubny's model was trimmed at 0%, Masciullo flew his at +18%, and Barilari trimmed his to +25%.



**COVERING WITH MICROLITE**

Micro-lite is the new lightweight covering material sold by Micro-X, 5200 Seven Pines Dr., Lorain, O. 44053. Historically, the material is a relative of condenser paper which most of us are familiar with. That is, condenser paper has been used for years as an insulator in electronic components known as condensers or capacitors; Micro-lite is a space-age material which does the same job better. Micro-lite is a plastic film, identified in the electronics trade as polycarbonate film, and is somewhat lighter than the best grade of condenser paper. Since both materials are used as insulators, they are required to be continuous sheets (no holes, not even tiny ones!)

Charlie Sotich offers the following advantages and disadvantages of Micro-lite:

- Advantages**
1. It is lighter than condenser paper; weighing about .006 to .007 oz./100 sq. in.
  2. It is not affected dimensionally by humidity, and in fact is waterproof.
  3. It is strong and not easily punctured.
  4. It can be marked using waterproof inks, and can be "washed off" with thinner on a cotton swab.

- Disadvantages**
1. It tears easily once started.
  2. Special techniques must be used to get good covering jobs, since wrinkles cannot be removed by shrinking.
  3. Standard adhesives don't work very effectively.
  4. Micro-lite does not come in a variety of colors, so techniques must be developed where colors are needed.

Ron Martelet won Indoor Scale at the Nats with a large Pilatus Turbo Porter covered with Micro-lite. Scale markings were drawn on, and the overall effect was impressive. Ron relates the following step-by-step system for covering and finishing with Micro-lite:

1. Build a balsa frame 1" larger all around than the structure to be covered (1/4" x 1/4" is adequate).
2. Coat the frame with full strength rubber cement.
3. Unroll the Micro-lite on a flat surface and smooth out as many wrinkles as possible.
4. Press the coated side of the frame onto the film and cut out, leaving 1" border all around.
5. The film may now be tightened on the frame by lifting and pulling. Work from the middle toward both ends. CAUTION! The film can be made drum tight on the frame, but it will warp light structures after transfer.
6. If graphics are to be applied to the film (AMA number, club emblem, etc.), lay out the art work on paper. Place the framed film over the paper and trace the art work with "Pentel" waterproof pens. (Ed. note - Ron used photostats of aircraft details, enlarged to the proper scale to fit his model.)
7. Coat the structure to be covered with thinned rubber cement. Use two coats of cement thinned to be only slightly more viscous than water. Lay the structure on a flat surface, or otherwise support it so the area to be covered is accessible.
8. Line up the film over the structure and press the frame down lightly. Burnish the film down along the glue lines with a smoothly rounded balsa stick.
9. Cut the film close to the structure with a razor blade and burnish down any loose edges. Use a new single-edge blade for best results.

YEAH... I'VE BEEN FLYING H.L.G. FOR A FEW YEARS NOW. HOW'D YOU KNOW?

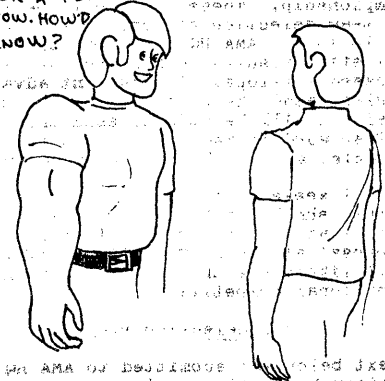
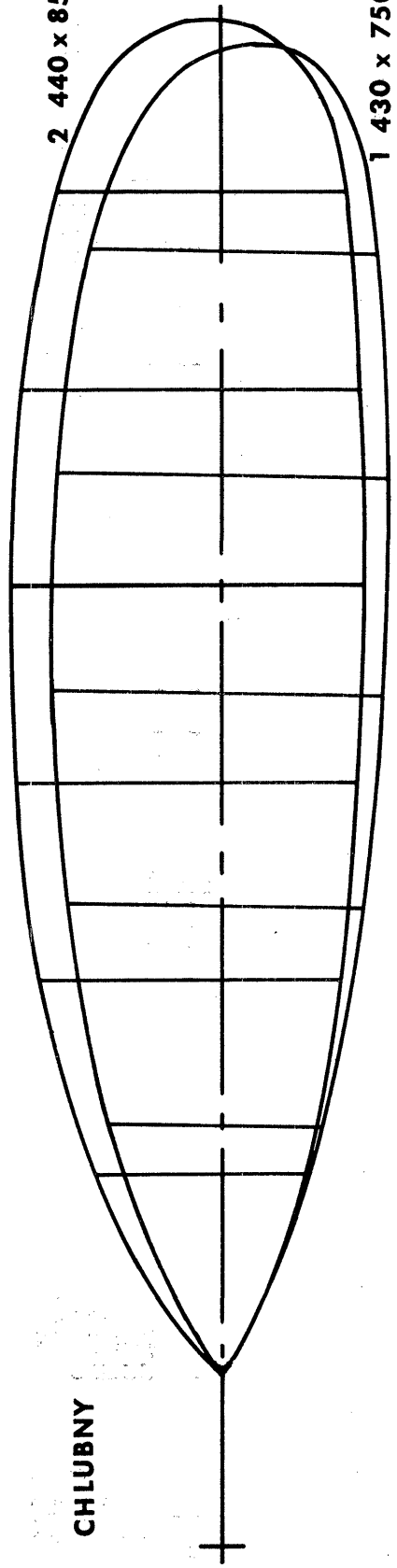
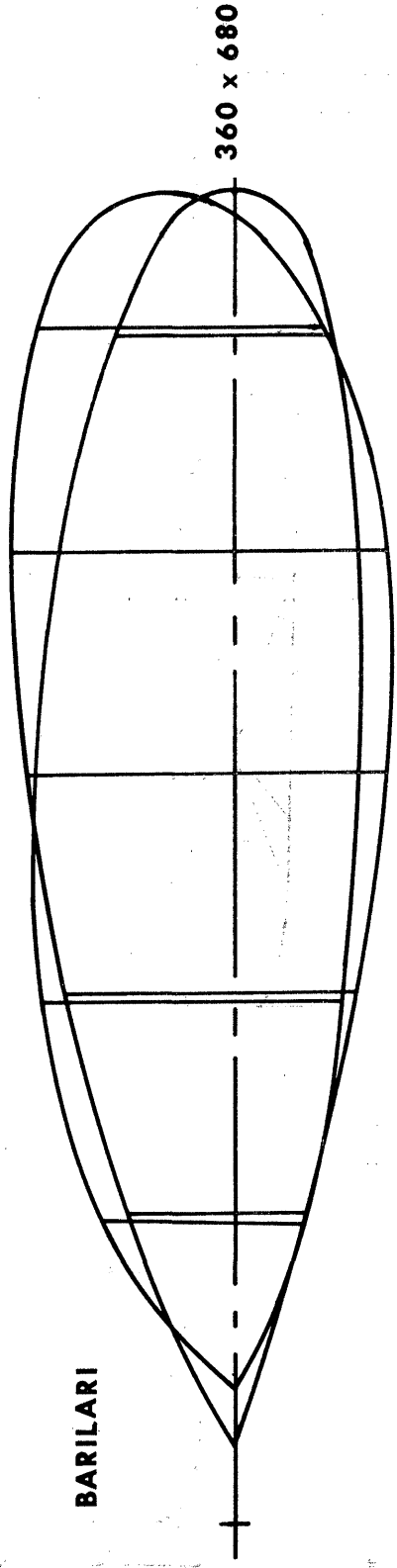


Illustration by Ron Martelet showing the 'before and after' of flying H.L.G. models.

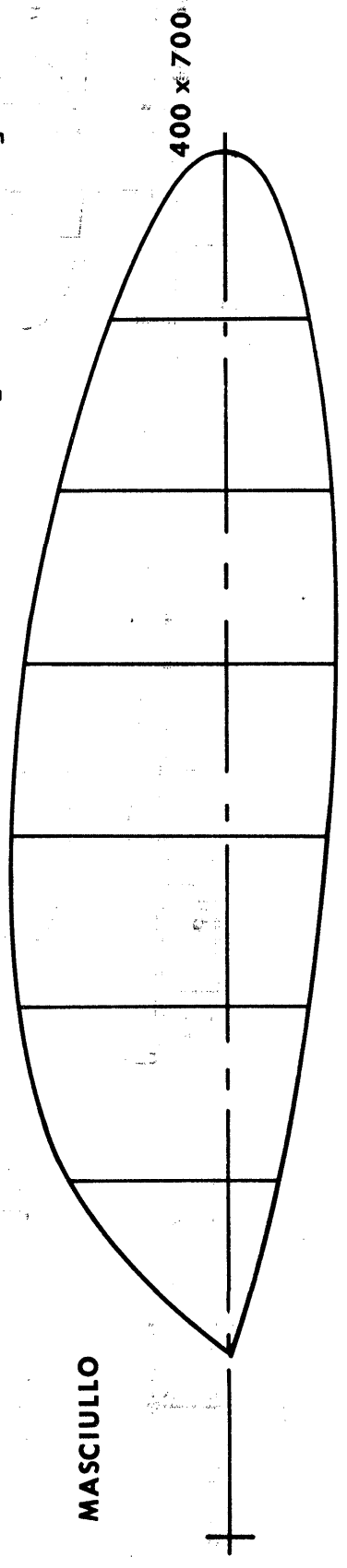
CHLUBNY



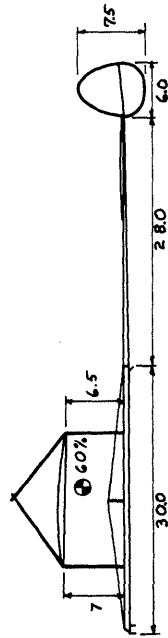
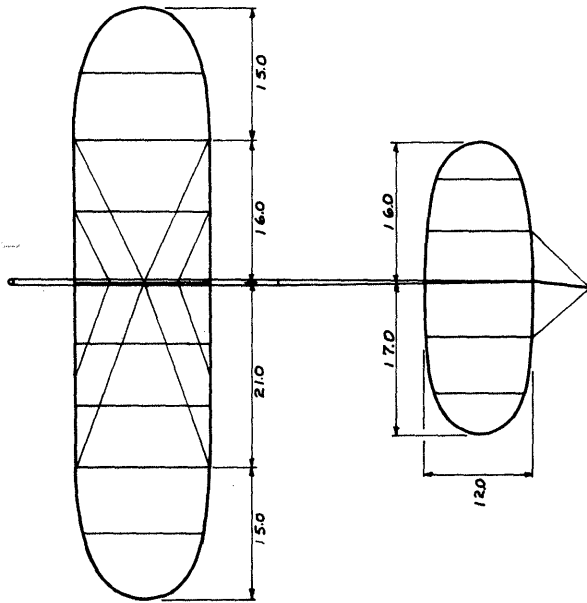
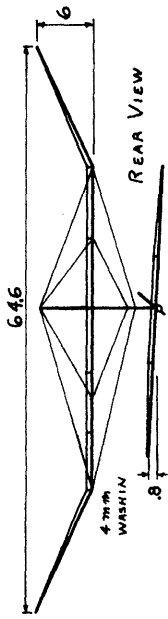
BARILARI



MASCIULLO



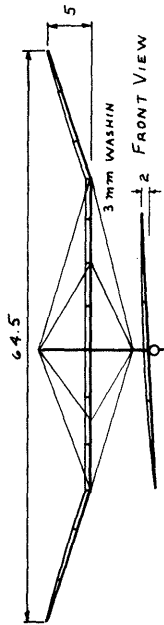
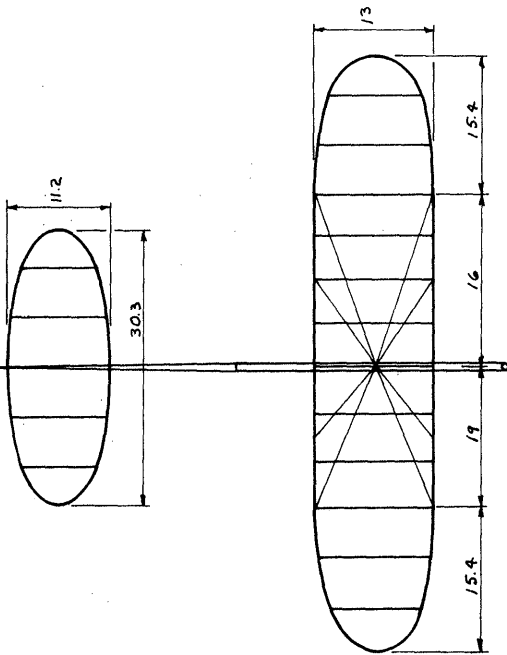
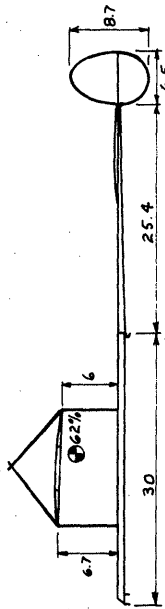
[All P x D in mm]



**CHLUBNY**

Prop #1 - 28:20 at World Champs  
 Prop #2 - 33:29 in 29 m hall in  
 Debrecen, Hungary.

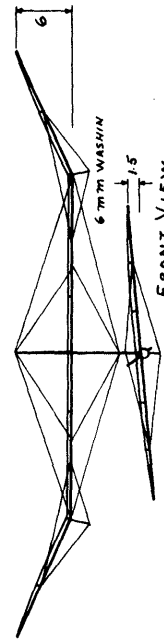
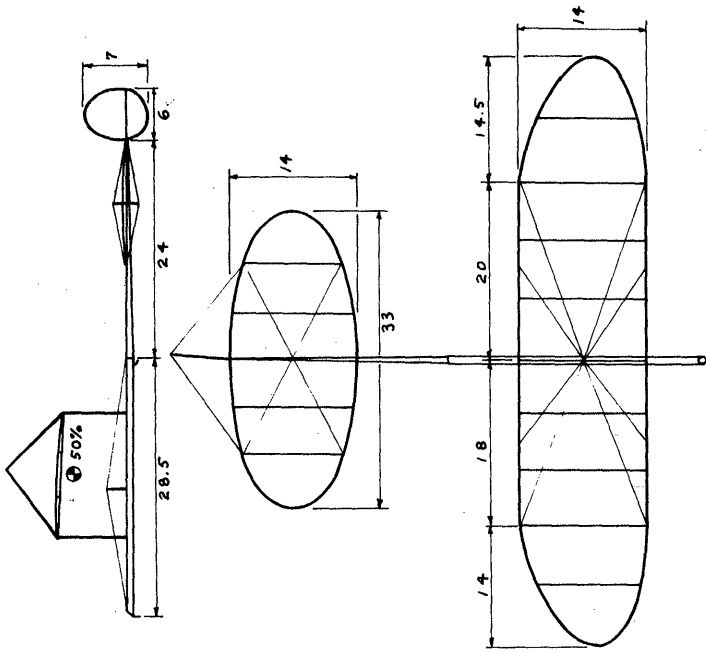
Prop	0.100 g	0.087 g
Stick + tail	0.348	0.283
Wing	0.205	0.205
Model	0.653 g	0.575 g
Rubber	0.740 g	0.730 g
Airfoil	(Debrezen) 4% Arc	(W. Champs) 3% Arc



**BARILARI**

(No weights or times furnished; Barilari has placed high at both the '69 and '70 Argentine Nats, presumably with this model design.)  
 A full size plan of this model is available for loan.

Prop	0.115 g
Stick + tail	0.340
Wing	0.245
Model	0.700 g
Rubber	0.150 g
Airfoil	3% Arc



**MASCIULLO**

(Prop outline p. 3 approximate)

Prop	0.115 g
Stick + tail	0.340
Wing	0.245
Model	0.700 g
Rubber	0.150 g
Airfoil	3% Arc
W. Champs time	23:10 on 1550 turns in 35 cm loop of 1 mm x 1.1 mm
Firelli	

# INDOOR

## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

### \*\*\*\*NATIONAL INDOOR MODEL AIRPLANE SOCIETY\*\*\*\*

#### New Members!

ELWOOD HEIVLY, 7 Overbrook Ave., Mystic, Conn. 06355  
LARRY RENGER, 910 Greenwood Ave., Canon City, Colo. 81212  
ROALD TWEET, Dept. of English, Augustana College,  
Rock Island, Ill. 61201

#### Honorary Members

JEAN GANIER, Delegeue General, Federation Francaise D'Aero-  
Modelisme, 52 rue Galilee, Paris 8, France

#### Recent Publications

A three-part article on an intermediate indoor model, written by Tom Vallee, begins in the Jan. '71 AMERICAN AIRCRAFT MODELER. The subject model is slightly larger than Easy B size, but uses advanced construction methods.

#### NIMAS Awards

SILVER CAT. I RUBBER AWARD - 11:06, Ned Smith

#### AMA Election

The recent AMA election is over, with a startling response - 20% of the AMA membership voted this time, a healthy increase over previous elections. Also, for the first time in years, the winning presidential candidate received a majority of the vote. This is partly due to nominations being limited to two this year, but there was also a write-in candidate to help divide the vote. The new AMA president is John Clemens; we feel that John will do his utmost to do a good job. It seems certain that he firmly intends to be responsive to the membership, which is a quality which has been lacking in this office for several years.

#### FAI INDOOR REPORT

##### One Gram Rule Passed

The following report was received from AMA HQ:

##### 1971 FAI INDOOR WORLD CHAMPIONSHIP RULES

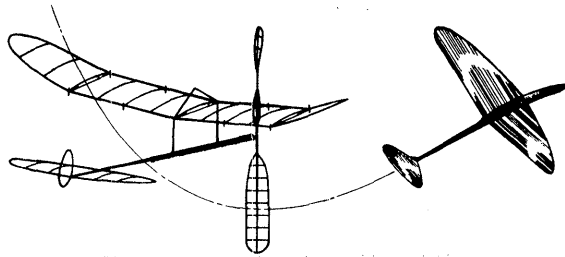
The just-completed meeting of FAI's Committee for International Aeromodeling (CIAM) voted that the "weight of model without rubber shall not be less than one gram". Otherwise, the specifications will continue as per the present rules.

John Worth's report from Paris (before his return to AMA HQ) indicates that the one gram rule passed by a vote of 10 for, 5 against, and 8 abstentions. He indicates that the U. S. tried to overturn the vote by challenging lack of a majority vote "for" (13 votes not "for"), but this was not accepted during the meeting.

The only hope for this decision to be changed is that the FAI Director General will check the record for precedents concerning this point of challenge. The check is expected to be made and announced in the minutes of the CIAM meeting - available about January 1, 1971. "It's only a slim hope," John says.

##### England Bids For World Championships

The following information has reached us second-hand: England was the only country to bid to hold the 1972 Indoor World Championship. If this proves to be official, Cardington (site of '61 and '62 World Champs) will be the site of the '72 Champs. At least two things could happen to change this; either England could withdraw the invitation, or another country could present a bid at the next CIAM meeting. In the event of two conflicting bids, past practice has been to accept that bid which, according to results of an informal survey, would attract the largest entry. The total entry is a crucial item, since a minimum of five countries must enter to qualify the contest as a



World Championship. Those who have followed FAI Indoor for that long will remember that the '64 Champs had to be cancelled for lack of entry (Cardington was the proposed site). If any World Champs is cancelled twice in succession, that event will be removed from the Champs schedule.

#### INTERNATIONAL CONTESTS

2ND Hadju-Cup International Contest - Aug. 17-19, 1970  
Kossuth University, Debrecen, Hungary (98' ceiling)

1. E. Chlubny	Czech.	31:46	32:34	64:20
2. R. Czechowski	Poland	32:05	31:42	63:47
3. Andras Ree	Hungary	31:43	30:47	62:30
4. J. Zolcer	Czech.	29:40	28:45	58:25
5. E. Ciapala	Poland	28:10	29:37	57:47
6. V. Niccoara	Romania	25:58	26:47	52:45
7. S. Bombol	Poland	27:17	25:02	52:19
8. Z. Ocsody	Hungary	25:52	26:10	52:02
9. Otto Hints	Romania	24:44	26:45	51:29
10. A. Moraru	Romania	26:02	25:25	51:27

This meet had no team competition, but two national Cat. III records were set: Ree's 31:43 is a new Hungarian record, and Czechowski's 32:05 is a new Polish record.

Championship of Budapest - Sept. 13, 1970  
Politechnical University, Budapest, Hungary (14.9 m)

1. Andras Ree	23:25	27:39	51:04
2. Antol Egri	24:09	22:19	46:28
3. J. Garzo	16:31	19:31	36:02

#### CONTEST CALENDAR

ILLINOIS - Chicago. Indoor sessions will be held each Sunday between Dec. 6, 1970 and April 25, 1971, with the exception of three Sundays to be announced later. Flying hours 9 am to 5 pm, and the site is the Forest View High School Gym, 2121 Goebbert Rd., Arlington Hts., Ill. Indoor contest, same site and time, Jan. 10, 1971. HLG and PennyPlane events. CD - Pete Sotich, 3851 W. 62nd Pl. Chicago, Ill. 60629 ph. RE 5-1353.

MASSACHUSETTS - M.I.T. Indoor sessions at M.I.T. Armory, corner of Mass. Ave. and Vassar St. in Cambridge, Mass. Jan 9, Feb. 20, Mar. 20, 1971; 3:30 pm to 6:30 pm. Contest April 10, 1971, 1 pm to 8 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. 01778 ph. 358-4013.

NEW JERSEY - Lakehurst. Tentative dates for hangar #5 or #6 - May 2, June 6, July 3-4, 1971. Contact C. V. Russo, 143 Willow Way, Clark, N. J. 07066

OHIO - Cleveland. Usual Great Lakes meet cancelled due to increase in rental of hall. AMA sanctioned Record Trials for all ages, held concurrently with Cleveland record trials for the normal youth events and age classes held at previous Great Lakes meets. Jan. 17, 1971, 11 am to 6 pm. Contact Chuck Tracy, c/o CLEVELAND PRESS, 901 Lakeside Ave. Cleveland, O. 44114 for more information.

OHIO - Painesville. Indoor sessions each Wednesday night at Painesville National Guard Armory. Contact Dick Smola, 650 Hoyt St., Painesville, O. 44077 ph. 261-354-8260.

TEXAS - Abilene. Cat. I Indoor contest planned late Feb. or early March in 25' site. Tentative events - Paper Stick, Easy B, HLG, Scale, Peanut Scale and (for Jr. only) AMA Cub. Contact Eddie Thomas, 5349 Harwood, Abilene, Texas 79605 ph. 915-692-5456.

TEXAS - Dallas/ Ft. Worth. Permission requested for use of ballroom at Texas Woman's Univ. in Denton, Texas on Jan. 31, Feb. 28, Mar. 28, and Apr. 28, 1971. Contests will be held, pending receipt of permission. Possible events: HLG, Paper Stick, Easy B or PennyPlane, AMA Cub. Bud Tenny or Jim Clem, 8240 Green Hollow, Dallas, Texas 75240 ph. 235-4603.

VIRGINIA - Hampton. Cat. I Record Trials, Jan. 2-3, 1971 at Willis School. Hal Crane, 4002 Buchanan Dr., Hampton, Va. 23369 ph. 703-723-0861.



## DESIGN FOOTNOTES

### The One Gram Model

This is being written before results of the CIAM meeting are known; it will therefore serve either as a source of ideas to design your own one gram models or as a report on previously constructed one gram models.

To begin with, there are many possibilities inherent in the basic concept of a model weighing a minimum of one gram. Normal indoor models are built to have the absolute minimum weight consistent with adequate strength for flying stresses and ground handling stresses, but optimum one gram design will shift the emphasis. The average competitive model will have to be about 60% heavier, so the rubber weight will have to increase in similar ratio. A larger motor will call for a slightly heavier prop with perhaps slightly larger diameter to handle the extra power output. Due to the higher model weight, larger wing area will give lower wing loadings to minimize the higher speed a heavier model will need. The tail surfaces will thus be slightly larger and stronger.

To this point, natural design tendencies will have "used up" perhaps 25% of the extra weight required. Since the larger motor is required, a stronger (and probably longer) motor stick will yield both extra weight and some extra margin of strength. At this point, it would be well to consider any possible aerodynamic improvements which

add weight but may increase flight efficiency. Some designers will include gadgetry such as gears, but they should be sure that such additions do not decrease the new reliability inherent in the properly designed one gram model.

The plan page shows three models now flying which are at least one gram in weight. The first model is by Bill Gibbs, and he used it to set the current Sr. AMA Cat. III record at 23:58.6. As a one gram model, it would actually be 10% overweight!

The second model, by Hal Crane, is also heavier than one gram. It has been flown extensively in the 20' site (Willis School) in Hampton, Va., spending the majority of each flight in ceiling scrubbing. The best time under these conditions has been 19:58, while the average time of 13 consecutive flights one weekend was 18:00. If 658 has been flown in higher sites, this is not reflected in the records Hal furnished.

Bob Platt constructed the third model of the series, which has been an outstanding performer in Willis School. The first three flights on the model averaged over 20 minutes, and it holds the Open Cat. I Stick record (21:06.2), set at Willis School in April, 1970.

Very little prop data were furnished on these models but Crane's prop was believed to be 17.5 x 30, and Platt used an 18" prop.

Certain other developments and ideas have come to light in recent weeks. For example, Richmond is reported to be trying a 10" chord, and Rodemsky has settled on 8" chord with fairly blunt, rounded tips. Rodemsky also feels that wide chord indoor wings may have an optimum thickness, unrelated to the actual % thickness. Crane is building a 7.5" chord wing of 3/16" maximum thickness, or only 2.5% thickness. Previous results with wide chord, thicker airfoils led him to feel a lower thickness would be beneficial; each rib is also slightly stiffer, due to the reduced camber.

### PROP FORUM

#### Salt Mine Props

by Jim Richmond

The Salt Mine in Slanic, Romania is like no other indoor site in the world, and the props required to function well there have a most unusual and challenging job to do. They must haul the plane up 170 feet within 5 or 6 minutes before the motor's initial burst torque lets up, then run slowly enough during the next 35 minutes to keep from spinning off the rest of the turns. How do you make a prop that will do that? How do you determine the best size? How do you match it with the best motor? How do you solve these problems in a site that eats your planes faster than you can come up with the answers?

Such were the trials faced by your determined team last April. In addition to illness and midnight repair sessions, sleepless nights were spent wrestling with the "Problem of the Prop". Very little was known previously about the kind of performance to expect from a reverse flare prop, but now it seemed that this was the only kind that could do what we wanted. We needed low pitch for the rocket-like climb and high pitch for a low RPM cruise. The symmetrical prop did a fair job once (37 minutes) with a short loop. Climb altitude was OK, but it dead-sticked

when it was still half-way up. Reverse flare props were built and tried. Clarence had good luck with his. I used mine on my first official flight and the prop was doing fine. The only trouble was that the plane flew into a cave about 100 feet up the side of a wall and that was the end of it.

Some real brain-twisting was required to come up with the braced symmetrical prop shown. The answer to this one became an absolute necessity when the other two props shown were destroyed and lost on the wall. I had no more good wood to build more props or time to do it, so I had to find a way to make the ones I had do the job. Testing had proven one thing for sure: the diameter had to be 17" (as Kalina already knew and was kind enough to tell us the first day). The braced prop was originally 18" diameter but was cut down and the spar spliced as shown. The offset was used in an effort to encourage some reverse flare effect. The spar was strong enough and the bracing really added torsional strength. This prop was used on my last four official flights and I have no complaints - about the prop anyway. It proved capable of both high climb and long cruise; getting both these in one flight was my problem - with no help from the drift or the walls.

One thing was impressed upon me during our efforts in the mine - something about the set-ups we used was very right. In spite of the unusually bad air (and bad luck), it was obvious that 40 minutes was well within reach. If that was so, how much time could you do in a "normal" site with the right combination? Food for thought!

These props are really only of academic interest now unless another meet is held in a mine similar to the one in Slanic. Positive flare is the only way to go in a normal site unless you happen to have a plane that just won't get up.

The following remarks tie into the above from the fact that they were made by Jim shortly after his return from Romania.

The following are design changes I would utilize if we ever fly at Slanic again:

1. Use a 17 x 32 reverse flare or braced symmetrical prop.
2. Increase washin to about 3/8".
3. Use stronger wing bracing wire - .0007 karma instead of .0005 nichrome.
4. Make stronger motor sticks, stabs and wing posts.
5. Shift the CG forward to about 65%.
6. Shorten the wing posts about 1/4".
7. Use more left thrust and down thrust.
8. Design hooks to prevent deadstick motors from dropping off, which happened several times during test flying.
9. Hold stab tilt to between 1/2" and 5/8", since some problems occurred with too much and too little tilt.

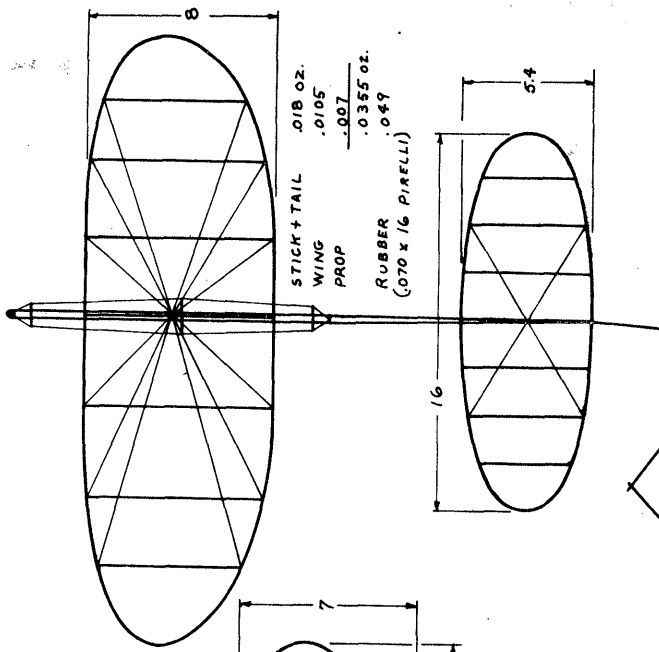
I plan to incorporate some of the above in future models so they will be able to handle a power burst without getting into trouble.

### CHANGE OF PACE

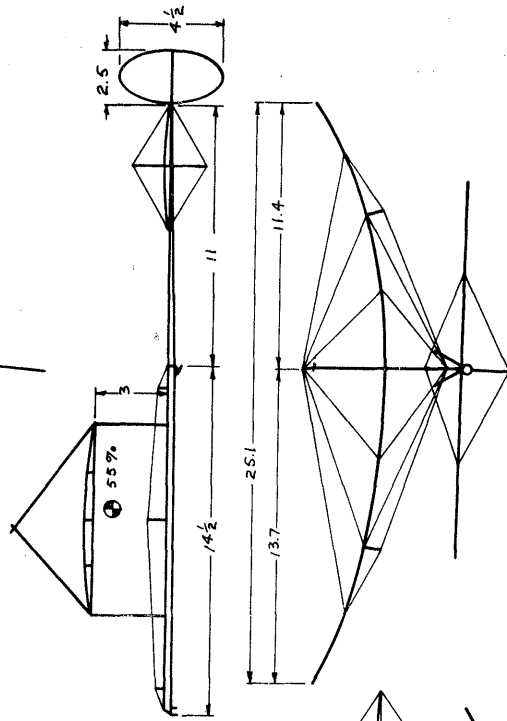
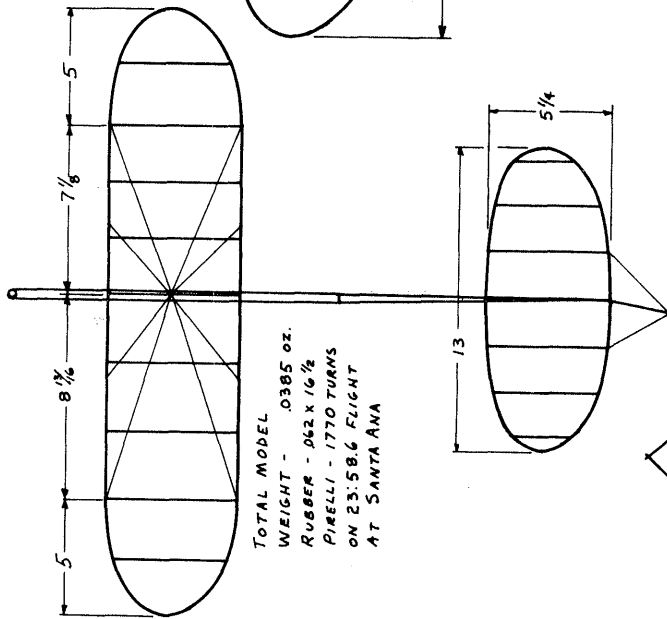
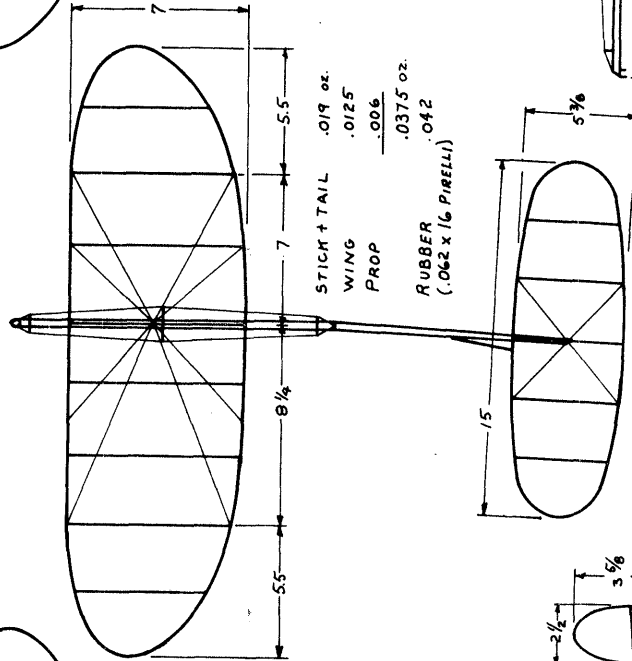
A recent missive from Bob Meuser contained the following tidbit:

You were probably just a wee tad at the time and don't remember, but us old guys used to fly Towline Gliders in the Gud Auld Dayes under the Junior Birdmen. There is one by Duke Fox in an old Zaic Yearbook. Every once in awhile someone mentions the old event and we decided to give it a go. Unfortunately, because of a conflict of schedules, not many showed up and only three actually flew.

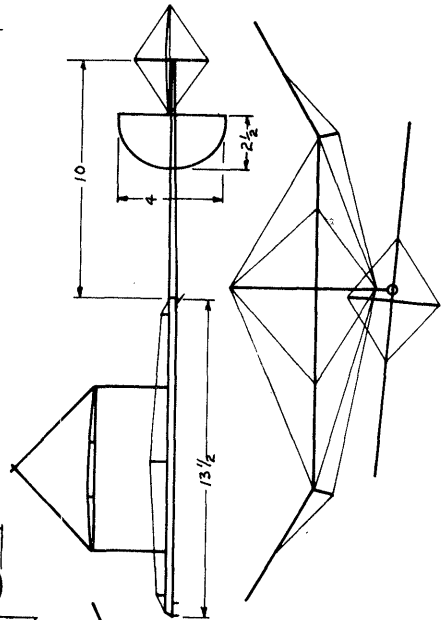
We flew in the Cow Palace. The portable seats and a rassing ring were all in place and the rafters were festooned with drapes which hung down 15 feet or so, and guy wires supporting the PA speakers ran the width of the hall at low altitude. We had to do sort of a Limbo Dance with our gliders to get under the wire, then run up one aisle, across the end and out under the balcony. The rules prohibited models larger than 300 sq. in. (it might as well have been an acre) and also prohibited microfilm (who needed it?). Bud Romak and George Foster built superlight models especially for the event - around 230 sq. in. I made some hasty repairs to a marginally stable and quite heavy paper stick model which had turned a cool 12 minutes using a .008 oz. balsa prop 30 years old. I had to add a few braces, but then I could tow quite fast and feel a good tug on the nylon-monofilament-sewing-thread towline - poor thing must have been pulling 20 G's - and also I added an adjustable offset towhook. The towhook was too far back and I was disinclined to move it. So I'd go up, do one loop, up again, and release. I suppose I got to 80 feet. Bud and George's models usually collapsed, but they only had to get half as high as mine to beat me. George finally got enough altitude to do the trick, but couldn't get the model off the line. I turned in half a dozen flights around 2 1/2 minutes to win the Oakland Cloud Dusters Leonardo Perpetual Trophy.



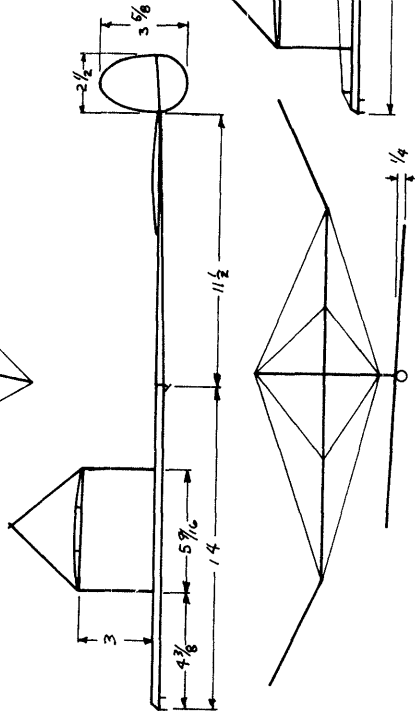
**CRANE  
"658"**



**PLATT**



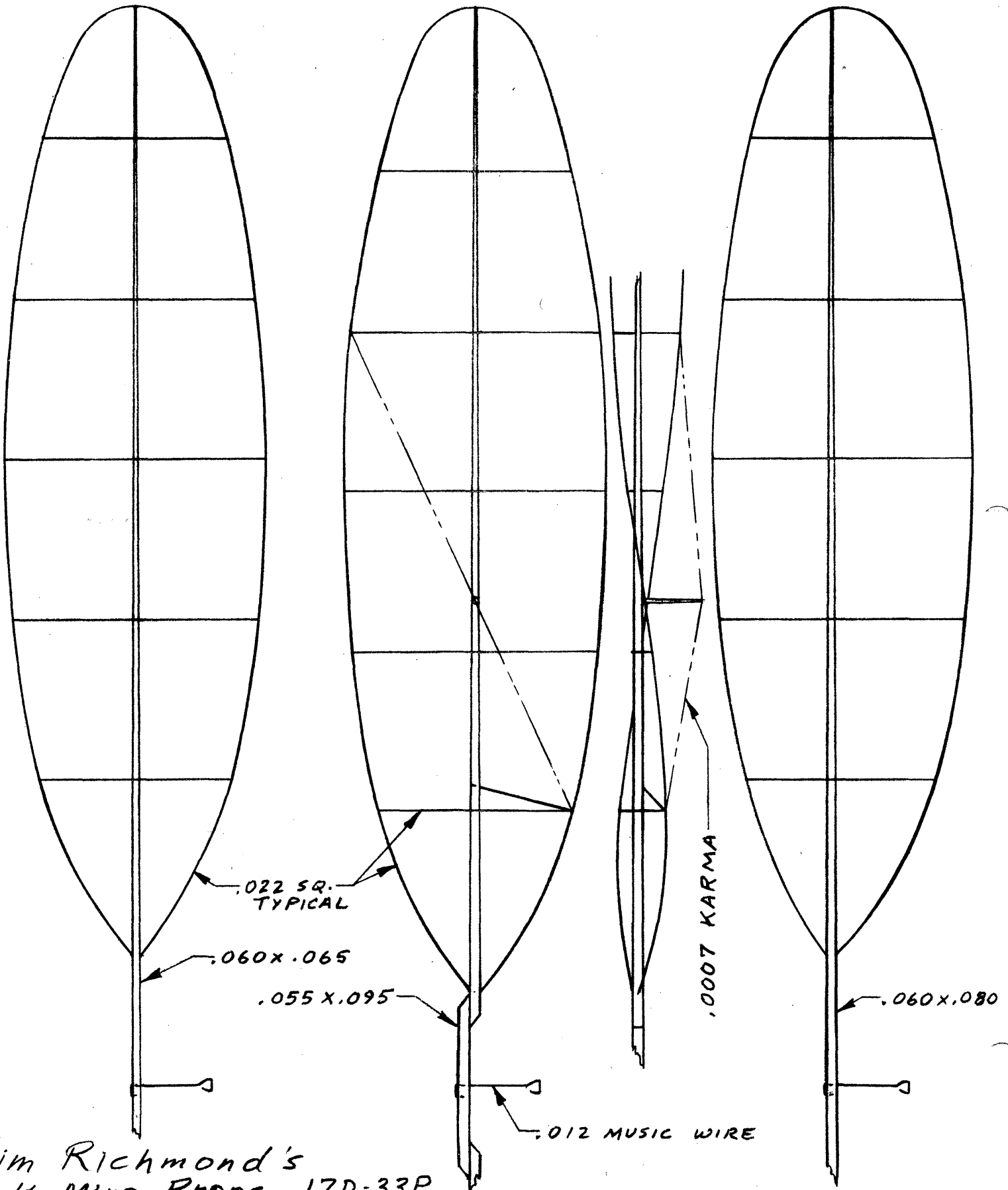
**GIBBS**



SYMMETRICAL  
.0033 oz.

BRACED  
SYMMETRICAL  
.0034 oz.

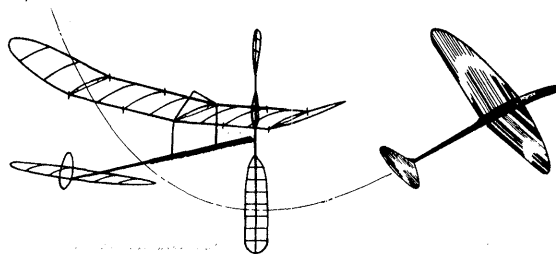
REVERSE FLARE  
.0034 oz.



Jim Richmond's  
Salt Mine Props 17D-33P

**INDOOR****NEWS and VIEWS**

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080



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

New Members!

HAL BLUBAUGH, 555 Moline St., Aurora, Colo. 80010  
 JERRY M. BRICKEY, 109 Pennsylvania Ave. Apt. 6,  
 Loves Park, Ill. 61111  
 R. W. CARLISLE, 706 Beacon St., Newton Centre, Mass. 02159  
 JAMES R. FIORELLO, P. O. Box 143, Barre, Mass. 01005  
 TED GONZOPH, 12996 East 2nd Ave., Aurora, Colo. 80010  
 RAYMOND E. MORRIS, 4431 Marlin Dr., Ft. Wayne, Ind. 46806  
 R. W. OBARSKI, 3353 Charring Cross Dr., Stow, O. 44224  
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 S/Sgt. F. E. SMITH 444 Ralph St., Apt. 323, Ft. Worth,  
 Texas 76108  
 ANDREW TOMASCH, 15641 Baintree Way, Mishewaka, Ind. 46544  
 DON WEINS, 19732 Bixby Dr., Cupertino, Cal. 95014

Help Wanted!

Several readers have written to request more information on indoor HLG flying. That includes plans, hints, comments, flying strategy, etc. Sure, the Sweepette is still winning, but other gliders are being flown and are winning. How about some plans?

NIMAS Awards

SILVER CAT. I RUBBER AWARD - 11:04, Fred Harlow  
 GOLD CAT. I RUBBER AWARD - 12:56, Fred Harlow

Scale Goodies!

Bill Hannan has announced that his new catalog "Plans & Things" is available for 25%. This booklet is a fascinating collection of illustrations, showing a wide collection of fun models, Peanut Scale models, Obscure Aircraft, and scale drawings of a wide variety of aircraft.

New Supplier

While aiding a local club in getting low cost indoor beginner kits, Jim Noonan bought materials in volume. He now has assembled a price listing of indoor parts, outdoor parts, and oldtimer items. Send a stamped, self-addressed envelope to Oldtimer Models, 7454 W. Thurston Cir., Milwaukee, Wis. 53218 to get a copy of the listing.

Postal Contests!

At one time, NIMAS members conducted a large number of postal meets, and the activity was coordinated thru NIMAS. Briefly, two clubs (or individuals) with similar sites would challenge each other to contests in specific events and exchange the results by mail. NIMAS Fudge Factors were then developed to give fairly equitable comparison between dissimilar sites, but not allowing for differences in flying conditions on specific days. This activity was responsible for many clubs having more fun with their indoor sessions, and getting to know club members in some other state (or country). It is interesting to note that recent postal activity has been nil (or unmentioned in letters to NIMAS), so what happened? Even the NIMAS Annual Postal meet participation fell off last year - are we too serious with our models and forgetting how to have fun at our sessions?

FAI INDOOR REPORTTeam Selection Program

The Team Selection Program which will name the 1972 U. S. Indoor Team opened on Jan. 1, 1971. A full text of the rules governing the Team Selection was printed in the Nov. '70 INAV, the Nov. '70 Competition News, and Feb. '71 AAM. A very important provision of those rules is aimed at those fliers not located in an area where FAI Indoor activity is high. Those fliers can enter the program by sending the proper fees (including \$1.25 for FAI Stamp if you don't have one) to AMA HQ. In fact, this is a good idea anyway - occasionally, a late-scheduled qualification trials will be unavoidably cancelled. Those who counted on entering the program at that event may be left out in the cold.

One Gram Model

At the time of this writing, all FAI Indoor models to be flown in U. S. Team Selections must weigh one gram less motor, and have wingspan equal to or less than 65 cm. It remains unlikely that the U. S. appeal of a less-than-majority vote will cancel the one gram ruling. (It was reported in Dec. '70 INAV that the vote adopting one gram was 10 "for", 5 "against" and 8 abstentions. Thus the "for" votes were a majority of those voting, but not of those present, and the ruling was appealed.)

Team Selection Trials Schedule

CALIFORNIA - Los Angeles. Local Qualif. Trials, Feb. 14, 1971, Santa Ana Hangar. Bob Randolph, 25145 Lawton Ave., Loma Linda, Cal. 92354, ph. 714-796-9706. All fliers who plan to attend must notify Randolph in advance due to security provisions at Santa Ana MCAS.

RECORDS? MAYBE!

A considerable number of AMA indoor records are now "up for grabs", since the adoption of the one gram rule and revision of AMA age groups. Specifically, the Junior age group now includes only those who will not reach age 15 by July 1, 1971, and Seniors are those who will not be 19 by July 1, 1971. Thus, all Junior and Senior records are open, and all U. S. FAI class records are open. Thus, the Brainbuster's Record Trials was timely:

BRAINBUSTER'S CAT. I. RECORD TRIALS - Jan. 2-3, 1971  
 Willis School, Hampton, Va. 20' ceiling.  
 Open FAI Cat. I FAI - 19:28.6, Bob Platt  
 Open AMA Cat. I FAI - 18:41.4, Hal Crane

The above flights were made with one gram models, and thus qualify for the 1971 record listings.

CONTEST CALENDAR

CALIFORNIA - Los Angeles. Cat. III Indoor Record Trials at Santa Ana hangar. Jan. 24, 1971. CD - Bob Randolph, 25145 Lawton Ave., Loma Linda, Cal. 92354 714-796-9706.

COLORADO - Denver area. Cat. I Indoor contests on Jan. 24, Feb. 21 and Mar. 21, 1971. For more info contact George Batiuk, 2945 S. Teller St., Aurora, Colo. 80227 or D. McGhee, 1260 Elm, Denver, Colo. 80220.

ILLINOIS - Chicago. Indoor sessions most Sundays between Dec. 6, 1970 and Apr. 25, 1971, 9 am to 5 pm, at Forest View High School Gym, 2121 Goebbert Rd., Arlington Hts., Ill. Contact Pete Sotlich, 3851 W. 62nd Place, Chicago, Ill. 60629, ph. RE 5-1353.

MASSACHUSETTS - M.I.T. Indoor sessions at M.I.T. Armory, corner of Mass. Ave. and Vassar St. in Cambridge, Mass. Feb. 20, Mar. 20, 1971 3:30 pm to 6:30 pm. Contest April 10, 1971, 1 pm to 8 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. 01778 ph. 358-4013.

NEW JERSEY - Lakehurst. Tentative dates for hangar #5 or #6 - May 2, June 6, July 3-4, 1971. Contact C. V. Russo, 143 Willow Way, Clark, N. J. 07066.

OHIO - Painesville. Indoor sessions each Wednesday night at Painesville National Guard Armory. Contact Dick Smola, 650 Hoyt St., Painesville, O. 44077 ph. 261-354-8260.

TEXAS - Abilene. Contest announced as tentative has been postponed indefinitely.

TEXAS - Dallas/Ft. Worth. Contests planned tentatively for Jan. 31, Feb. 28, Mar. 28 and Apr. 25, 1971, pending availability of site. Sanction request for Jan. contest listed Paper Stick, HLG, Catapult Glider and AMA Cub. All events have separate class for Juniors. Special rules for Catapult Glider: 4" maximum projected span, catapult furnished. For Sr-Op. AMA Cub: Must use standard Cub prop, and standard airframe shape and dimensions. Wood sizes and materials optional.

## DESIGN FOOTNOTES

### One Gram Follow-up

The Dec. '70 INAV presented a summary of reported one gram model activity, but neglected one important facet of the problems involved.

As might be expected, props and rubber choice will be very important. Primarily, our present prop design trends are pretty good, but a new balance of strength vs. flare will have to be settled by trial and error (as usual).

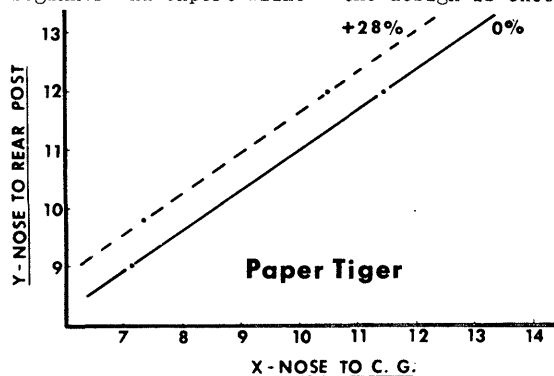
Of more importance will be rubber choice. The serious flier in tough competition must have the best rubber he can obtain, and be proficient in stripping a multitude of sizes. Several prominent fliers have done well in the past by using only standard available sizes of indoor rubber, but it is likely that this sort of flying will now serve only to find the right "ballpark". After the proper range of cross section is found, the proper loop length for a given site, temperature and conditions must be found by trial and error. It begins to be obvious that complete flight records will be helpful, since these records aid in judging just where to start under given conditions.

Locating good rubber will entail extensive testing. Some rubber tests have been printed in INAV in the past, and these will be repeated in future issues. Meanwhile, anyone who has a test that works well for them is invited to share it. Part of the test machinery that will be indispensable for meaningful testing (and flying) is a torque meter. One of the best designs for winding and testing is the design by Paul Crowley and Bob Bienenstein, which appears on page 38 of the Jan. '71 American Aircraft Modeler.

### STATE OF THE ART

Jim Richmond's "Paper Tiger" is the model of the month. It has won both the '69 and '70 Nats, and holds both the Cat. II and Cat. III Paper Stick records with 21:55.6 and 26:56.0 respectively. The model is similar in design and trim to Jim's FAI models, which were chosen as the #1 design in the NFFS Top Ten Models.

In our opinion, the model's success is due both to good design and Jim's careful attention to detail, both in flight trim and choice of rubber motor. The CMOS diagram below shows both 0% margin and the +28% margin which Jim flew the model with. This model is heartily recommended for beginner and expert alike - the design is excellent.



### LOW CEILING FORUM

#### Quick Trim Technique

by Hal Crane

First, balance the model in the normal way by locating the CG of the complete model without the wing. Locate the wing so the CG falls at the proper place with regard to the wing chord. For higher aspect ratio wings (6:1), use 80% CG, but for lower A/R (4:1) the CG may have to be as far forward as 50%. Install the wing sockets temporarily on top the stick, using a diagonal brace:



It is possible to trim and adjust the model alone, at home. Several tools and gadgets will be helpful including a winding stooze with the rapid unwind feature, a torque meter, and a scale for weighing. Wire O rings or safetied figure 8 hooks will ease the handling, at least for testing the model:



Be sure that your house has an EL-shaped living-dining room or the equivalent, not too cluttered with furniture. It is a great advantage to fly and adjust the model at home. I usually make a first attempt to trim by glide testing without the prop. Use clay ballast equal to the weight of prop and rubber and locate it slightly forward of the normal CG of the rubber motor. (With prop on and no rubber, a fairly well trimmed model will tend to mush rather than glide.) Start powered tests with about half winds on a motor of adequate size cross section. For scrubbing at Willis (20' ceiling) the motor will be shorter than for Cat. II or Cat. III flying. For Willis, the length will be about 1.1 or 1.2 times the hook span, before breakin. The weight of the rubber should be equal to or larger than the airframe weight.

Launch the model and check for a slight climb. If the wing has 1/8" or 3/16" incidence, adjust negative stabilizer incidence as needed (be sure that it is negative; that is, trailing edge up).

If the model looks OK for a normal launch, launch the model in a stall or near stall to check the recovery. Then launch slightly nose down to check recovery and then more nose down. If recovery is slow from a dive, increase negative stabilizer incidence. Checking trim at home seems to be a very quick method of getting a good adjustment.

Now repeat the tests at higher power. For example, wind fully and back off 200 turns, or use your torque meter to get a better measure of what you have done (the torque meter permits good repeatability of test values).

If the model cannot be trimmed to recover from both a stall and a dive, the wing should be moved backward perhaps half an inch to increase stability. Of course, a neutral point calculation would be desirable to increase the chances of getting the wing location right the first time. (Ed. Note - see "Constant Margin of Stability, Jan. '69 INAV or send stamped envelope for CMOS packet. Also, Hal published an improved neutral point method in the 1970 NFFS Symposium report.)

So far, we have been talking about pitch trim. The model should be adjusted simultaneously for circling. Willis is less than 60' x 60' so the circle must be less than 20' in diameter. Stabilizer tilt should be used to help maintain the circle under full power and prevent power stalling by forcing the tail around. Adequate dihedral, some wing offset and twist all help to maintain trim under high power. One limit we frequently approach at Willis is caused by the model skidding into a large turn under high power. A 50' turn can be a nuisance in a 60' site! Perhaps the best fix for skidding out of the turn would be increased dihedral on the outboard wing tip. A last ditch remedy is to increase the size of the rudder.

The trim technique described lets you arrive at the contest ready to make a fairly good flight. However, the nose may not be trimmed high enough to slow the model down for maximum duration. At Willis the model will then tend to speed up when flying near the ceiling and hit the lights harder than necessary. Worse yet, the model will also probably not recover if it touches a wall.

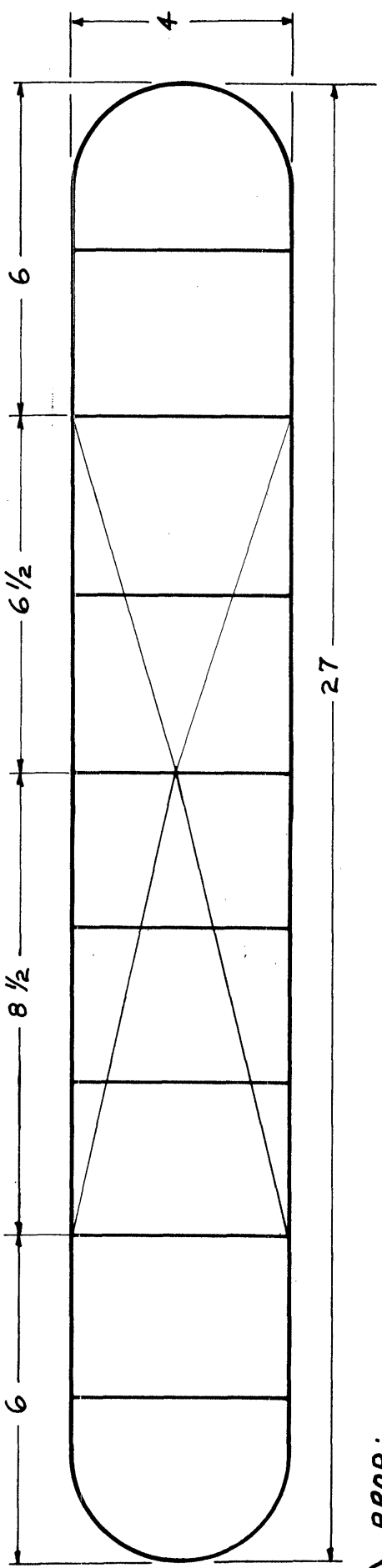
Nose high, or slow flight trim becomes even more essential at Willis, because besides increasing the possible duration, the slower flying model is more likely to survive long periods of scrubbing and bumping. Even more important, the model will tend to stall away from the walls. Drift toward a wall can then be tolerated with little or no need for steering.

To get better nose high, slow flight, trim, I would use moderate wing incidence and more negative stabilizer incidence. Under high power there will be more tendency to stall which can be relieved by using a slack bracing on the motor stick. This permits the rubber tension to reduce the negative stabilizer incidence and provide some downthrust. If trimming becomes difficult, it should also help to move the wing back perhaps half an inch to increase the stability.

This home-test procedure may sound complicated and time-consuming. However, it should be possible to do a good job in about an hour unless the wing has to be re-located. This hour can be very precious at the flying site or contest. Be sure to handle the model and rubber carefully during the testing!

Before we forget, after you are satisfied with the trim, it is desirable to bury the wing sockets in the motor stick. It is also helpful to mark the proper settings of incidence on the wing posts with a felt marker. Then you should be set to blast off, right out of the box, when the time comes. For the first flight, be a little chicken and back off a few turns to make it a safe one!

Jan 71

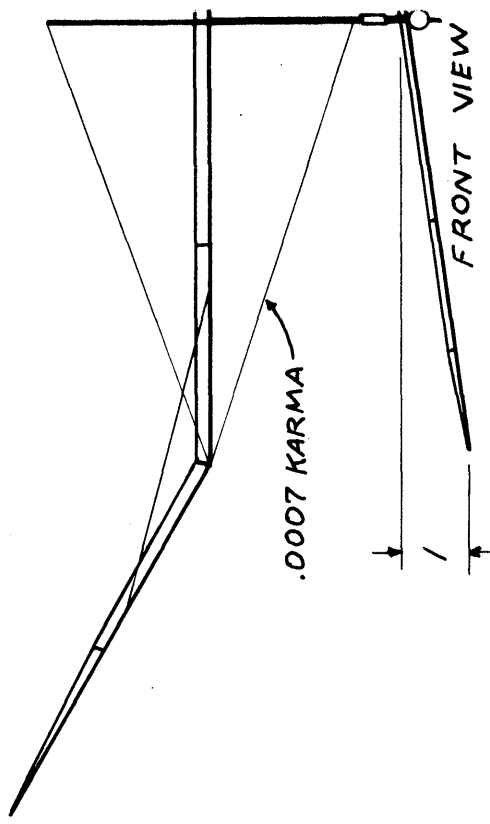
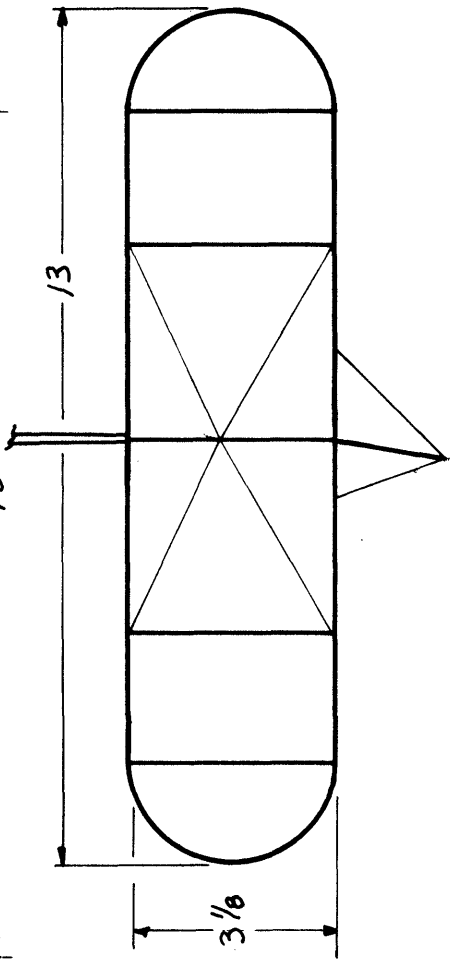
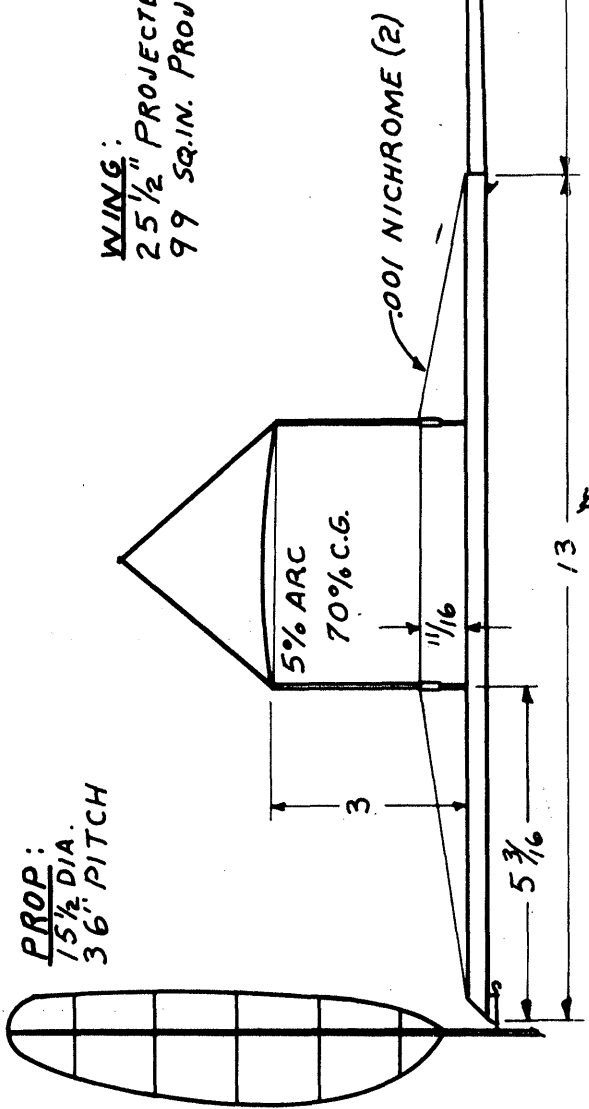


**PROP:**  
1 1/2" DIA.  
36" PITCH

**WING:**  
2 1/2" PROJECTED SPAN  
99 SQ. IN. PROJ. AREA

**WEIGHTS:**  
WING .0156  
BODY+TAIL .0150  
PROP .0050  
TOTAL .0356

**BEST FLIGHT:**  
21:55.6- CAT. II



PAPER TIGER by Jim Richmond

THE LAB

Artificial Aging of Rubber

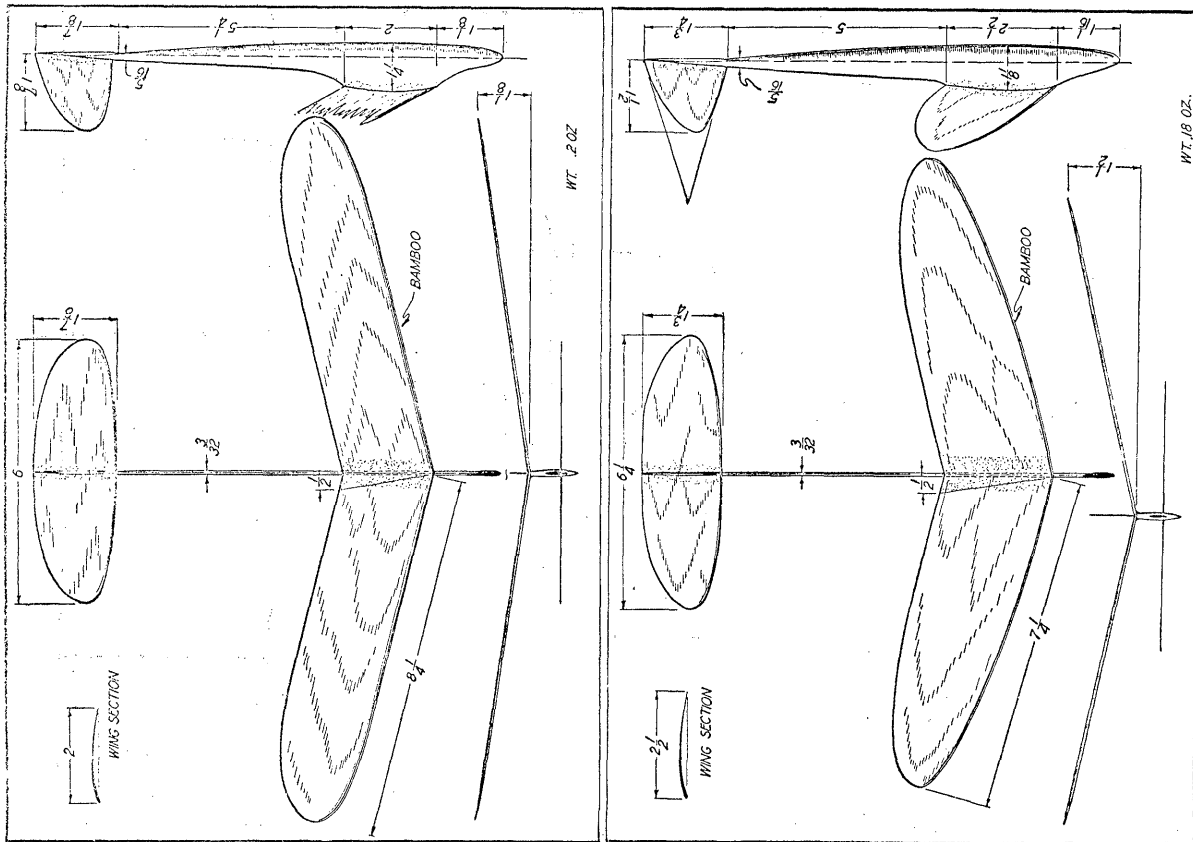
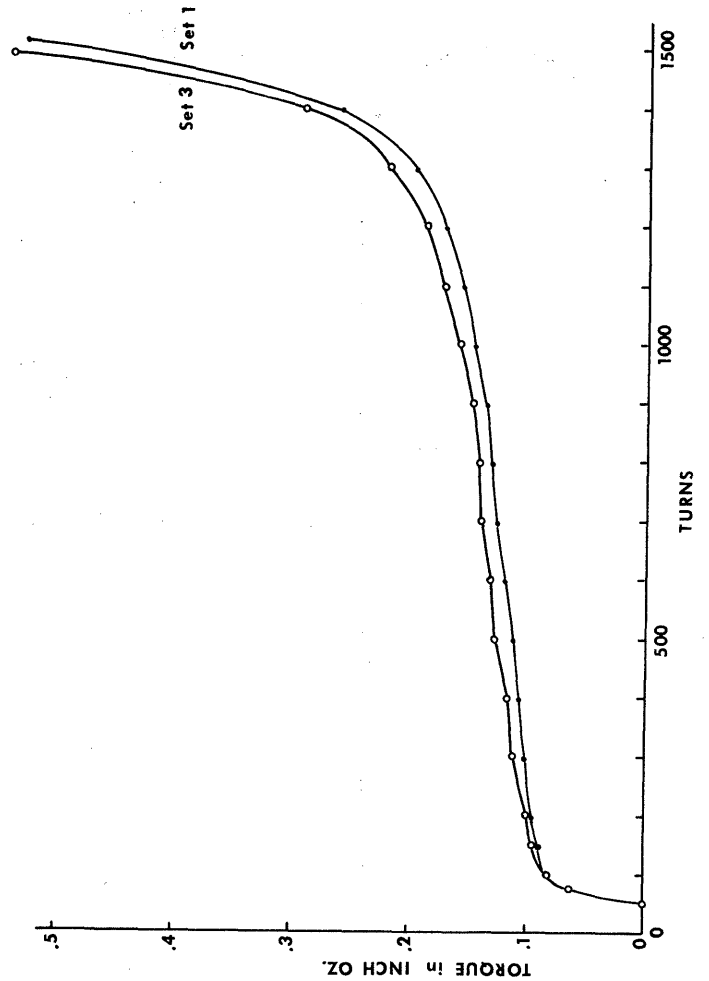
Quite some time ago (early in 1969) an ambitious program of rubber testing was initiated with the help of other fliers around the country. Some of the rubber samples broke under testing, a few of the tests never got started, and some of them were finished properly. To the dismay of the testing personnel, the laboriously generated data vanished into the NIMAS archives while waiting for more to come in. Out of sight-out of mind! Upon proper prodding, the missing data have been exhumed and part of it has presently been computer analyzed by Bob Meuser, and the plots below have been traced from computer generated plots. Each plot is the average of identical tests performed on each of three motors from the same batch, with identical handling and break-in procedures. In this case, the test was to examine change in characteristics of pirelli after storage at elevated temperatures.

Four complete sets of motors were prepared, and coded in groups of three. Set #1 was held as a control, while sets #2, 3 and 4 were subjected to storage at 120° F. for 48 hours, 96 hours and 144 hours respectively. Comparison of 12 graphs (for the third windup on each motor) showed the most interesting change to have occurred with set #3 (96 hours exposure), and this graph is compared to the graph of set #1 (control) below.

Bob Meuser analyzed the results thus: "It appears that aging and prewinding both increase the energy storage for the same maximum torque. But if aging and prewinding decrease the torque that the motor can stand without breaking then the energy may not be increased. It would have been very interesting to continue the testing for several more wind-ups, ultimately winding to deliberate destruction as a measure of ultimate energy storage."

A LOOK AT YESTERYEAR

'Way back in 1938, Model Airplane News ran several features dedicated to explaining the differences between models for blimp hangars and for lower ceiling sites such as the various armory-type buildings then in occasional use around the country. Wilbur Tyler presented the two HLG models shown below as part of that series. At the end of the article, he concludes "A correctly constructed glider is good for about one second of flight time for every foot of effective flying height up to about 40 or 45 feet. Above 45 feet a glider is out of the low ceiling class and requires heavier wing construction."





**INDOOR****NEWS and VIEWS**

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

New Members!

DANNY AGGERS, 50 Pueblo Ct., Sayville, N. Y. 11782  
 DONALD F. BALKE, 191 Elm Rd., Inwood, N. Y. 11696  
 R. D. COONEY, 1381 N. E. Arrington, Hillsboro, Ore. 97123  
 P. CUTRONE, Richards Avenue, Norwalk, Conn. 06850  
 ROBERT DURIS, 279 Dayton Rd., Trumbull, Ct. 06611  
 CHUCK ERIKSEN, 14731 Lull St. Unit 3, Van Nuys, Cal. 91405  
 MIKE FEDOR, 1926 Ballaway, Grand Prairie, Tex. 75050  
 LEON J. FRIEDMAN, 112 Heatherstone Rd., Amherst, Mass. 01002  
 TIBOR GALL, 7650 Hwy 90W, San Antonio, Tex. 78211  
 HOWARD E. HEMINGER, 102 W. Montana, Glen Ellen, Ill. 60137  
 WALTER P. B. KULZER, 7309 Coronet Ave., Ft. Worth, Tex. 76118  
 GLENN R. O'ROAK, JR., Palmer Rd., Plympton, Mass. 02364  
 REX RECTOR, 707 Highwood, Greencastle, Ind. 46135  
 THOMAS K. SMYLY, 2190 Rosemary St., Simi, Cal. 93065  
 HOWARD M. THOMAS, 275 Belmont Ct. W., N. Tonawanda, N. Y. 14120  
 LARRY VINCEK, 1911 East 34th St., Lorain, O. 44055

Change of Address

Wayne Zink moved some time ago and wants his new address announced: R.R. #2, Woodburn, Ind. 46797.

As a reminder: any NIMAS member who moves and would like to have his new address published should note this on the change-of-address notice. We are happy to make these announcements, but they must be requested.

NIMAS Founder Honored

Pete Sotich, one of the seven co-founders of NIMAS, was honored last month by the Chicago Aeronuts Club at their annual banquet held Jan. 24, 1971. In a surprise ceremony, Pete was presented with an autographed sketch of himself and an engraved "Tissot" Automatic Calendar wristwatch. Pete was surprised and overwhelmed by the award - but it was well deserved. Pete's service to both the Aeronuts and to modeling in general is legendary. We join the Aeronuts in honoring Pete!

Prop Blocks?

Herman Adams, P. O. Box 491, Rome, Ga. 30161, has investigated the possibility of machine-carved indoor prop blocks, material to be soft pine. Anyone who would be interested should contact Herman; prices would depend upon the number produced. Coordination of orders for each specific pitch would be necessary.

Hannan Address

Last month we announced that Bill Hannan had new catalog sheets available, but listed no address! So: Bill Hannan, P. O. Box A, Escondido, Cal. 92025.

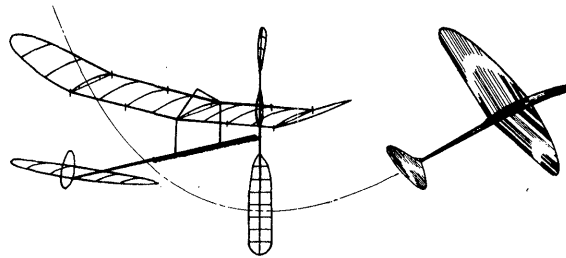
New Supplier

Need a torque meter, bracing wire, stainless steel straightedge, microfilm, motor stick or spar stock? These are a few of the items now being produced by Ron Plotzke, Jim Jones and Erwin Rodemsky. Their main item will be select balsa wood, with each sheet guaranteed usable on competition indoor models. Saw marks, hard streaks, thick or thin spots, or cracks will be reason enough for refund or replacement. For a price list, send a stamped, self-addressed envelope to:

Ron Plotzke  
 36659 Ledgestone  
 Mt. Clemens, Mich. 48043  
 Phone 313-791-9486

Nats Dates

The U. S. Navy has confirmed the dates of July 26 to Aug. 1, 1971 for the 1971 Nats, to be held at Glenview NAS just north of Chicago, Illinois. No announcement has been made of the indoor site or dates, but the indoor events most likely will be July 26 and/or July 27, 1971.



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

FAI INDOOR REPORTWeighing Of FAI Models

The following memo was made available to members of the FAI Indoor Committee and to AMA HQ for distribution to CD's of Team Selection Trials:

1. Weighing of all models at Local Qual. Trials can be performed at the discretion of CD's. Weighing of all qualifier models must be performed, either before the flight or after. The reason for quibbling at this point is because we have no weighing experience and no guideline for the best and safest (for the model) procedures. Bob Gibbs is planning to check a couple of types of scale and report on what seems best. If any others have comments or suggestions, please send them to me. Meanwhile, at the Santa Ana RT on Jan. 24, Bob weighed several models on a simple spring scale and said there was no difficulty. There was no ground turbulence to complicate matters, and if there is such turbulence, we may have to devise a screen to shield the weighing area.

2. All models shall be weighed before the flight at Semi-Finals and Finals. By that time we should have enough experience to be able to recommend the proper type of scale and the proper safeguards for the models.

3. If ballast is needed, it must be attached in a manner clearly intended to be permanent. Both AMA and FAI Rules are specific on this.

Team Selection Trials Schedule

CALIFORNIA - Los Angeles. Local Qual. Trials, Feb. 14, 1971, Santa Ana Hangar. Bob Randolph, 25145 Lawton Ave., Loma Linda, Cal. 92354, ph. 714-796-9706. All fliers who plan to attend must notify Randolph in advance due to security provisions at Santa Ana MCAS.

VIRGINIA - Hampton. Local Qual. Trials, Apr. 17-18, 1971 subject to site availability. Hal Crane, 4002 Buchanan Dr., Hampton 23369, ph. 703-723-0861.

Register Now

All fliers who plan to compete in the Team Selection Program are reminded that it costs no more to enter via AMA HQ, and this is insurance of being able to participate in the program regardless of site loss or other natural catastrophe! Simply send \$5 to HQ (\$2 for Juniors) and ask for a program entry form. If you don't have the FAI Stamp on your license, you'll need to buy that also.

CONTEST CALENDAR

COLORADO - Denver area. Cat. I Indoor contests on Feb. 21 and Mar. 21, 1971. For more info contact George Batiuk 2945 S. Teller St., Aurora, Colo. 80227 or D. McGhee, 1260 Elm, Denver, Colo. 80220.

ILLINOIS - Chicago. Indoor sessions most Sundays through April 25, 1971, 9 am to 5 pm, at Forest View High School Gym, 2121 Goebbert Rd., Arlington Hts., Ill. Contests on Feb. 28, Mar. 28 and Apr. 25, 1971. For more info contact Pete Sotich, 3851 W. 62nd Place, Chicago, ph. RE 5-1353.

MASSACHUSETTS - M.I.T. Indoor sessions at M.I.T. Armory, corner of Mass. Ave. and Vassar St. in Cambridge, Mass. Feb. 20, Mar. 20, 1971 3:30 pm to 6:30 pm. Contest April 10, 1971, 1 pm to 8 pm. Contest events: Indoor Stick - JSO; Delta Dart - Jr. only, HLG - JS & O; Indoor Scale - JSO. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass.

MASSACHUSETTS - Amherst. Indoor sessions each Sunday am at ballroom of University of Mass. Contact Leon Friedman, 112 Heatherstone Rd., Amherst, Mass. 01002.

MISSOURI - Kansas City area. Indoor contest sponsored by the Winged Motors of Kansas City and Midland Airfoilers of Olathe, Kansas. Meet 1s Feb. 20, 1971, 1 pm to 5 pm, at Olathe Jr. High School. Jr. Rubber, HLG, PennyPlane, Easy B, Indoor Scale. For more info, contact Roger Schroeder, 4111 W. 98 St., Overland Park, Kan. ph. 913-648-4265.

MISSOURI - St. Louis Area. Indoor sessions Feb. 21 and Mar. 21, 1971; contest Mar. 7, 1971 at Ft. Zumwalt High School, O'Fallon, Mo. Contest events - HLG, Delta Dart, Peanut Scale, Easy B, Indoor Stick. Contact Paul Tryon, 735 Riderwood Dr., Hazelwood, Mo. 63042 for times and other details.

NEW JERSEY - Lakehurst. Tentative dates for hangar #5 or #6 - May 2, June 6, July 3-4, 1971. Contact C. V. Russo, 143 Willow Way, Clark, N. J. 07066.

NEW YORK - Hicksville. LIAMAC Indoor meet, May 2, 1971, at Cantiague Park Skating Rink, Hicksville, L. I., N. Y. Paper Stick, Indoor Stick, Easy B, HLG, Indoor Scale. Contact J. G. Pallet, 30 Emerson Rd., Brookville, Glen Head, N. Y. 11545.

OHIO - Painesville. Indoor sessions each Wednesday night at Painesville National Guard Armory. Contact Dick Smola, 650 Hoyt St., Painesville, O. 44077 ph. 261-354-8260.

OKLAHOMA - Tulsa. Tulsa Glue Dobbers club meet or RT. Feb. 14, 1971. Contact Bob Dunham, Box 7151, Tulsa, Okla.

TENNESSEE - Manchester. Indoor contest Mar. 21, 1971, Manchester High School Gym, Manchester, Tenn. Paper Stick, Indoor Stick, HLG, Indoor Scale and Peanut Scale. Contact Ben Cleveland, 708 County Club Dr., Tullahoma, Tenn. 37388

TEXAS - Ft. Worth/Dallas. Indoor contest Mar. 14, 1971, 3 pm to 9 pm, Arlington Rec. Center, Arlington, Tex. HLG, Indoor Stick, Easy B, AMA Cub. Bud Tenny, Box 545, Richardson, Tex. 75080 ph. 235-4035. Cat. I site.

VIRGINIA - Hampton. FAI Warmup session, Mar. 6-7, 1971. Willis School, Cat. I. Hal Crane, 4002 Buchanan Dr., Hampton, Va. 23369.

VIRGINIA - Richmond. Flying sessions two Fridays each month in small Cat. I site. Contact Fred Harlow, 9724 Royerton Dr., Richmond 23228, ph. 701-262-9112 for info on place and time.

WASHINGTON - Seattle area. Indoor meets Feb. 27 and Mar. 27, 1971, 6:45 pm to 9:45 pm. HLG, Indoor Scale, Easy B. Contact Bob Stalick, 1120 Shady Lane, Albany, Ore. 97321 for site info.

#### INTERNATIONAL CONTESTS

Czech National meet, Z Hall in Brno, July 4-5, 1970  
Temperature 21 to 25° C, Humidity 40-70%

1. Edward Chlubny	33:38	28:14	61:52
2. Jiri Kalina	30:11	30:53	61:04
3. Jar. Jirasky	20:54	25:46	46:40
4. Tom. Weigert	20:25	26:00	46:25
5. Jan Hrdlicka	19:30	17:43	37:13
6. Rudolf Cerny	19:01	16:38	35:39

Third International meet, Z Hall in Brno, Oct. 31, 1970  
Temperature 14° C, Humidity 75%

1. Jiri Kalina	30:35	32:25	63:00
2. Karol Rybecky	30:02	30:53	60:55
3. Andras Ree (Hungary)	26:15	28:20	54:35
4. Eduard Chlubny	28:45	24:56	53:41
5. Rudolf Cerny	26:45	24:57	51:42
6. Josef Zolcer	24:01	27:40	51:41

Czech National meet, Z Hall in Brno, Nov. 7-8, 1970  
Temperature 8° C, Humidity 70%

1. Tom. Weigert	21:51	21:30	43:21
2. Karol Rybecky	25:10	16:32	41:42
3. Jiri Kalina	21:19	15:06	36:25
4. Jan Hrdlicka	21:10	14:55	36:05
5. Eduard Chlubny	21:47	10:58	42:45
6. Jar Jirasky	16:07	15:44	31:51

Final Results, Czech National Championship for 1970\*

1. Jiri Kalina	61:04	63:00	124:04
2. Eduard Chlubny	61:52	53:41	115:33
3. Karol Rybecky	60:55	41:42	102:37
4. Tom. Weigert	46:25	51:20	97:45
5. Jar. Jirasky	46:40	50:05	96:45
6. Rudolf Cerny	35:39	51:42	87:21

\*Placings in this competition may serve to choose the Czech team for 1971 International competition.

#### NEWS FROM AROUND THE WORLD

##### AUSTRALIA

After several years of wishing by Boyd Felstead and recent hard work by Boyd, Gordon Burford and others, the 1970 Australian Nats included an event for indoor stick. The site was small, about 30' x 70' with a 20' ceiling and numerous obstructions. Seven fliers entered, and Boyd won the event with 5 1/2 minutes. We can rejoice with Boyd as he says, "We have at last re-started."

##### CZECHOSLOVAKIA

Increased exhibition activity at Z Hall in Brno has reduced flying opportunities during the warm summer months and cold weather has taken its toll in reduced times. The U. S. PennyPlane event caught Czech fancy, so they have created a new Czech competition category P3. The rules: 450 mm span, 450 mm overall length, 250 mm motor stick length, Czech fifty heller coin (3 g) minimum weight. Score - best two of six starts.

##### ENGLAND

Laurie Barr is making a concerted effort to increase indoor interest and activity in England, with a three-pronged plan. He is stocking indoor supplies for the convenience of enthusiasts, he is making a concerted effort to find suitable flying sites, and he has written a very comprehensive handbook giving indoor building instructions and is getting the handbook published in FREE FLIGHT NEWS. The NEWS is a very well done FF newsletter, published by Ian Kaynes. Good luck to Laurie and his cohorts!

##### STATE OF THE ART

This month's offering could almost qualify for A LOOK AT YESTERYEAR - the Sweepette originated early in 1961 or maybe 1960; the product of painstaking cut-and-try testing and improvement. It has withstood the test of time, and remains a formidable contest threat in the hands of many experience HLG fliers. Thanks to Dave Linstrum and NFFS for this use of material from SYMPO 70.

##### RECORDS? MAYBE!

Indoor Airplane Record Trials, Jan. 17, 1971, Cleveland, O. Cleveland Public Hall, 80' ceiling.  
Open Cat. II HLG - 2:22.9, Bucky Servates  
Senior R.O.G. Stick - 7:35.0, Dale Hacker  
Senior Indoor Stick - 7:35.0, Dale Hacker  
Junior Paper Stick - 7:01.3, Tom Didovitsky  
Junior Ornithopter - 0:30.0, Susan Johnson  
Senior AMA Cat. II FAI, 8:13.0, Alan Szabo

Class A Indoor Contest, Jan. 31, 1971, Mesquite, Texas  
Florence Community Center, Cat. I, 22' 9" ceiling.  
Junior Indoor Stick - 9:24.0, Kristi Tenny  
Junior AMA Cat. I FAI - 9:24.0, Kristi Tenny  
Senior R.O.G. Stick - 2:45, Jim Haught  
Senior Paper Stick - 4:34.0, Jim Haught

Cat. I Record Trials, Jan. 20, 1971, Hampton, Virginia  
Willis School, 20' ceiling.  
Open AMA Cat. I FAI - 18:46.8, Hal Crane

Santa Ana Record Trials, Jan. 24, 1971, Cat. III  
Santa Ana Hangar, Santa Ana MCAS, California  
FAI Stick Record - 27:31, Bob Randolph. (This flight was made with a one gram model, but it is not known which record or records Bob filed on.)

The listing below appeared in the December Competition Newsletter, and the deleted portions are intended as a reminder of which records opened up as of Jan. 1, 1971.

##### NATIONAL AMA RECORDS--AS OF DECEMBER 21, 1970

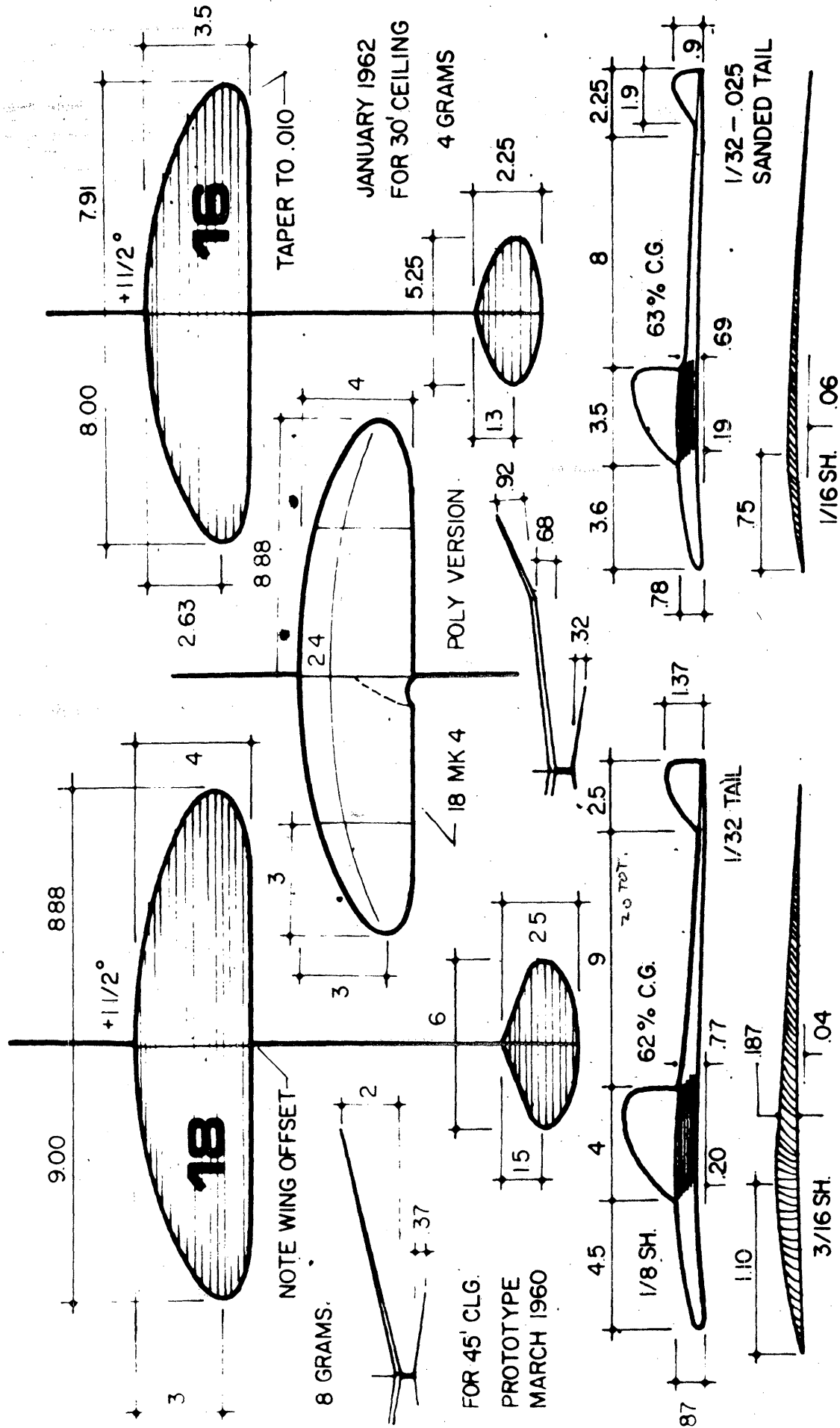
INDOOR, AMA CEILING CAT. I				INDOOR, AMA CEILING CAT. II			
Category	Age	Min/Sec	Held By	Category	Age	Min/Sec	Held By
ROG Stick	Jr.	2:35.2	Eric Jones	ROG Stick	Jr.	8:10.0	Don Schoenly
"	"	2:50.0	Larry Loueka	"	"	10:19.5	Larry Loueka
"	Op.	12:10.0	Hubert A. Entrop	"	Op.	15:53.2	Joseph F. Hines
Paper	Jr.	9:52.0	Robert Dunham, II	Paper	Jr.	15:30.5	Linda Randolph
Stick	Jr.	8:50.0	James Skinner	Stick	Jr.	16:45.6	Jan Servates
"	Op.	14:01.0	Robert Randolph	"	Op.	21:55.6	James W. Richmond
HL Stick	Jr.	15:20.0	Robert Dunham, II	HL Stick	Jr.	25:12.1	Linda Randolph
"	Jr.	14:56.0	Tom Newman	"	Jr.	25:50.0	Jim Skinner
"	Op.	21:06.2	Robert Platt, Jr.	"	Op.	34:57.0	James W. Richmond
ROG Cabin	Jr.	6:24.0	Robert Dunham, II	ROG Cabin	Jr.	11:52.4	Robert Dunham, II
"	Jr.	6:10.0	Nail Shipley	"	Jr.	14:06.4	Larry Loueka
"	Op.	17:49.4	Robert Randolph	"	Op.	20:25.0	James Richmond
Autogiro	Jr.	2:25.0	H. Schubeit, Jr.	Autogiro	Jr.	2:10.0	Harbert Schubeit
"	Jr.	2:40.5	Edmund Smith	"	Jr.	2:40.2	David Reback
"	Op.	4:19.0	Ronald Ganser	"	Op.	6:32.0	Walter Erbach
Helicopter	Jr.	4:33.0	Nickey Jones	Helicopter	Jr.	2:44.0	David Reback
"	Op.	10:36.0	Hewitt Phillips	"	Op.	4:30.3	Nickey Jones
Ornithopter	Jr.	0:52.0	Robert Postage	Ornithopter	Jr.	7:01.0	Thomas Vallee
"	Op.	3:50.1	Kenneth Johnson	"	Op.	3:44.0	Robert Postage
H.L.G.	Jr.	3:48.0	Robert Postage	"	Op.	5:15.2	Kenneth Johnson
"	Jr.	3:48.0	Robert Postage	"	Op.	2:14.4	Robert P. Gutai
"	Op.	1:18.8	Daniel C. Belleff	"	Op.	2:14.4	Robert P. Gutai
FAI Stick	Jr.	15:20.0	Robert Dunham, II	FAI Stick	Jr.	25:12.1	Linda Randolph
"	Jr.	11:06.0	Michael Feder	"	Jr.	20:57.0	William Gibbs
"	Op.	20:35.8	Thomas F. Vallee	"	Op.	34:57.0	James W. Richmond

##### INDOOR, AMA CEILING CAT. III

Category	Age	Min/Sec	Held By	Category	Age	Min/Sec	Held By
ROG Stick	Jr.	15:09.0	Arthur Saltzman	Ornithopter	Jr.	1:48.7	Robert Postage
"	Jr.	15:09.0	Raymond B. Haslan	"	Jr.	2:22.0	John Beck
"	Op.	21:52.0	Joseph Foster	"	Op.	4:30.5	Fred J. Weitzel
Paper	Jr.	21:07.0	Linda Randolph	H.L.G.	Jr.	2:00.0	Randy Richmond
Stick	Jr.	15:48.6	Raymond B. Haslan	"	Jr.	3:20.2	Arthur Mackenzie
"	Op.	26:56.0	James W. Richmond	"	Op.	2:50.4	Curt Stevens
HL Stick	Jr.	27:17.0	Bob DeStefano	FAI Stick	Jr.	11:02.0	Linda Randolph
"	Jr.	26:06.0	Bruce Norris	"	Jr.	23:58.6	William Gibbs
"	Op.	43:42.0	Ernest Kopschy	"	Op.	41:45.0	James W. Richmond
ROG Cabin	Jr.	14:33.1	Randy Richmond				
"	Jr.	14:33.1	Raymond B. Haslan				
"	Op.	29:06.3	Joe Bilgri				
Autogiro	Jr.	3:45.8	Edward A. Vargo				
"	Jr.	3:45.8	David Reback				
"	Op.	8:27.0	Fred J. Weitzel				
Helicopter	Jr.	4:30.0	Ernest Kopschy				
"	Jr.	6:45.6	Edmund Smith				
"	Op.	8:11.0	Hal Cover				

##### INDOOR, FAI CEILING--AGES COMB.

Category	C/H	Min/Sec	Held By
Stick	I	20:49.5	Thomas Vallee
"	II	19:16.8	Stan Chilton
"	III	34:57.0	James W. Richmond
"	IV	41:45.0	James Richmond



# THE SWEEPETTE

UBIQUITOUS INDOOR HLG LEE HINES CALIFORNIA

3-VIEW BY DAVE LINSTRUM NFFS

1035  
2800A

18

Does Rubber Get "Tired"?

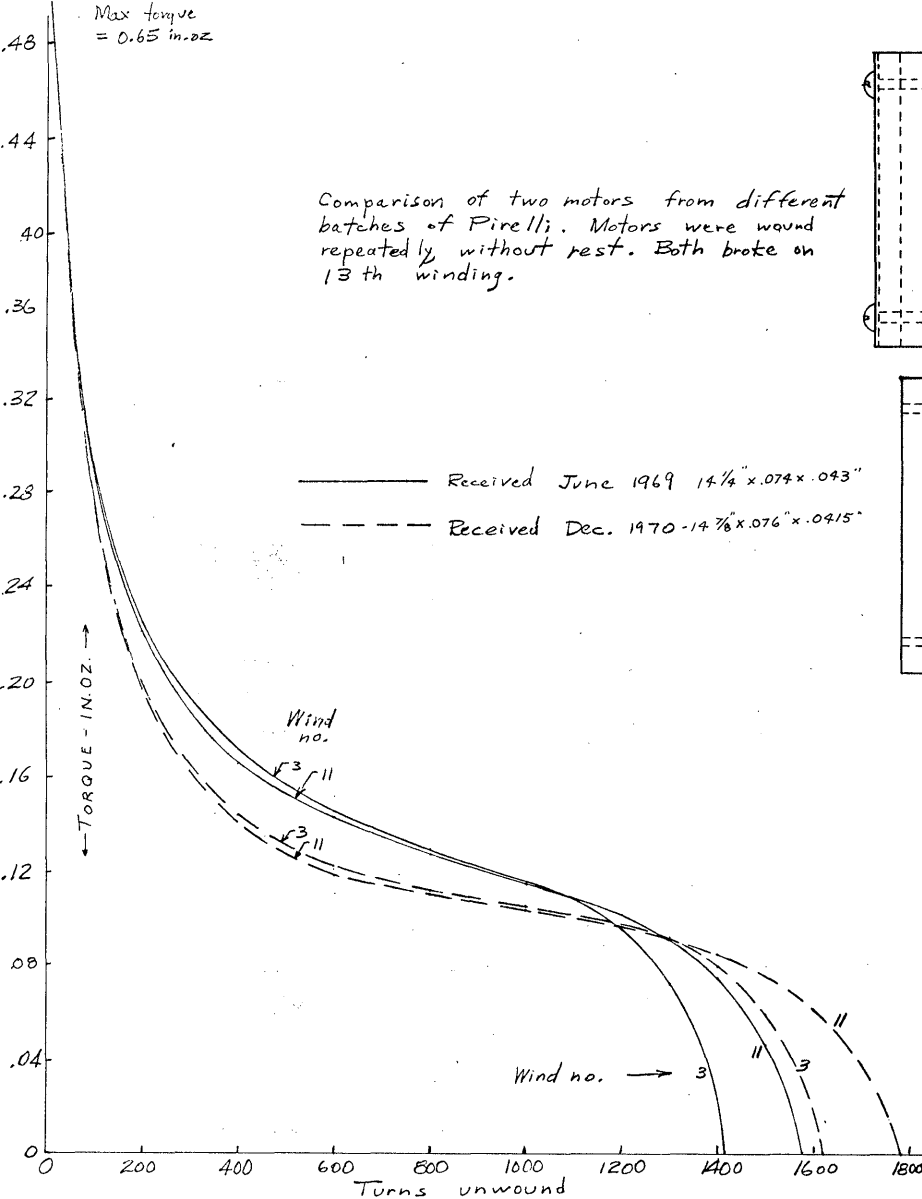
After hearing comments about "tired rubber" which seemed to conflict with his own experience, Bob Platt ran a test which is summarized in the curves shown below. Bob makes these remarks about the test:

"This is pretty similar to the tests I ran about three years ago where I measured torque curves for repeated winding of the same motor. These new data are taken for 11 winds with no rest between winds. There was no break-in before the first wind.

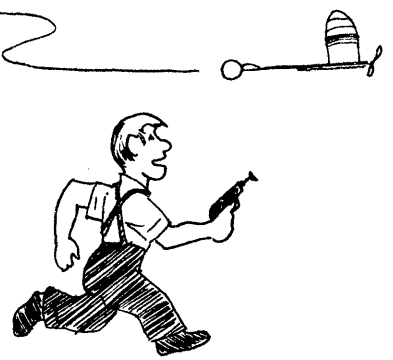
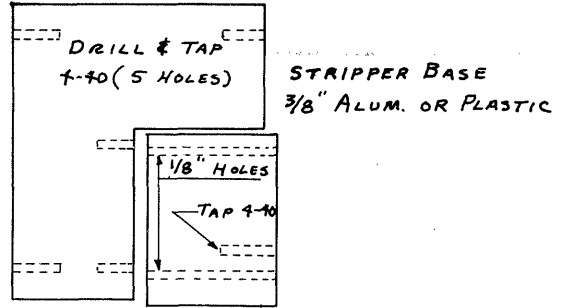
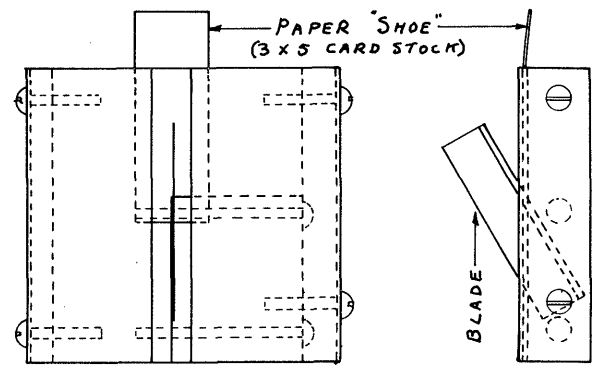
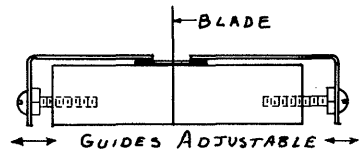
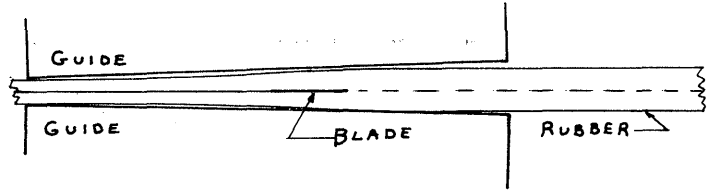
The torque curves are for two different motors, one from rather stiff, old rubber and the other from new and softer rubber of not particularly good quality. This plot is a comparison of the third and eleventh winds of each motor. All runs were wound to the same maximum torque.

As I see it, there is no real tiring of the rubber, for the area under the torque curve is greater for the eleventh winding than for the third winding in each case. There is a little change in the shape of the curve, giving a little lower torque for climb and cruise and more turns to compensate for this. This could be corrected by using a slightly lower pitch prop with a much-used motor, or more simply, by shortening the motor a little.

Note that the curves indicate that a motor is never completely broken-in; the number of turns it will take increases with each wind. This will complicate testing if you are trying to find the effect of some variable such as slack."



The drawing below was reprinted from an earlier INAV, and shows a stripper designed by Erwin Rodemsky. As with all pull-type strippers, its application should be to make an approximate 50-50 split in whatever width of strip you have (there is a minimum width of strip which can be cut, depending upon operator skill and luck). In later versions, the paper "shoe" shown below has been made from old movie film. The purpose of the "shoe" is to prevent the rubber from pulling down into the blade clamping channel and distorting the cut. The top part of the sketch shows how the guides should be adjusted closer together past the blade. This is important, since the rubber pulls out to a narrow strip past the blade, and the tapered cutting channel helps maintain even cutting.



# INDOOR

## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

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

### New Members!

- CHARLES H. ADAMS, 244 E. Sunset Rd., San Antonio, Tex. 78209  
 SAM CASEY, 3619 Wheeler, Apt. 232, Dallas, Texas 75209  
 HENRY H. COTTRELL, 10857 Larson Dr., Denver, Colo. 80233  
 J. JAMES DAVIS, c/o Great Northern Container, Box 948, Appleton, Wis. 54911  
 RICK FISHER, 165 King St., Weston, Ontario, Canada  
 JOHN P. KUKON, 14 Brandon Rd., Trenton, N. J. 08638  
 JAMES I. MILLER, 827 Yorkhaven Rd., Cincinnati, O. 45240  
 ARTHUR A. SLATER, 10 Broadview Dr., Commack, N. Y. 11725  
 CHRIS WEIR, 209 Coral Ave., Balboa Is., Cal. 92662

### Address Correction

In the Jan. '71 issue, Frank Parykaza's address was listed incorrectly; it is P. O. Box 43, Willingboro, New Jersey 08046. Sorry!

### Change of Address

Gerald Knoblauch has requested that his new address be announced, it is: 121 Hoskins Rd., Simsbury, Ct. 06070.

### Chuck Broadhurst

On Feb. 28, 1971, Chuck Broadhurst passed away in his sleep. Chuck was a NIMAS member, the Executive Director of NFFS, and AMA VP of Dist. X. In addition, he was a Specialty Correspondent (FF Power) for AAM. We will all miss Chuck and his most energetic support of many phases of our activity.

### FAI FF Qualification Trials

FF Team Program Director Dave Linstrum has announced that first-round qualification meets for the 1973 FAI FF World Champs will begin April 4, 1971 and can continue through Aug. 1, 1971. Most other aspects of the preliminary qualification sequence are identical to past programs with details of semi-finals and finals to be announced. In other words, get the sanctions set up! If you have any questions, contact Dave at 972 Plum Grove Circle, Buffalo Grove, Ill. 60090.

### New Catalog From Micro-X

Micro-X Products, 5200 Seven Pines Dr., Lorain, Ohio 44053, just issued their new catalog. Drop them a 6¢ stamp with your request - the catalog is mailed w/o envelope. This catalog lists several new items - silver microlite, Gitlow's indoor book, 16:1 winders and .0006 nichrome.

### Rubber Strippers Available

Bob Dunham's rubber stripper assembly line is starting up again. He sells Bilgri-type strippers which really work well, with a price of \$5.50 postpaid in the U. S. The deadline for ordering them is April 15, 1971; Bob's address is P. O. Box 7151, Tulsa, Okla. 74105.

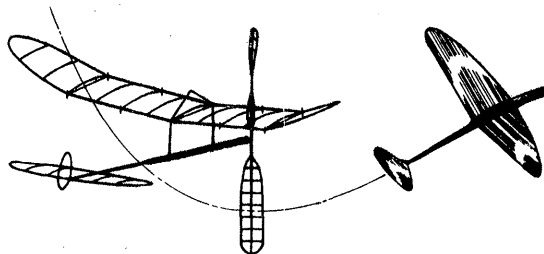
### New Product Wanted

It would be very nice if calibrated spacers were made available for Bob Dunham's strippers! Such spacers should be rectangular and large enough to support most of the area of the blades. A set of 7 or 8 spacers would permit sufficient variety of settings for anyone, and would make possible easy repeat cuts. Bob doesn't have facilities to make spacers but surely some NIMAS member does!

### FAI INDOOR REPORT

#### Qualification Via AMA Contests

Some questions have arisen about qualifying for entry in the Semi-Finals by flying in AMA contests. Basically, the procedure is simple: you must enter the Program by sending the proper fees (\$1.25 for FAI Stamp if you don't have one; \$2 for Juniors or \$5 for all others) to AMA HQ. The entry (not return credentials) must be postmarked by midnight of the evening before the contest. At the con-



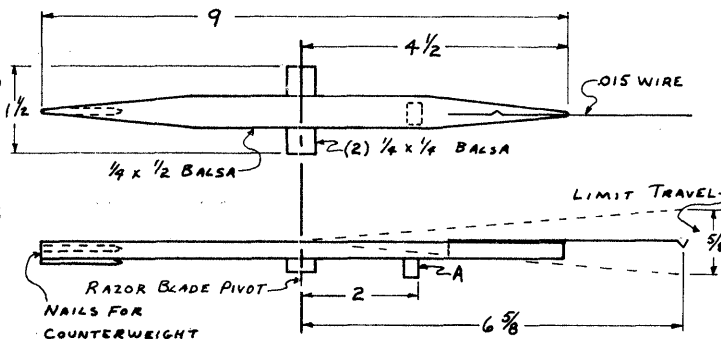
test, enter a model which weighs at least one gram and has less than 65 cm span in a regular contest event. Make the usual contest flights; if your score is at least 75% of the winning time for that event, you have qualified! Now: AMA HQ has no mechanism for sorting your flight out of the contest results, so the following steps are your responsibility:

1. Be sure that the CD checks your model for weight and wingspan limitations.
2. AMA HQ must be notified of your flight. This can be done by being sure the CD includes a separate note with his contest report, or you can get an affidavit from the CD and send it in yourself.

Several people have written me to inquire about their qualification status, citing the fact that they won such-and-such an event, without hearing from HQ. To repeat: the above mentioned documentation must be completed before AMA HQ knows that you specifically intended that flight as a qualification effort. Even though the contest is over and done, and the contest report has been filed without the documentation being made, you can still get an affidavit from the CD and clarify your status. If any questions remain, drop a note to Box 545, Richardson, Texas 75080 and state your problem.

### One Gram Balance

The sketch below shows a one gram balance designed by Bob Gibbs to process FAI models. It is perhaps the simplest and safest approach, and works well. Models are hung on the hook, and tip the balance if they are heavy enough. Bob's version used the single hook shown, but a double hook which straddles the prop shaft might be safer. Limit the amount of travel by varying the height of the block marked "A". Construct the balance from medium balsa and apply several coats of dope to waterproof it. Dimensions are not critical, but calibration is. The sensitivity of the balance is such that .0352 oz. will not tip it, but .0354 oz. will (after proper calibration). Place the balance on a smooth, level surface with "A" near the edge. This gives about 4 1/2" overhang, which seems adequate. In case the accuracy changes slightly due to humidity, stick a straight pin in one side of the beam to correct the error.



### Team Selection Trials Schedule

CALIFORNIA - Los Angeles. Local Qual. Trials, Apr. 4, 1971, Santa Ana Hangar. Bob Gibbs, 5005 Halifax Cir., Cypress, Cal. 90630, ph. 714-527-0251. All fliers intending to fly should notify Gibbs in advance due to security provisions at Santa Ana MCAF.

VIRGINIA - Hampton. Local Qual. Trials, Apr. 17-18, 1971, subject to site availability. Hal Crane, 4002 Buchanan Dr., Hampton, Va. 23669, ph. 703-723-0861.

### Qualification Trial Results

SANTA ANA LOCAL QUAL. TRIAL, Feb. 14, 1971, 155' ceiling

Eight entrants, six qualifiers			
Lew Gitlow	29:46	29:35	59:21
Clarence Mather	28:22	27:07	55:29
Paul Allen	28:13	26:50	55:03

Bud Romak	25:57	27:57	53:54
Bob Gibbs	26:48	23:29	50:17
Bob Randolph	14:01	21:30	35:31

## STATE OF THE ART

The model of the month is John Triolo's FAI, which earned him 4th in the 1969 Team Finals and 3rd at the '69 Nats, flying against larger models. John's Nats flight of 37:56.6 proved that he had found the combination of rubber and prop which he had needed the day before when his 6th round flight of 35:00 left him only 44 seconds short of a team slot. Although this late presentation was caused by lack of volunteer help at a crucial time, it can serve well as a contrast to one gram models coming up. Certainly this model showed championship potential and was one of the best. A study of the CMOS chart below and of other recent high performance models shows one thing in common - John flew his model at +5.4%, or very close to the recommended 0% balance line. Compare that with these 65 cm models: Chlubny - 0%, Andrews - 0%, Richmond - +6%, Champine - +5.5%, and Mather - -12%. Mather's comments on his model indicated that he had some problem with the -12% balance point, giving further evidence of the accuracy of a 0% setting for most models.

COW PALACE LOCAL QUAL. TRIAL, Feb. 21, 1971, 98' ceiling*			
Six entrants, five qualifiers			
Jerry Powell	12:57	14:17	27:14
Charles Baccus	13:09	12:39	25:48
Joe Bilgri	10:43	13:08	23:51
Larry Parsons	14:12	7:18	20:40
Carl Rambo	10:21	10:11	20:32

\*The Cow Palace has 98' AMA ceiling, with some space taken for girders. For this meet, large plastic sheets hung from all the girders, greatly reducing available ceiling height. In addition, conditions were poor.

## CONTEST CALENDAR

**COLORADO** - Denver area. Cat. I Indoor contests on Feb. 24 and Mar. 21, 1971. For more info contact George Batiuk 2945 S. Teller St., Aurora, Colo. 80227 or D. McGhee, 1260 Elm, Denver, Colo. 80220.

**ILLINOIS** - Chicago. Indoor sessions most Sundays through April 25, 1971, 9 am to 5 pm, at Forest View High School Gym, 2121 Goebbert Rd., Arlington Hts., Ill. Contests on Feb. 28, Mar. 28 and Apr. 25, 1971. For more info contact Pete Sotich, 3851 W. 62nd Place, Chicago, ph. RE 5-1353.

**MASSACHUSETTS** - M.I.T. Indoor sessions at M.I.T. Armory, corner of Mass. Ave. and Vassar St. in Cambridge, Mass. Feb. 20, Mar. 20, 1971 3:30 pm to 6:30 pm. Contest April 10, 1971, 1 pm to 8 pm. Contest events: Indoor Stick - JSO; Delta Dart - Jr. only, HLG - JS & O; Indoor Scale - JSO. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass.

**MASSACHUSETTS** - Amherst. Indoor flying sessions at Univ. of Mass. Student Union Ballroom; Mar. 14, Mar. 28, and Apr. 18, 1971, 10 am to 5 pm. Contact Charles Learoyd, 5 Fairfield St., Amherst, Mass. 01002, ph. 549-1150 (A.C. 413).

**MISSOURI** - St. Louis area. Indoor session Mar. 21, 1971 at Ft. Zumwalt High School, O'Fallon, Mo. Contest Mar. 28, 1971 at E. St. Louis Armory, 2931 State St., East St. Louis, 11 am to 5 pm; site opens at 9 am. Events: HLG, PennyPlane, Indoor Stick, Peanut Scale, Delta Dart. Contact Jim Bennett, 324 Helfenstein, St. Louis, Mo. 63119 ph. 962-5271 for flying schedule, event breakdown by age, and rules for PennyPlane and Peanut Scale.

**NEW JERSEY** - Lakehurst. Tentative dates for hangar #5 or #6 - May 2, June 6, July 3-4, 1971. Contact C. V. Russo, 143 Willow Way, Clark, N. J. 07066.

**NEW YORK** - Hauppauge. Indoor sessions at Hauppauge Middle School Auditorium, 6:30 pm to 10 pm, Mar. 11, Mar. 25, Apr. 1, Apr. 22, May 6, May 20, June 10, June 24, 1971. Contact Bob Sylvia, 28 Holiday Park Dr., Hauppauge, N. Y.

**NEW YORK** - Hicksville. LIAMAC Indoor meet, May 2, 1971, at Cantiague Park Skating Rink, Hicksville, L. I., N. Y. Paper Stick, Indoor Stick, Easy B, HLG, Indoor Scale. Contact J. G. Pallet, 30 Emerson Rd., Brookville, Glen Head, N. Y. 11545.

**OHIO** - Painesville. Indoor sessions each Wednesday night at Painesville National Guard Armory. Contact Dick Smola, 650 Hoyt St., Painesville, O. 44077 ph. 261-354-8260.

**OKLAHOMA** - Tulsa. Cat. II Record Trials Mar. 14, 1971. CD Bob Dunham, P. O. Box 7151, Tulsa, Okla. 74105, ph. 918-RI 3-5424.

**TENNESSEE** - Manchester. Indoor contest Mar. 21, 1971, Manchester High School Gym, Manchester, Tenn. Paper Stick, Indoor Stick, HLG, Indoor Scale and Peanut Scale. Contact Ben Cleveland, 708 County Club Dr., Tullahoma, Tenn. 37388

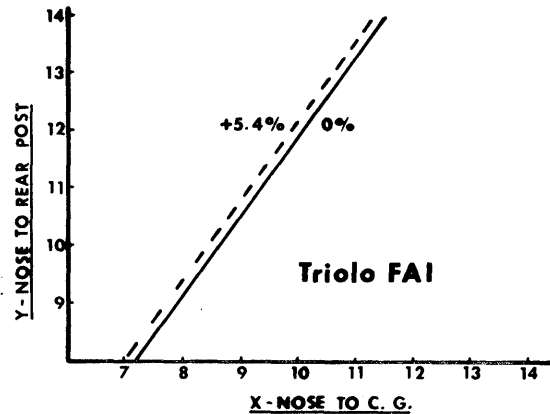
**TEXAS** - Ft. Worth/Dallas. Indoor contest Mar. 14, 1971, 3 pm to 9 pm, Arlington Rec. Center, Arlington, Tex. HLG, Indoor Stick, Easy B, AMA Cub. Bud Tenny, Box 545, Richardson, Tex. 75080 ph. 235-4035. Cat. I site.

**VIRGINIA** - Hampton. FAI Warmup session, Mar. 6-7, 1971. Willis School, Cat. I. Hal Crane, 4002 Buchanan Dr., Hampton, Va. 23369.

**VIRGINIA** - Richmond. Flying sessions two Fridays each month in small Cat. I site. Contact Fred Harlow, 9724 Royerton Dr., Richmond 23228, ph. 701-262-9112 for info on place and time.

**WASHINGTON** - Seattle area. Indoor meets Feb. 27 and Mar. 27, 1971, 6:45 pm to 9:45 pm. HLG, Indoor Scale, Easy B. Contact Bob Stalick, 1120 Shady Lane, Albany, Ore. 97321 for site info.

**WASHINGTON** - Seattle area. Easy B and Indoor HLG events held as part of the Boeing Management Association Model Aeronautics Scholarship Contest, June 19-20, 1971. Contact Herman Klegg, m/s 85-48, P. O. Box 3999, Seattle, Wash. 98124 for entry blank and details.



RECORDS? MAYBE!

Some question has been raised about recent listings showing two record applications with one flight, in view of the 1970 FFCB interpretation on a similar topic. The interpretation was "An official flight can only be recorded in one event; the event must be declared when the contestant requests an official flight." It is my personal interpretation that this ruling has no bearing on the 1969 interpretation requiring the contestant to claim either or both records in case a model and flight should meet the requirements of more than one record. At least, this was the intent of the FFCB as revealed during discussion of these issues. In effect, the 1969 ruling placed full responsibility for claiming records upon the contestant and the CD; the 1970 ruling was intended to prevent a single contest flight from applying to two events (such as A Gas and FAI Power), during the contest. That is, a contestant entered in those two events has to make a minimum of eight flights to complete both events with the same model. As stressed above, this is Bud Tenny's personal interpretation; an official differentiation would have to come from the Contest Board.

**SANTA ANA FAI LOCAL QUAL. TRIAL, Feb. 14, 1971 155'**  
Santa Ana Hangar, FAI Cat. IV, AMA Cat. III  
AMA Cat. III FAI - 29:35.0, Lew Gitlow  
FAI Cat. IV FAI - 29:46.0, Lew Gitlow

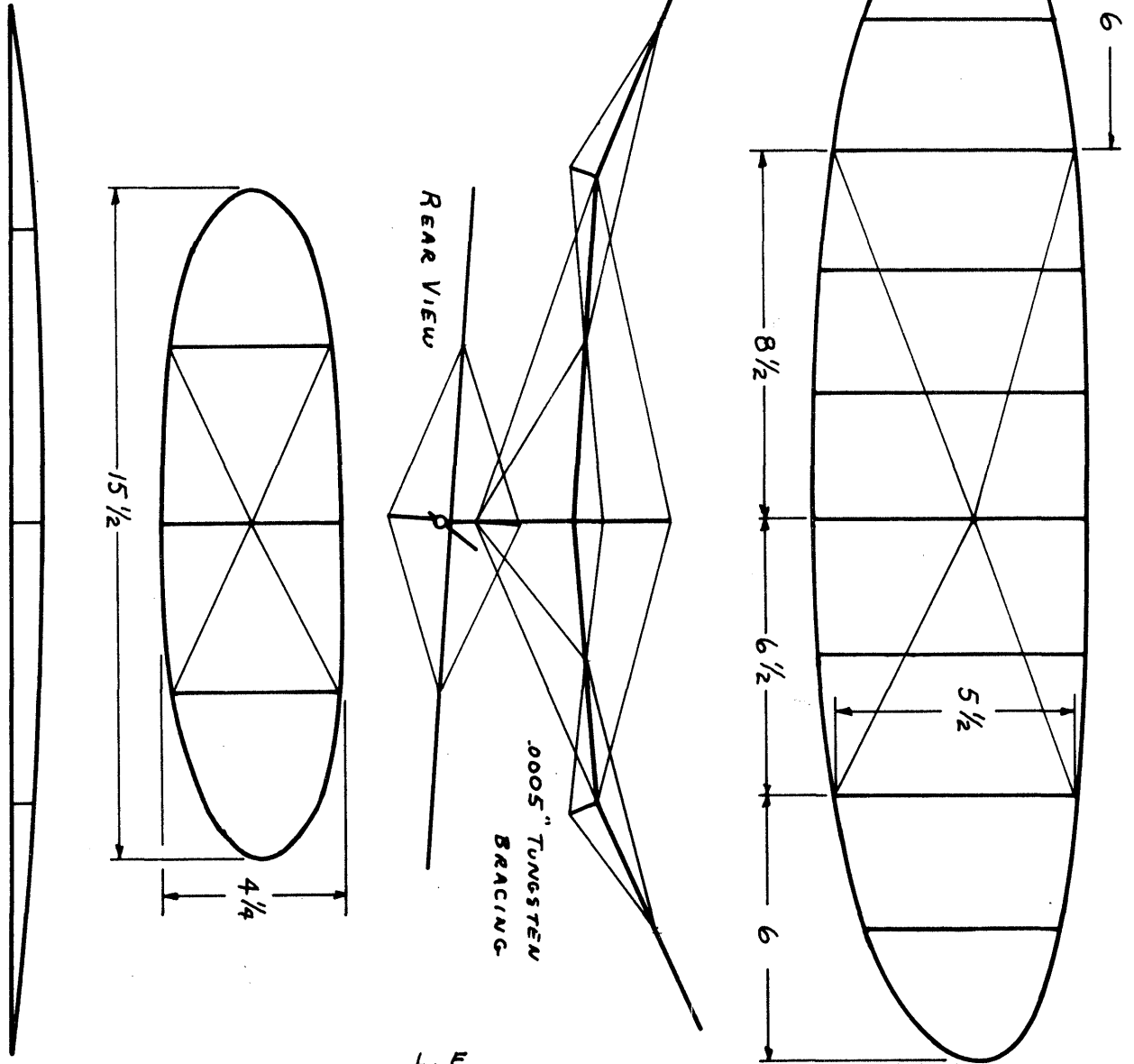
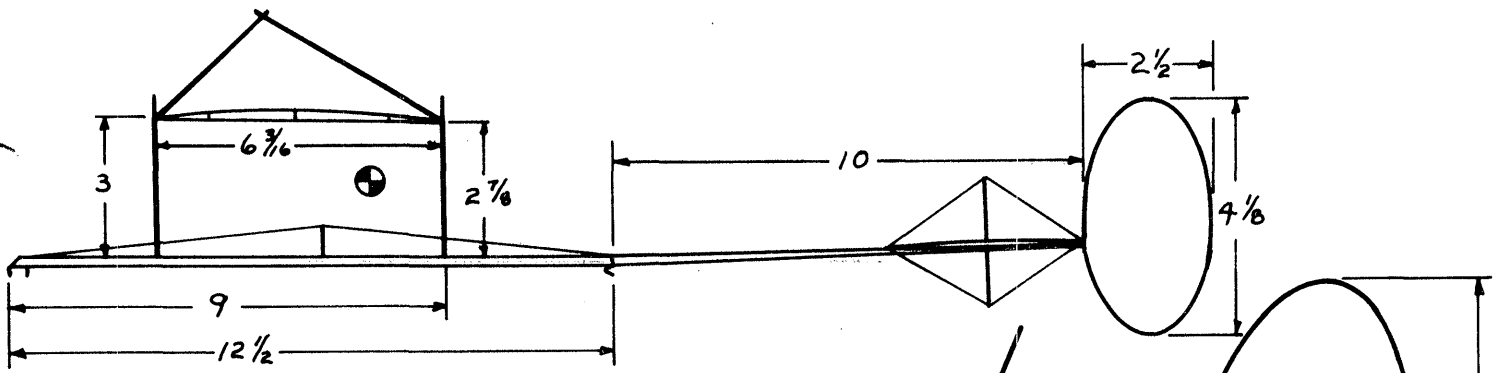
**TULSA GLUE DOBBERS RECORD TRIALS - Feb. 19, 1971, 21'**  
Senior Cat. I Cabin - 3:50, Robert Dunham II  
Senior Cat. I HLG - 0:47.5, Bobby Hanford  
Senior Cat. I Helicopter - 1:15.0, Bobby Hanford

**COW PALACE FAI LOCAL QUAL. TRIAL, Feb. 21, 1971 98'**  
Jr. Cat. II Paper Stick - 9:04.4, Gerry Geraghty  
Jr. Cat. II Indoor Stick - 7:28.3, Gerry Geraghty  
Jr. AMA Cat. II FAI - 7:04, Gerry Geraghty  
Jr. Cat. II HLG - 1:37.4, Gerry Geraghty

## RUBBER STRIPPERS

After having had opportunity to use numerous types of rubber strippers, including each type of rotary shear, the Bilgri-style stripper shown below is my favorite to use most of the time. The accuracy of most rotary units is usually superior, but these are precision machines which must be carefully "tuned" before they work properly. If they are set for the sizes you need, it is a snap to cut as much rubber as you need - otherwise, the task is formidable and not suited to flying field conditions.

The sketch below shows three views of the basic Bilgri stripper, which is constructed from plexiglas. Dimensions are not critical, but the edges of the "rubber channel" must be smooth and the joint "X" must be closed to prevent rubber from squeezing in. The balsa wedge shown in the front view was originally recommended by Bilgri, but isn't necessary in most cases.

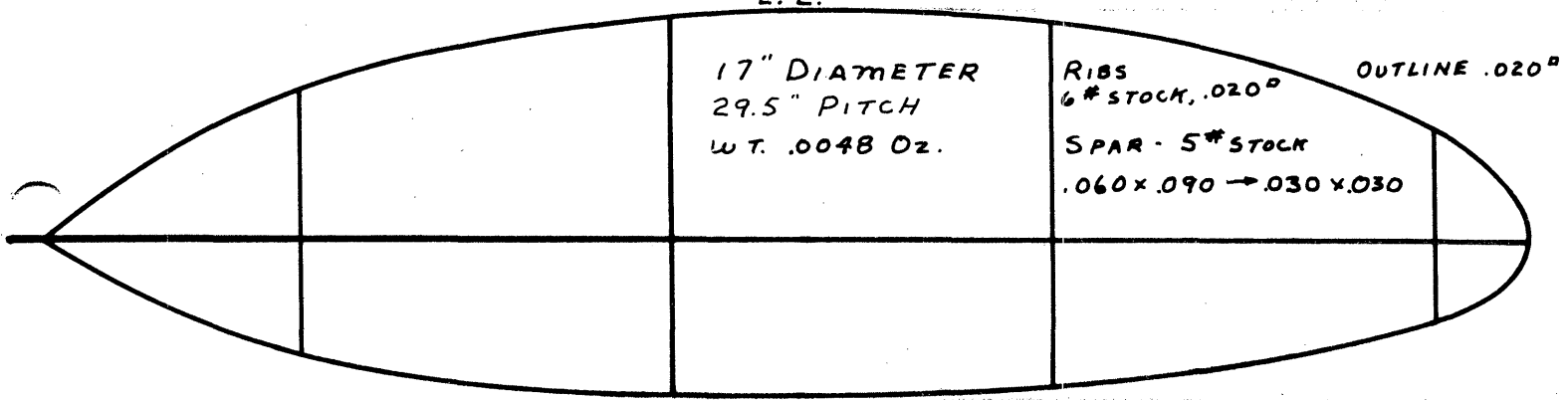


REAR VIEW

.0005" TUNGSTEN BRACING

L. E.

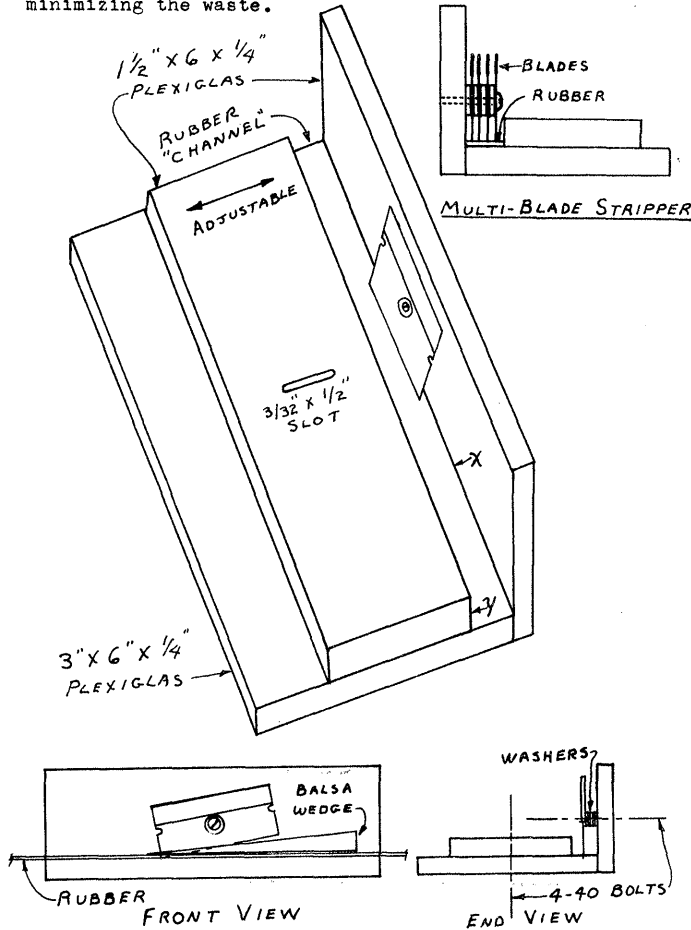
65 cm FAI by JOHN G. TRIOLO  
 RUNNER-UP 1970 TEAM 63:53  
 3RD PLACE '69 NATS 37:56.6  
 MODEL WT. .0242, RUBBER WT. .040 oz.





The stripping method consists of adjusting the width of the rubber channel to fit the rubber being cut, and setting the blade position. Press the tip of the blade into the base, through the rubber. Pull the rubber with slow, even force and move back from the stripper about eight feet. This allows tensions in the two cut strips to even out and minimize variations in width of cut. A basic limitation of this type of stripper is that cuts must be almost 50% of the width of the basic strip.

It is possible to make several cuts at one time with differing widths of cut, by using three or four blades at one time as shown by the sketch titled "multi-blade stripper". This mode of operation yields excellent uniformity from the center strips, but the two outside strips may be fairly non-uniform and have to be scrapped. So it is best to set the blades so the outer strips are narrow, thus minimizing the waste.



**THE LAB**

**Richmond Rubber Test**

Jim Richmond spent a lot of time developing and proving this rubber test, and it currently is more effective in evaluating indoor rubber than any test we have heard of to date. His test is based on a rating system, using the following formula:

$$\text{Rating} = \frac{\text{Torque at 50\% turns} \times \text{Maximum Turns}}{\text{Weight of Loop}}$$

Jim says: "In my testing of rubber, I wind to a predetermined torque - found to be the safe maximum torque for that size of rubber, and the corresponding number of turns is 'maximum turns'. I then back off turns to 50% of the maximum and take the torque reading. The back-off is done rather slowly (not at any set speed), while the distance between the hooks is maintained at 14" (or whatever it will be on the model). This method doesn't tell you anything about the shape of the torque curve, but it does provide a pretty accurate evaluation of the loop at the midpoint which can be compared with any other loop."

The effectiveness of Jim's rubber test is most likely due to its close relationship to the actual use. It has several shortcomings, which are still overshadowed by the test's accuracy. These shortcomings are:

1. "Maximum torque" is rather subjective, depending upon Jim's backlog of experience.

2. It is temperature sensitive, but all rubber tests are likely to have this characteristic until enough can be learned about the rubber to apply a correction factor.
3. The test will be slightly sensitive to rate of unwinding, unless torque is allowed to stabilize at full winds and 50% winds.
4. The test takes a lot of time. Jim winds a motor once, and computes the rating. If this rating is high, he winds it twice more and accepts the rating from the third windup. (The rating increases with each wind, since "maximum turns" increases with each use - see Feb. '71 INAV.)

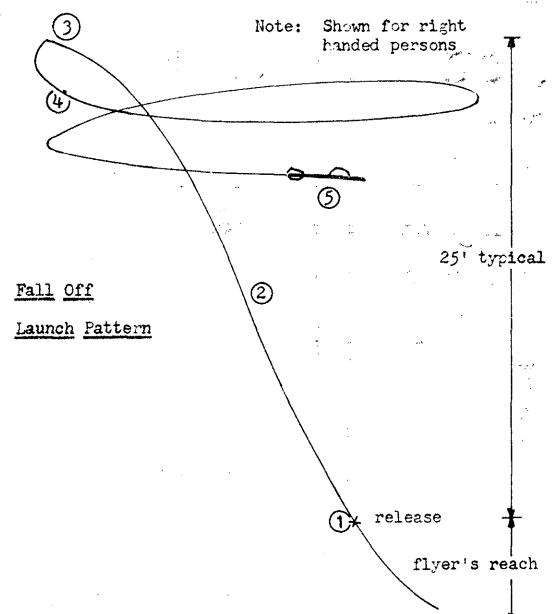
**LOW CEILING FORUM**

**Fall Off Launch Pattern**

by Frank Perkins

The "fall off" launch pattern is quite successful for low and moderate ceiling indoor HLG. I've been working on this pattern recently, (with a good deal of coaching and advice from Don Chancey and Dick Mathis) and I've finally gotten a little feel for what is going on. Here is a short discussion of this launch pattern (refer also to the sketch and accompanying comments):

For low ceiling HLG the "fall off" pattern has two advantages over the "s" pattern: the glider is subject to less stress in the launch, and it is easier to thread this pattern through obstructions near the ceiling of typical indoor sites. The glider is set up with a touch of left rudder and a fair amount of washin in the left wing tip. The glide circle is fine tuned with stab tilt after the launch is adjusted. If the model slides back on its tail repeatedly, move the CG forward or bank the launch more to the left. Note: these comments are for left-left pattern.



**Fall Off Launch Pattern**

- (1) Glider is launched at about 70° angle, with slight left bank. The right arm extends upward and slightly to the left as model is released. Complete extension of arm and smooth follow through important. The glider is thrown somewhat like a dart in that it must point in the direction of flight all through the launch.
- (2) Glider climbs away with wings still banked a bit to the left. Nose pitches up slightly. Glider is drifting slightly to the left.
- (3) At apex of launch glider enters mild turning stall. Glider falls into left wing, yawing rapidly left about 90°.
- (4) The left wing recovers, and the left wing tip and nose "pop" up into glide attitude.
- (5) Glider descends to floor in smooth left circles.

**LAST MINUTE BULLETIN**

The Santa Ana Record Trials of Mar. 7, 1971 yielded two new 65 cm marks which have been submitted as records. Bud Romak's last flight had to be steered, but clocked 33:42; he applied for the FAI Cat. IV FAI mark. Clarence Mather's biplane turned in 32:43 toward the AMA Cat. III FAI record.

# INDOOR

## NEWS and VIEWS Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

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

### New Members!

R. L. ANDERSON, JR., 2020 Winchester Rd., Toledo, O. 43613  
 CHARLES V. DUNCAN III, 7303 Hirsch Dr. SE, Albuquerque,  
 N. Mex. 87116  
 GILBERT G. GRAUNKE, 15260 W. Heather Hill Dr., Brookfield,  
 Wis. 53005  
 ROBERT E. HENDRICKS, 4644 Joanna Ct., Fremont, Cal. 94536  
 OSCAR KUMMER, 26 Lakeridge Dr., Matawan, N. J. 07747  
 CHARLES H. LEAROYD, 119 Washington St., Marblehead,  
 Mass. 01945  
 KENNETH H. MARK, 45 Evelyn Ave., Toronto, Ontario, Canada  
 ROBERT A. O'NEIL, 20 Forest Rd., Welland, Ontario, Canada  
 WILLIAM H. WEAVER, P. O. Box 1387, Frederick, Md. 21701

### NIMAS Postal Meet

The 6th Annual NIMAS Postal Meet was supposed to have been announced in the March issue! Because of the late announcement, flights made between March 1 and May 17 will be eligible for entry in the Postal. That will allow any March flights made in anticipation of the Postal to count. Therefore, the entries to the 1971 NIMAS Postal meet must be postmarked not later than May 17, 1971.

**Events:** Easy B, paper covered only, solid motor stick and boom, with unbraced surfaces.

HLG - AMA Rules except two ceiling classes -  
 Class I - 18' to 25'; Class II - 25' to 35'

Indoor Stick - AMA Rules except FAI ceiling  
 measure to compute fudge factor.

**General Rules:** Entry fee 15¢ per event, stamps preferred. Separate events may be flown at different sessions, but all flights for a given event must be flown at one session. Please note ceiling height for each entry, as it will be used to compute fudge factors to equalize ceiling heights. Separate class for Juniors in each event, with awards for high placing Seniors. Separate class for Sub-Junior (age 12 and under) in HLG. Anyone can enter; send entries to NIMAS, Box 545, Richardson, Texas 75080.

**Special events:** PennyPlane and Ceiling Dodger will be held if five entries are made in these events. Use any model for Ceiling Dodger; count highest time attained on flights which do not touch ceiling. Use Chicago Aeronuts PennyPlane rules.

### The Indoor Nats

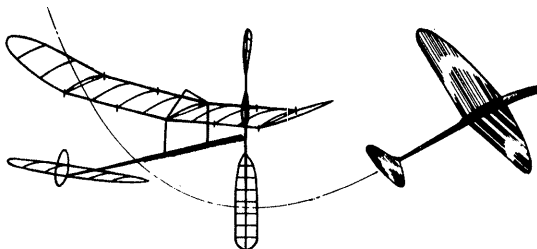
According to a memo from Pete Sotich, IHLG and Indoor Scale will be held on July 26, 1971, and the regular Indoor Rubber events on July 27. Some mention has been made of flying Indoor Scale (regular event) and Peanut and Navy Scale ("extra" events) at some site other than where IHLG and Rubber are flown. Whatever the outcome of that point, two sites are presently under consideration for the Rubber and HLG events: International Amphitheatre (1966 Nats site) and the Brig. Gen. Richard L. Jones Armory (formerly the Washington Park Armory and site of the 1970 Nats). It seems that either may be available, and the decision will be announced as soon as possible. PennyPlane will also be sponsored again by the Chicago Aeronuts, and will be flown at a site and time to be announced.

### NIMAS Aces

Fred Harlow posted a Cat. I flight of 17:03 at the March 6 Willis School session. This qualifies him for the Diamond Cat. I Rubber Award; with his previous flights of 11:04 and 12:56 it qualifies him for NIMAS Ace. Fred is the thirteenth NIMAS member to become Ace in a rubber class, and has made large strides in his personal "state of the art" in just over 12 months!

### Clubs?

Robert O'Neil, Welland, Canada (see New Members!) is interested in contacting indoor fliers and clubs in his general area (Hamilton and Toronto in Canada and Buffalo and Niagara Falls, New York).



### Contacts Wanted

Jim Miller, 827 Yorkhaven Rd., Cincinnati, O. 45240, is beginning modeling classes for youngsters. He would welcome correspondence from others holding similar classes and hopes eventually to schedule postal meets.

### Postal Challengers

Fred Harlow, 9724 Royerton Dr., Richmond, Va. 23228, is looking for postal competition in Easy B. He has a small Cat. I site which he uses regularly.

### New Publications

On page 120 of the April '71 Esquire is an article called "Flip, Flop The Ornithopt". It features Ken Johnson's ornithopter along with some excellent action and color photography and interesting patter. Mention was made of INAV, which yielded many inquiries. In fact, if you're expecting a letter from here, it has been delayed by responses to those inquiries!

### FAI INDOOR REPORT

#### Team Selection Trials Schedule

**CALIFORNIA** - Los Angeles. Local Qual. Trials, April 11, 1971 (changed from Apr. 4), Santa Ana Hangar. Bob Gibbs, 5005 Halifax Cir., Cypress, Cal. 90630, ph. 714-527-0251. All fliers intending to fly should notify Gibbs in advance due to security provisions at Santa Ana MCAF.

**ILLINOIS** - Chicago. Local Qual. Trials, May 2, 1971 at Elk Grove Jr. High, Ridge Ave. & Elk Grove Blvd., Elk Grove Village, Ill. 12 noon to 5 pm, 25' ceiling. Pete Sotich, 3851 West 62nd Place, Chicago 60629, ph. 312-RE 5-1353.

**OHIO** - Akron. Local Qual. Trials, April 18, 1971, 9am to 5 pm, Wingfoot Hangar. Participants must notify Bill Hulbert in advance due to security problems. Contact Bill at 174 Castle Blvd, Akron, O. ph. 216-864-8030.

**OKLAHOMA** - Tulsa. Local Qual. Trials, April 17, 1971, at Reed Park Gym in Tulsa; 1 pm to 4 pm. Bob Dunham, Box 7151, Tulsa, Okla. 74105 ph. 918-747-0720.

**NEW JERSEY** - Lakehurst. Local Qual. Trials Apr. 25, 1971 at Hangar #5. C. V. Russo, 143 Willow Way, Clark, New Jersey 07066.

**TEXAS** - Dallas/Ft. Worth. Any flier in this area who wishes to qualify should enter the Program via AMA HQ immediately and also notify Bud Tenny by Apr. 20, 1971 so proper planning can be done. Another AMA contest will be held to give prospective qualifiers a chance to fly. Bud Tenny, Box 545, Richardson, Tex. 75080, ph. 214-235-4035.

**WASHINGTON D. C./BALTIMORE AREA.** Local Qual. Trial, April 24, 1971, at South Post Gym, Ft. Myer, Va., 8:30 am to 12 noon, 36' ceiling. Tom Vallee, 444 Henryton So., Laurel, Md. 20810

### Qualifiers Via Contests

	Time	Top Time	%
George Batiuk	8:56	10:01	89
Hal Blubaugh	12:29	15:27	81
Bob Champagne	18:28	18:28	100
Jim Clem	5:14.5	6:27	82
Ted Gonzoph	7:17	7:17	100
Ed Collins	8:32	10:01	85
Kristi Tenny	8:16.4	8:16.4	100
Paul Tryon	7:10.8	7:10.8	100

### CONTEST CALENDAR

**ILLINOIS** - Chicago. Indoor contest April 25, 1971 at Forest View High School Gym, 2121 Goebbert Rd., Arlington Hts., Ill. HLG, Indoor Scale, Gone Goose. Pete Sotich, 3851 W. 62nd Place, Chicago, Ill. 60629 ph. 312-RE 5-1353.

MARYLAND - Silver Spring. Indoor sessions at JFK High School, 1901 Randolph Rd., Silver Spring, April 23, May 7, May 14, May 21, May 28, 1971. Tom Vallee, 444 Henryton So., Laurel, Md. 20810.

MASSACHUSETTS - M.I.T. Indoor contest at M.I.T. Armory, corner of Mass. Ave. and Vassar St. in Cambridge, Mass. April 10, 1971, 1 pm to 8 pm. Indoor Stick, Delta Dart, HLG, Indoor Scale. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass.

MASSACHUSETTS - Amherst. Indoor Session at Univ. of Mass. Student Union Ballroom, Apr. 18, 1971, 10 am to 5 pm. Contact Charles Learoyd, 5 Fairfield St., Amherst, Mass. 01002, ph. 413-549-1150.

NEW JERSEY - Lakehurst. Confirmed dates for Hangar #5 at Lakehurst NAS - Apr. 25, May 16, June 13, July 3-4, 1971. C. V. Russo, 143 Willow Way, Clark, N. J. 07066.

NEW YORK - Hauppauge. Indoor sessions at Hauppauge Middle School Auditorium, 6:30 pm to 10 pm, Apr. 22, May 6, May 20, June 10, June 24, 1971. Bob Sylvia, 28 Holiday Park Dr., Hauppauge, N. Y.

NEW YORK - Hicksville. LIAMAC Indoor meet, May 2, 1971, at Cantiague Park Skating Rink, Hicksville, L. I., N. Y. Paper Stick, Indoor Stick, Easy B, HLG, Indoor Scale. Contact J. G. Pallet, 30 Emerson Rd., Brookville, Glen Head, N. Y. 11545.

OHIO - Painesville. Indoor sessions each Wednesday night at Painesville National Guard Armory. Contact Dick Smola, 650 Hoyt St., Painesville, O. 44077 ph. 261-354-8260.

TEXAS - Dallas/Ft. Worth. Possible contest middle or late April, Cat. II site. Contact Bud Tenny, Box 545, Richardson, Texas 75080 ph. 214-235-4035 for place and time.

VIRGINIA - Richmond. Flying sessions two Fridays each month in small Cat. I site. Contact Fred Harlow, 9724 Royerton Dr., Richmond, 23228, ph. 701-262-9112 for info on place and time.

WASHINGTON - Seattle area. Easy B and Indoor HLG events held as part of the Boeing Management Association Model Aeronautics Scholarship Contest, June 19-20, 1971. Contact Herman Klegg, m/s 85-48, P. O. Box 3999, Seattle, Wash. 98124 for entry blank and details.

#### HINTS AND KINKS

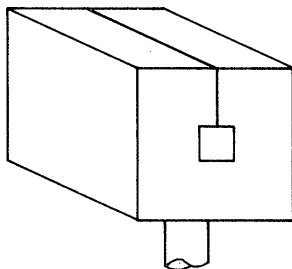
##### Paper Covering Hint

Bob Randolph is now covering paper ships by coating the framework with rubber cement and allowing it to dry. Then the paper is attached by placing it in place against the frame and moistening the area with thinner. This way, the covering can be done slowly enough to work out the wrinkles as you go.

In addition, Bob's paper ship stabs have been covered on the bottom side of the rib. Whether or not this has any aerodynamic advantage, the stabs tend to stay flat for longer periods of time.

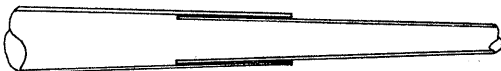
##### Rundown Stand

The sketch below shows Richard Hardcastle's rundown stand. It is constructed simply by cutting the form out of foam rubber and then cutting a slit and inner channel.



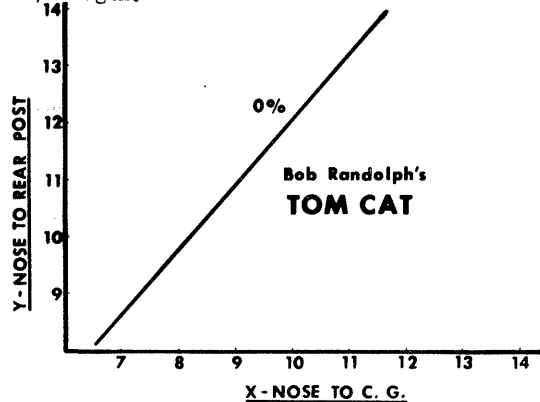
Adjustable Tail Tilt

Tom Sova has a neat way to adjust model circle diameter; the tail boom is two-piece. The rear portion slips over the front stub about 3/4", and holds by friction. The fin is glued on at enough of an angle to give a 25' circle, and alignment marks are made on the two halves of the boom. At the site, it is easy to twist the boom to a new angle of tilt for the proper turn.



#### STATE OF THE ART

Bob Randolph's TOM CAT was the high time model at the first 1971 Santa Ana session on Jan. 24, 1971. The time of 27:31 was set in cold weather from catwalk height, so the design has more potential. More important, the model should be an excellent transitional design for those who may not want to go all the way to 7 1/2" or 8" chord (see Dec. '70 INAV) models for the new one gram rules. The original TOM CAT was completely destroyed at the next meet and Mk II has the following changes: 13 1/2" stick, 13" tail boom, 17 x 35 reverse flare prop, 4" x 15" elliptical stab and compression ribs at all stations. Bob didn't give any balance data, but as usual the CMOS chart below is computed for 0% margin.



#### RECORDS? MAYBE!

D. C. MAXECUTORS RECORD TRIALS, Mar. 27, 1971 36' ceiling  
Open Cat. II Helicopter - 7:31.8, Tom Vallee

LIAMAC RECORD TRIALS, March 26, 1971, 33' ceiling  
Junior Cat. I HLG - 0:45.0, Bruce Pallet  
Junior Cat. I Paper Stick, 5:56.6, Barry Pallet

TULSA GLUE DOBBERS RECORD TRIALS, 37' ceiling  
Senior Cat. II Indoor Stick - 11:06, Robert Dunham II  
Senior AMA Cat. II FAI - 11:06, Robert Dunham II  
FAI Cat. II FAI - 11:06, Robert Dunham II

#### CONTEST RESULTS

CHICAGO AERONUTS INDOOR CONTEST, Feb. 28, 1971

Class A IHLG - Junior 4 entries		Open (7 entries)	
1. Keith Gordey	40.5	1. Charlie Sotich	56.9
2. Mark Kummerow	34.8	2. Chuck Markos	52.6
3. Scott Wisniewski	34.2	3. Mark Heller	51.3
4. Tim Stone	31.2	4. Sam Winters	45.6
		5. G. Wisniewski	45.1

Junior PennyPlane 10 entries		Open PennyPlane 15 entries	
1. Scott Wisniewski	4:24.8	1. Charlie Sotich	4:11.0
2. Tim Noonan	4:00.3	2. Chuck Markos	3:53.5
3. Mark Kummerow	3:01.6	3. Ken Kraemer	3:28.4
4. Jeff Wickland	2:52.6	4. Dave Linstrum	3:25.4
5. Fritz Curth	2:16.0	5. John Rossi	3:13.0

#### NEWS FROM AROUND THE WORLD

##### ARGENTINA

The 1971 Argentina Nats was held at Parana, quite a distance from Buenos Aires where most of the indoor fliers live. As a result, attendance was poor at the indoor Nats and the site was also small. The results:

Nereo Beggiatto	776	708	1474
Luis M. Coronel	600	768	1369
Julio H. Ferreyra	311	483	794
Mrs. Coronel	336	279	615

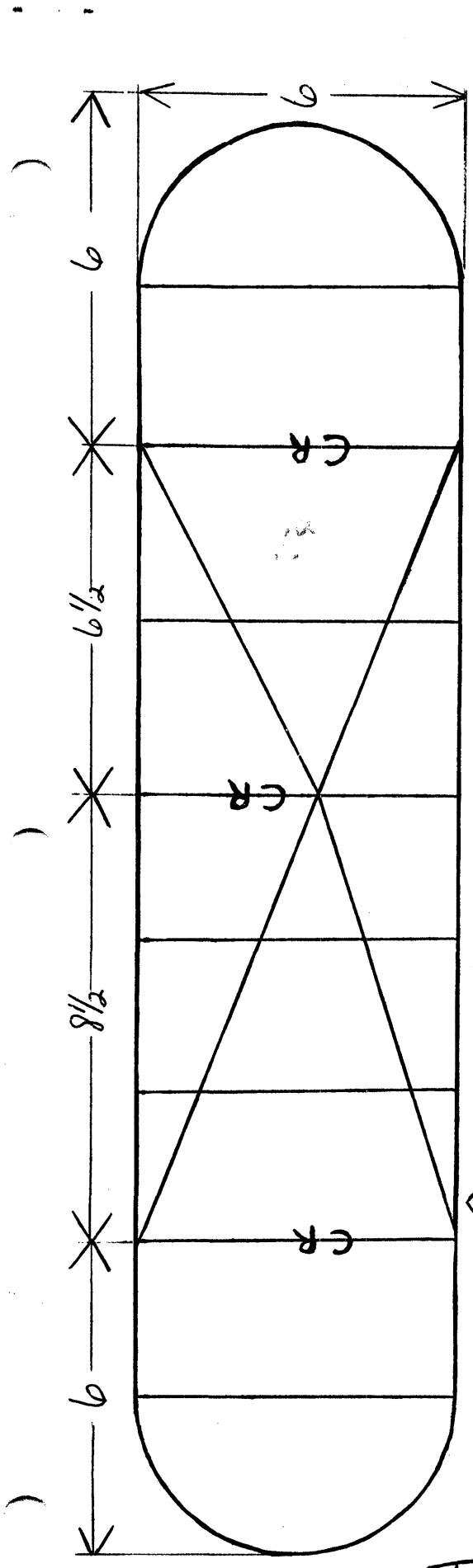
The Argentine aero club has permission to send an indoor flier to the next South American Championship to help introduce indoor flying. Nereo Beggiatto was chosen to make the trip; his excellent models should make a good impression!

##### CZECHOSLOVAKIA

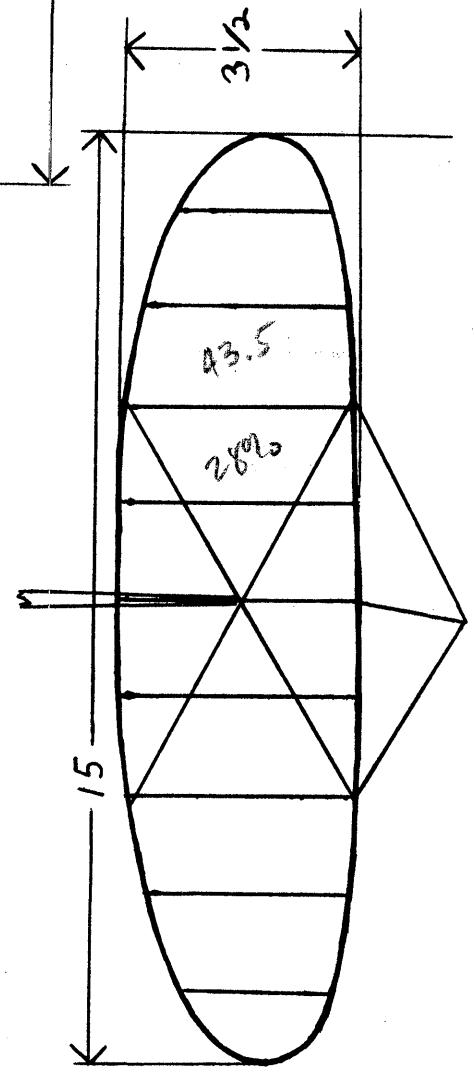
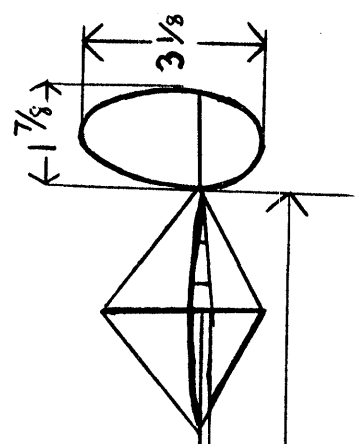
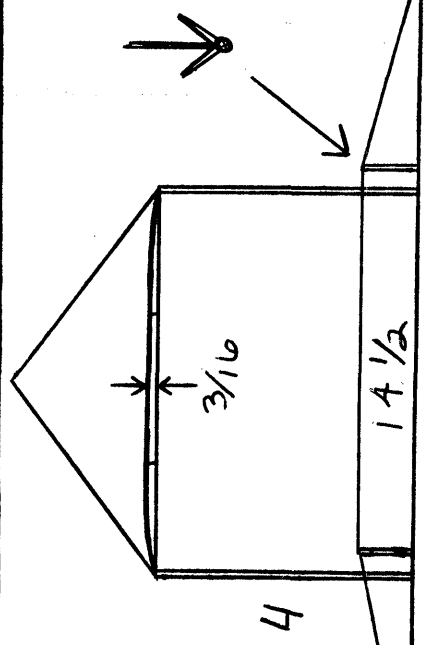
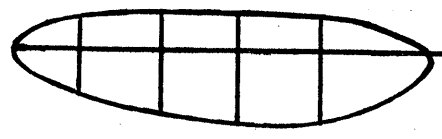
The Czech team selection will be accomplished from the results of three meets scheduled in June, July and October, all flown in the Z Hall in Brno. These three meets are the first Czech meets this year, but many fliers plan to try out their one gram models at Slanic (salt mine) May 7-9.

##### ENGLAND

English fliers gave strong support to a series of indoor sessions at the RAF Brize Norton hangar, which gave impetus to the movement which got under way at Cardington sessions last fall. Now there are 12 1971 Cardington sessions planned, beginning with April 18, 1971. Center for all this activity is Laurie Barr, 4 Hastings Close, Bray, Berkshire. Besides organizing the activity, Laurie has stocked indoor supplies as a service to local fliers.



1/4" Wing WASH  
 3" DIH  
 WT. .036 oz.



**Tom Cat**

RECORD FAI  
 27:31 SANTA ANA  
 24 JAN 1971

Bob Randolph

## ADJUSTING INDOOR RUBBER POWERED MODELS

by Charlie Sotich

(Ed. Note: This has been reprinted from the Feb. '62 IMAC News, edited for years by Pete Sotich.)

The real trick in getting the most time out of an indoor model is finding the best combination of propeller and rubber motor. The only way to find this combination is through a lot of test flying. If you intend to do any contest flying, don't wait until the day of the contest to try out a new model. It will probably be too late then! You can have the lightest and best model at the meet, but if you don't have the right prop and rubber to match it, the model can't give its best performance.

The basic steps to adjusting the flight trim are:

1. Locate the CG in the correct position relative to the wing with the motor in place. (Adding weight to the nose of the model may be necessary.)
2. Set the wing incidence (it should be adjustable).
3. Set the fin for left turn (build it into the model).
4. Have wash-in in the left wing (build it in).
5. Make a test flight with the motor wound to about 1/2 of maximum turns to check wing incidence and fin settings.

After you launch the model, walk slowly behind it on the inside of its circle. By staying close to the model you will be in position to catch it if it should start to dive or stall. Observe the model as you follow it to see what adjustments are necessary to improve it. Reduce the wing incidence if it stalls, give it more left rudder if the turn is too wide, etc.

Some models may seem very sensitive to a slight change in wing incidence. (A very slight increase causes the plane to stall, while a slight decrease results in a dive). Add some weight to the nose to move the CG forward; when you build the next model keep the tail lighter or mount the wing farther back.

As you make successive flights, keep increasing the number of turns by 100 or 200 each flight. The best flights are usually made when the model climbs to the maximum possible altitude and has only about 10% of the turns left at landing.

- If the model will not climb high enough and
- (a) has many turns left - shorten the motor and/or use a larger size rubber.
  - (b) has very few turns left - lengthen the motor and use a larger size rubber.

- If the model climbs to the ceiling and
- (a) has many turns left - shorten the motor and use a smaller size rubber.
  - (b) has very few turns left - lengthen the motor or use a smaller size motor.

The rate of climb and the altitude reached can be controlled to some extent by the winding procedure. By unwinding some turns (50 to 100) when you finish winding, you can eliminate some of the power burst at the start of the flight. Since the initial torque of the motor is several times greater than the cruising torque, backing off turns will cut down the altitude gained and reduce the stress on the model at the start of the flight. Using this procedure allows you to fly on larger rubber than necessary if the correct size is not available.

The size of a model's flight circle depends upon these factors:

1. The size of the building and available floor space.
2. Drift due to air currents.
3. The shape of the building near the ceiling and the location of obstructions such as lights, girders, etc.

From a performance standpoint, a model probably loses some efficiency as the flight circle is reduced. With the smaller circle, however, it is less likely to be seriously affected by changes in flight direction after hitting an obstruction or stalling, etc. Obviously a model flying in the largest possible circle will be in trouble if any change in flight path occurs. A model with a small circle can safely wander over a larger area than one with a large circle. A small circle will usually increase possible flight time in drafty buildings before the model hits an obstruction. During test flying, observe drift patterns so you can launch from the best location, and always check to see if drift is the same at all levels and at all locations on the floor.

Some models tend to lose their normal left turn under full turns, and fly straight ahead. This is caused by

insufficient rudder area to counteract the torque. (Ed. note: high torque can also twist the motor stick so the stab tilt is minimized or reversed - causing loss of turn until the burst dies down.) If the rudder is replaced by a larger one, the model will tend to hold its turn during the initial phase of the climb.

Newcomers to indoor often have difficulty getting their models to climb. This usually can be overcome by changing the prop design. Most articles on indoor models cover very light models, and the props shown are unsuitable for heavier models constructed from the plans by the average beginner. These heavier models must fly faster to stay airborne, and thus require larger rubber and smaller diameter, lower pitch props. It is a good idea to have extra props of various sizes and compare the model's performance with each to determine the best prop size. It may seem strange to consider a faster prop for an indoor model, but the duration can increase due to these factors:

1. With a faster prop, the model should climb higher.
2. Many of the turns formerly left in the motor will be used up descending from the higher altitude.
3. A longer motor may then be used to further increase the potential duration.

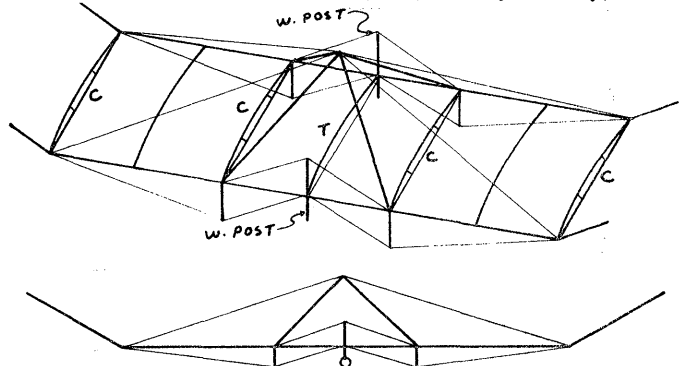
### DESIGN FOOTNOTES

This column is set aside to report on design philosophy, proven or speculative, and ways to implement these ideas. This offering is speculative, intended to spark curiosity about possible aerodynamic innovations in one gram model design.

A considerable amount of flight testing by Stan Chilton and myself has apparently demonstrated improved cruise performance with models having between 6% and 8% airfoil thickness. As is well known to blimp hangar fliers, these same models are difficult to use for high ceiling flying. Considerable thought has yielded a possible explanation in addition to the obvious one of excess drag. Indoor models have a high wing location which moves the center of drag well above the thrust line. This causes a nose-up moment which reinforces the normal zoom associated with increased thrust and velocity during the power burst, and is common to all indoor models. By trial and error the high ceiling fliers have adopted thin airfoils to speed up the climb, possibly to the detriment of the cruise.

Another possible result of the nose-up moment is distortion of the wing structure, ribs and covering which increases the wing camber, along with effective lift and drag. Thin airfoils can distort somewhat without large increases in drag, but thicker airfoils obviously have more than their share of increased drag. If the nose-up moment can be eliminated or minimized, is it possible that thicker wings would climb fast enough to permit their use in high ceilings? If so, the improved cruise, which is proportionately a larger part of the flight than for low ceiling flights, should boost flight times considerably.

Since the high wing location is the theoretical culprit, put it next to the motor stick! This may be done by several methods, but Max Chernoff designed a special wing bracing system which is shown below. The wing posts are shortened to lower the wing to within an inch or less of the motor stick, and the cabane becomes four-legged to pass the wing loads to the first rib location outboard of the wing center. Short vertical posts below the ends of the cabane furnish leverage against uploads on the wing; these loads are normally carried by the wing posts. Tip bracing has been omitted in the sketch, but would remain similar to present practice. As usual, compression ribs are needed at the dihedral breaks, and the center rib can be a tension rib. In addition, the ribs at the bottom of the cabane must be compression ribs (compression and tension ribs are marked with "c" and "t" respectively).



# INDOOR

## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

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

### New Members!

JEFFREY ANNIS, 5689 W. Betty Lane, Brown Deer, Wis. 53223  
LARRY DE CARLO, 842 Lincoln Ave., Baldwin, L. I., N. Y.

11510

BRUCE CLARK, 813 S. Washington, St., Medina, O. 44256  
LARRY HERRICK, 849 Hardesty Blvd., Akron, O. 44230  
ARTHUR J. HOLTZMAN, 321 June Place, W. Hempstead, N. Y.

11552

I. J. WRIGHT, 63 Molimo Dr., San Francisco, Cal. 94127  
ROBERT J. ZAHRADNIK, P. O. Box 161, Mars, Pa. 16046

### Honorary Members

KEITH W. BULLOCK, 33 Belmont St., Rainbow Hill,  
Worcester WR38NN, England  
IAN KAYNES, 11 Parkside Rd., Summingdale, Ascot, Berks,  
England

### Change of Address

Maj. Gen. Franklin Davis, U. S. Army War College,  
Carlisle Barracks, Pa. 17013  
Erwin Rodemsky, 1624 St. David Dr., Danville, Cal. 94526

### Sponsored Junior Memberships

WALTER LOUNSBURG, 715 Russell Rd., Kansas City, Mo. 64116  
KEVIN WEHNER, 712 Russell Rd., Kansas City, Mo. 64116

Walter and Kevin were nominated by Roger Schroeder, after he had worked and counselled with them during his work on the Special Action Committee. The boys are close neighbors, and work together most enthusiastically.

They began modeling during the summer of 1970, flying gas models. They later were able to gain access to a gym and started indoor flying with Sleek Streaks. After their school opened, they sponsored some Delta Dart activity in their science club. With this background, they began to fly indoor in earnest with coaching from Roger.

### NIMAS Aces

Ned Smith's flights in the Hampton Local Qual., 14:29 and 15:02, moved him into the Ace ranks. Ned had little chance to fly seriously while at school, but his performance has climbed steadily since he moved to Hampton and has access to a good site. Congratulations, Ned!

### '71 Nats

The following information appeared in the Mid-April Competition News:

### Indoor Events

The International Amphitheatre (4300 S. Halstead St., Chicago) has been approved as the site for Indoor Events of the 1971 Nats -- Monday and Tuesday as per the schedule published in the March CN. The facility is a Cat. II site, 87' ceiling. The floor area is 283' x 123'.

Special arrangements have been made to permit advance entrants (those who postmarked Nats entry forms to AMA HQ no later than June 21) to register and have certain problems taken care of at the International Amphitheatre, as follows. Late entries may only be made at Glenview NAS and on Monday only.

### Monday, July 26, 9am to noon

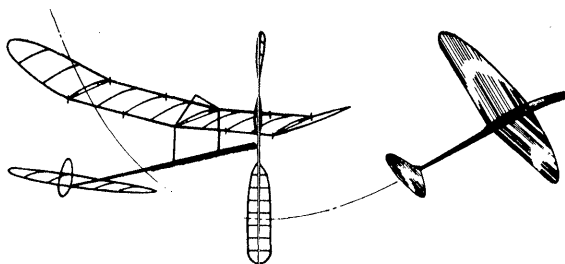
a. Nats Registration (officially check in, obtain Nats identification and contestant information kit). This is necessary before any official flying takes place.

b. Housing Priority. For those who have such priority, it may be claimed.

c. Navy Meals. Tickets for same may be purchased.

d. Add Events. These may be entered and paid for.

e. Entry Discrepancies. Any money or entry form problems, indicated by "report to desk P" notation on entry form.



### Tuesday, July 27, 9 am to noon

a. Nats Registration only, as "a" above. No housing, meals or event additions can be taken care of at the Indoor site on Tuesday.

b. Event discrepancies, as "e" above.

### Nats Event Schedule

Monday, July 26 - Indoor HLG, Indoor Scale, PennyPlane.

Schedule for presenting scale models will be published as soon as it is known; it will be early due to the need for proper judging.

Tuesday, July 27 - All indoor rubber events.

Note: Nats Entry Blanks are available from AMA HQ; send a stamped, self-addressed envelope with your request.

### FAI INDOOR REPORT

#### Entry Deadline

The deadline for entry into the FAI Team Selection Program now in progress is May 15, 1971. Entry may be accomplished by entering at a Local Qualification Trials, or by sending the appropriate fee (\$2 for Juniors, \$5 for all others) to AMA HQ. In the latter case, the entry must be postmarked before May 15, 1971.

If you want to enter the program and have not entered by the time you receive this newsletter, you should do so even if you plan to enter (for example) the Detroit Local Qual. Trials, which is scheduled for May 9, 1971. If, for some unavoidable reason, the site is unavailable on that date, those who were entered by the deadline will still be in the program. Enter now if you're gonna!

#### Resignation From Program

By now we have a substantial number of qualifiers in the Team Selection Program. Those who have qualified have the obligation to appear in the Semi-Final of their choice or to formally resign from the Program. This resignation then enables the first runner-up from the same Qual. Trial to advance to the Semi-Finals. Resignation can be done by making this declaration to AMA HQ, or to Bud Tenny, Box 545, Richardson, Tex. 75080. If possible, the runner-up should also be notified as soon as you make the decision. In all fairness to the runner-up, please do not delay once you determine you will not be able to continue in the Program!

#### Team Selection Trials Schedule

MICHIGAN - Detroit. Local Qual. Trials, May 9, 1971, at Michigan State Fair Coliseum. Paul Crowley, 32604 Tecla, Warren, Mich. 48093 ph. 313-294-0266.

TEXAS - Dallas/Ft. Worth. Indoor contest Cat. II site, May 9, 1971. Qualify via contest; entry must be made (postmark) not later than May 8. Bud Tenny, Box 545, Richardson, Texas 75080 ph. 214-235-4035.

NEW JERSEY - Lakehurst. Eastern Semi-Final, Lakehurst NAS June 13, 1971. C. V. Russo, 143 Willow Way, Clark, New Jersey 07066.

#### Qualification Trial Results

SANTA ANA LOCAL QUAL. TRIAL, Apr. 11, 1971, 155' ceiling

Entrant	Time	Time	Time
Four entrants, three qualifiers			
Larry Cailliau	26:07	27:18	53:25
Linda Randolph	24:54	24:40	49:34
Warren Williams	19:49	21:22	41:11

CEDAR KNOLLS SCHOOL LOCAL QUAL., Apr. 14, 1971

Entrant	Time	Time	Time
Six entrants, five qualifiers			
C. V. Russo	4:57	4:41	9:38
Sal Canizzo	4:53	3:52	8:45
Ed Franklin	3:53	4:08	8:01
John Triolo	3:44	4:07	7:51
Don Garofalov	3:40	3:22	7:01

TULSA, OKLAHOMA LOCAL QUAL. TRIALS, Apr. 17, 1971

Entrant	Time	Time	Time
Four entrants, four qualifiers			
R. J. Dunham	9:37	10:16	19:53

John English	9:43	9:56	19:39
Robert Dunham II	7:41	7:46	15:27
Dick Ganslen	7:34	7:41	15:15

HAMPTON, VA. LOCAL QUAL. TRIALS, Apr. 18, 1971, 20' cell.

Six entrants, five qualifiers			
Bob Platt	18:24	18:15	36:39
Hal Crane	16:35	18:30	35:05
Fred Harlow	16:23	17:30	33:53
Tom Vallee	15:21	16:52	32:13
Ned Smith	15:02	14:29	29:31

WINGFOOT HANGAR LOCAL QUAL. TRIALS, Apr. 18, 1971

Eight entrants, six qualifiers			
Ron Ganser	19:05	18:38	37:43
Tom Sovo	18:27	17:59	36:26
Bill Hulbert	17:18	18:33	35:51
Dale Hacker	14:09	13:30	27:39
Vern Hacker	12:06	12:10	24:16
Rol Anderson	10:49	9:50	20:39

LAKEHURST LOCAL QUAL. TRIALS, Apr. 25, 1971

Five entrants, five qualifiers			
Dan Domina	5:00	5:02	10:02
John Kukon	5:00	5:02	10:02
Ernie Kopecky	5:00	5:01	10:01
Manny Radoff	5:00	4:59	9:59
Frank Parykaza	3:47	4:02	7:49

Qualifiers Via Contests

	Time	Top Time	%
Richard Hardcastle	7:23	7:23	100

RECORDS? MAYBE!

WINGFOOT HANGAR LOCAL QUAL. TRIALS, April 18, 1971

Jr. AMA Cat. II FAI - 17:59, Tom Sovo  
FAI Cat. III FAI - 18:27, Tom Sovo

SANTA ANA LOCAL QUAL. TRIALS, Apr. 11, 1971, 155' ceiling

Sr. Cat. III HL Stick - 24:54.3, Linda Randolph  
Sr. AMA Cat. III FAI - 24:54.3, Linda Randolph

TULSA LOCAL QUAL. TRIALS - Apr. 17, 1971

Sr. Cat. I HL Stick - 7:46, Robert Dunham II  
Sr. AMA Cat. I FAI - 7:46, Robert Dunham II

HAMPTON FAI LOCAL QUAL. TRIALS, Apr. 18, 1971 20'

Open AMA Cat. I FAI - 19:12, Hal Crane  
FAI Cat. I FAI - 20:45, Hal Crane

CONTEST CALENDAR

ALABAMA - Huntsville. Cat. II contest May 16, 1971, Madison County Coliseum. HLG - Jr. & Sr.-Op; Easy B - Jr.; Paper Stick, HL Stick and Peanut Scale - all ages comb. Jim Davidson, 1815 Melbourne Ave. NE, Huntsville, Ala. 35801 ph. 205-539-1509.

CALIFORNIA - Los Angeles. Cat. III Record Trials at Santa Ana Hangar, May 16, 1971; also PennyPlane. Sponsored by San Diego Orbiteers; Clarence Mather, 3860 Ecochee Ave., San Diego, Cal. 92117.

MARYLAND - Silver Spring. Indoor sessions at JFK High School, 1901 Randolph Rd., Silver Spring, May 14, May 21, May 28, 1971. Tom Vallee, 444 Henryton So., Laurel, Md.

MICHIGAN - Detroit. Annual State Meet, May 15-16, 1971 at Michigan State Fair Coliseum (65' ceiling). Youth contest w/HLG, AMA Cub and Pre-Fab on May 15; regular events on May 16 - HLG, Paper Stick, HL Stick, Scale. Walter Hartung, 14759 Kilbourne, Detroit ph. 527-7620.

NEW JERSEY - Lakehurst. Indoor sessions/contests at Hangar #5, May 16, June 13, July 3-4, 1971. C. V. Russo, 143 Willow Way, Clark, N. J. 07066.

NEW YORK - Hauppauge. Indoor sessions at Hauppauge Middle School Auditorium, 6:30 pm to 10 pm, May 20, June 10, June 24, 1971. Bob Sylvia, 28 Holiday Park Dr., Hauppauge, New York.

TEXAS - Dallas/Ft. Worth. Cat. II Indoor contest, May 9, 1971, 1:30 pm to 6:30 pm. HLG, Indoor Stick, Easy B. Contact Bud Tenny, Box 545, Richardson, Tex. 75080 ph. 214-235-4035 for site and directions.

VIRGINIA - Richmond. Flying sessions two Fridays each month in small Cat. I site. Contact Fred Harlow, 9724 Royerton Dr., Richmond, 23228, ph. 701-262-9112 for info on place and time.

STATE OF THE ART

Clarence Mather's biplane is only the third contest-type biplane we've heard about in recent years. A member of the Grumman Engineering Model Society (Karl Birkel, if memory serves correctly) had a small sport indoor biplane.

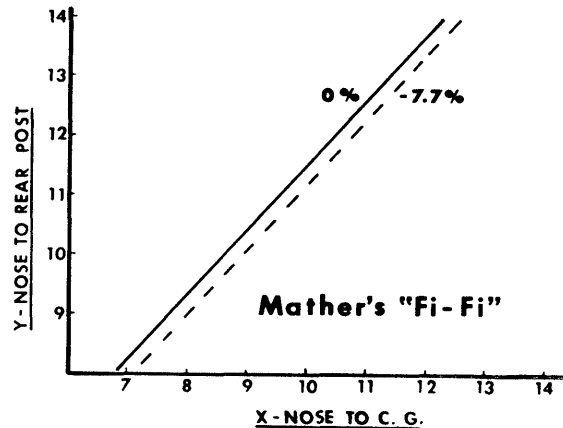
Besides that model, Hal Crane and Warren Williams flew biplanes which helped inspire Clarence Mather's efforts. It is characteristic of Clarence that his models fly well, and the model of the month is no exception. Clarence made these remarks about the model:

I decided a biplane would give a large wing area without the low aspect ratio required by a monoplane. I don't know what penalty is paid due to air flow interference, but I know the wings should be kept as far apart as possible. I decided to use slightly over one chord distance so that bracing wires and wood sizes could be of modest number. The wing has roughly the amount of wood bracing that a picket fence wing has, and the bracing system produced a strong, rigid wing set which has been steered several times without wing trouble. The 90 cm models of 1966 had about 200 sq. in. area for one gram, so this was my goal.

It all adds up to a lot of airplane to drag around, so I used a large prop and a big piece of rubber. The model checks out nicely and shows good potential, but I'm not sure it can keep up with conventional models or to geared models or other developments that surely will appear.

The first model had rounded tips on wing and stab and was slightly underweight, so I felt I could be more sporty with the second. I have flown the two alternately with the same prop and rubber in an effort to determine the better; about all I have concluded is that the raked tips are a better conversation piece. I call the tips "Baxter Tips" since Dick Baxter suggested them. Fudo Takagi noted that raked tips were declared most efficient for models by Joe Ott. Joe's book was copyrighted 1931!

Editorial Note: Clarence's choice of biplane configuration yielded 216 sq. in. with 25.4" projected span, or an apparent aspect ratio of 3:1. Biplanes are figured a bit differently, depending upon the gap between the wings. Hal Crane helped out here, by furnishing a reference from "Elements of Practical Aerodynamics"; Bradley Jones. The book's reference on Equivalent Monoplane Aspect Ratio, or EMAR, gives data which indicate Clarence's model has an equivalent aspect ratio of 3.9:1, or a gain of one-third over a 65 cm monoplane with the same area. This EMAR was used to compute the CMOS diagram below; Clarence flew his model at -7.7% margin (dashed line).



DESIGN FOOTNOTES

Low Wing Follow-Up

The April '71 issue contained speculative comments on possible benefits from lowering the wing of indoor models. In the comments below, Hal Crane presents a certain negative aspect of lowering the wing, while Dick Kowalski has comments which argue against the reasons stated for trying lower wing locations.

Hal Crane

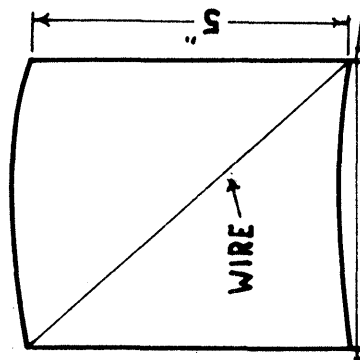
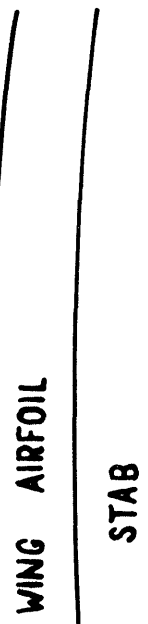
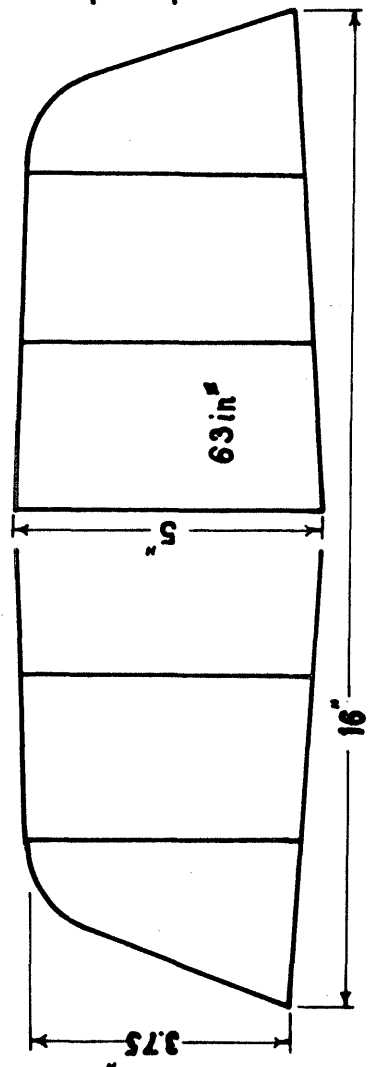
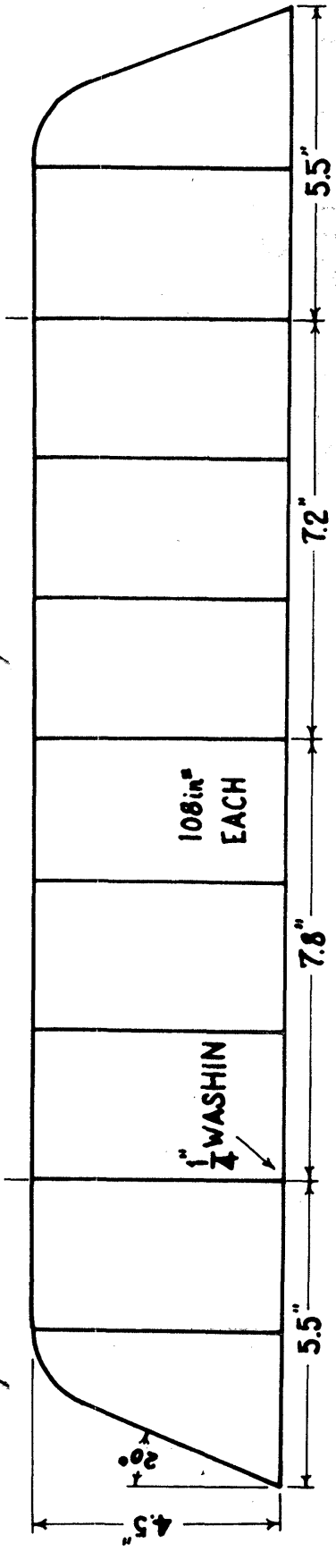
I've made a very convincing demonstration of the stability increase due to raising the wing. Using my old biplane EZB and flying with one wing at a time, the flights with bottom wing only stalled endlessly. By using the upper wing (longer wing posts) the flights smoothed out.

According to the text books, raising the wing with respect to the CG increases the static margin; that is, raising it 3" increases the static margin about 5%. That doesn't say it is easier to trim with a high wing if you have a large power burst; "soft" bracing to permit motor stick bracing will be more necessary with a higher wing.

Dick Kowalski

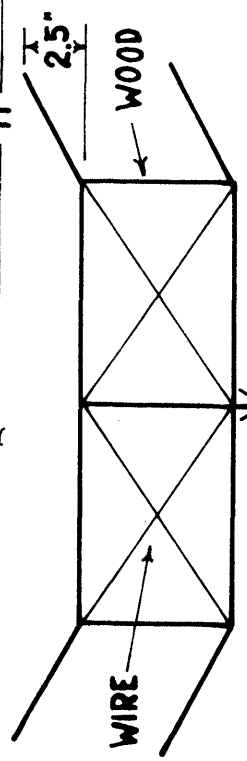
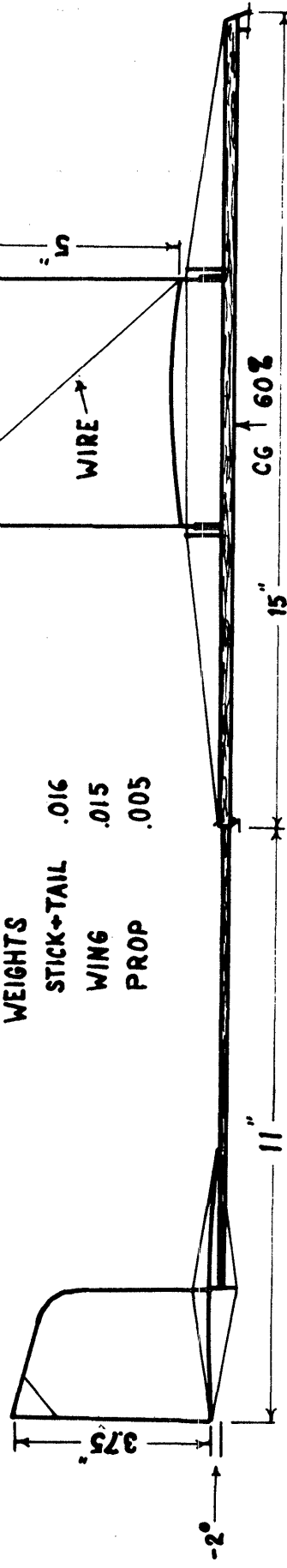
The April '71 column about wing section thickness is apparently based on a faulty assumption that thin wing profiles inherently climb faster than thicker sections. The



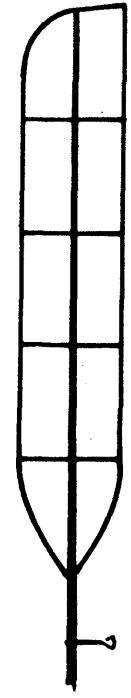


WEIGHTS

STICK+TAIL	.016
WING	.015
PROP	.005



*Ji Ji*  
1 GRAM FAI MODEL  
C.M. 3-71



POWER .065 X 20" PIRELLI  
BEST TIME 32:43 SANTA ANA

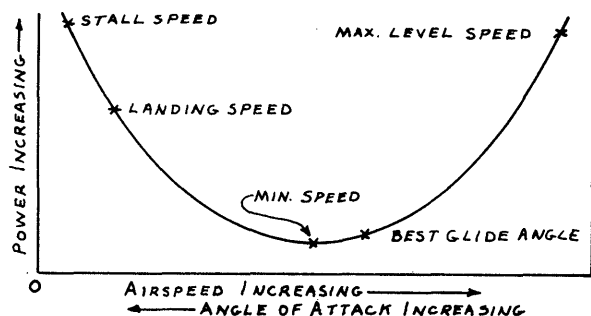
BRACING DETAIL - NO SCALE

idea presented was that thicker sections appear to give improved cruise performance, presumably because the model will fly slower or at a lower level flight RPM. This same section appears to have an inability to climb fast enough (or high enough) to reach maximum duration potential. Aside from the theory and rationalizations presented, I'm not convinced there is much difference if both types of aircraft are properly trimmed with prop matched to the model and flights are made with the objective "hit the roof".

From experience I can see how the idea got started. Meanwhile, I've had a number of hangar models using 7% and 4% sections that would climb like homesick angels; others with similar range of sections would hardly climb higher than my head. The reason can be understood by looking at typical performance curves from full size powered airplanes, where engine RPM is plotted against air speed. Basically, it is important to understand that a powered aircraft can be flown at any angle of attack from negative (perhaps  $-20^\circ$ ) to very high angles around  $20^\circ$  - up to the full stall angle. This must be qualified by saying "providing enough horsepower is available to maintain flight". It is also important to understand that there is only one point on that performance curve where the aircraft is flying at minimum sinking speed or "minimum power required" to maintain level flight. If we move in either direction on the curve we are less "efficient" even though we may be flying faster or slower. This point on the performance curve is usually just below the stall angle (where indoor models are usually trimmed to fly). If the aircraft is trimmed to fly slower than this "maximum efficiency" speed it will soon stall unless more power is applied. With more power it will keep on flying.

Such a process can be continued until the airplane is at full throttle; it will then stall at full power if we slow it up any more. (All the above does not apply to VTOL aircraft which have power in excess of any needed for vertical flight.)

In similar fashion we can decrease the angle of attack and the airplane will fly faster at a given throttle setting. This does not mean the new setting is more efficient; we are simply operating at a lower  $C_L/C_D$  relationship and using the power to provide speed instead of lift. This applies to level flight primarily, but can also be applied to climbing flight. In practice we can continue to lower the angle of attack until all available power is being used for speed or maximum climb angle, up to the limit of power available. Note the performance curve:



How do we make these flight changes in practice? On a full size airplane we pull back on the stick or set the trim tabs to increase angle of attack. On a model we use negative stabilizer angle. It is possible to trim a model so it will not climb at all under full power if you raise the stab trailing edge enough. Similarly, positive stab angles will cause the model to dive in under full power. Thus we can control climb angle and speed independent of the wing section used. Another factor complicates the application of these principles; prop pitch angle. Props can stall just as wings do, except at lower speeds due to a lower Reynolds number. High pitch props cannot tolerate slow models climbing at a high angle (flying on the back side of the power curve, so to speak) as well as can lower pitch props. Therefore I would recommend lower pitch props on thick wing sections when flown in hangars. If the pitch is already low, then the poor climb is probably due to poor trim or CG too far aft.

Returning to the column again, the observed superior cruise performance with thicker sections agrees very well with results from my glide studies. Sections with 4%, 5.5% and 7% camber were carefully tested at Reynolds numbers comparable to indoor models in level, climbing and descending flight. In all cases, the 7% section was superior to the others when trimmed for minimum sinking speed. Therefore, the thinner sections should climb slower at any given airspeed. There is an adverse positive

(nose up) pitching moment inherent with 7% sections (compared with 4% sections) for a given configuration. The correction to this problem should be an increase in stab incidence rather than shortening the wing posts. I've not looked at lower wing locations in detail, but it does occur to me that as the post height changes, the vertical CG also changes; the return on the investment may be very small although I'm not sure.

#### MORE ON TRIMMING

by Hal Crane

(Ed. Note - this can be considered a supplement to Hal's comments in the Jan. '71 INAV.)

For Cat. I with cluttered ceilings the launch torque must be reduced by backing off more turns - start with 50% as much as would be used at Willis. The climb of a model adjusted to scrub on the 20' ceiling at Willis would be about 100' in unlimited ceilings.

It is my impression that you can get about the same results in a 20' site with at least two approaches, each of which is a compromise situation. First, you can use rubber weight about 1.4 times the model weight (as applied by Bob Platt). Or, you can use a shorter motor stick and shorter, lighter rubber as I used two years ago on 655. Bob Champine and Tom Vallee have done well using this combination. 655 used rubber wt. of .9 W/A, while Champine's model (Sept. '69 INAV) used .75 W/A.

Both 655 and Platt's model (Dec. '70 INAV) weighed one gram, and both set new Cat. I records. Comparison of the times favors Platt's model, but now we have better props and larger wings than used on the other models. I guess the point that I'm trying to make is that you can do very well and have less breakage (in Cat. I) when using shorter motor sticks and lighter loops of rubber. The optimum motor for Cat. III would be between these two extremes in cross section, but would be wound to and launched at full torque. For example, launch torque on my models would be .3 in. oz. at Willis, .2 in. oz. for 35' maximum climb in unlimited ceiling, and .6 in. oz. at Lakehurst for a one gram FAI model. These launch torques can be increased if a flaring prop is used.

Of course, a motor stick that seems plenty strong in Cat. I may prove to be woefully weak in Cat. III - as Bob Champine and I found out in the '69 FAI Semi. It is best to have a lower pitch prop than you think you will need in the Cat. III site. This prop is reserve and can salvage something from a weak motor stick or give your climb a big shot in the arm.

#### ONE-MINUTE HLG FLIGHTS

by Dan Belleff

The following items will help you approach your first "One Minute" with an indoor glider.

**Model Construction:** Use a Sweepette to begin with, unless experience has proved this is not "your" glider. (Some people just don't "match up" with some designs.) Build it to about 19 grams with a good smooth finish. Use 10# fish line on the leading edge to minimize damage from hitting obstructions if you throw too hard. Use Tite-Bond white glue on the tail joints and finger grip, with Ambroid for wing joints. Build the fuselage from slightly lighter than medium hard balsa, but leave the tail boom thicker to reduce whip and flex. Any tail flexing or boom whip cuts down on altitude, so this is an important point.

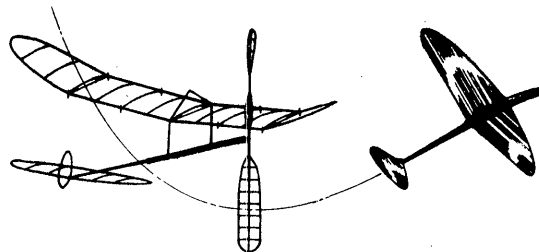
**Basic adjustments:** Use rudder only for turn if possible. Taper the rudder in cross section, but leave it just thick enough in the middle to cut down on flex. Using rudder instead of stab tilt for turn allows a gradually widening turn on the way down. With the wide turn, there will be little bank and more lift. All other adjustments should be the minimum needed for good recovery.

**Warm up:** Use an old, well-trimmed glider to locate the right spot on the floor to launch from, and mark the spot. Use this spot throughout the contest unless the drift pattern changes, since this will minimize collisions with obstacles. You can now use full launches with the new, almost-trimmed model without collecting so many "dinks" in its leading edge. There is no way to estimate how much time is lost from rough leading edges!

**Training:** The arm is important, but almost anyone who can get 50 seconds outdoors in dead air can get one minute indoors. In reality, you need to throw enough so you don't hurt your arm at a meet, and to retain control. Good control for indoor launches is essential - there aren't any thermals to make up for lost altitude!

**INDOOR****NEWS and VIEWS**

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080



## \*\*\*\*NATIONAL INDOOR MODEL AIRPLANE SOCIETY\*\*\*\*

New Members!

JOHN ANDBERG, 18600 Montpere Way, Saratoga, Cal. 95070

Change Of Address

TIBOR GALL, 302 Springvale, San Antonio, Tex. 78227

Help Wanted!

New member John Andberg (address above) would like to contact clubs and fliers in his area. John calls himself a "beginning beginner", but he is enthusiastic and without doubt is a willing student for any who will help him.

'71 Nats

The following information appeared in the Mid-April Competition News:

Indoor Events

The International Amphitheatre (4300 S. Halstead St., Chicago) has been approved as the site for Indoor Events of the 1971 Nats -- Monday and Tuesday as per the schedule published in the March CN. The facility is a Cat. II site, 87' ceiling. The floor area is 283' x 123'.

Special arrangements have been made to permit advance entrants (those who postmarked Nats entry forms to AMA HQ no later than June 21) to register and have certain problems taken care of at the International Amphitheatre, as follows. Late entries may only be made at Glenview NAS and on Monday only.

Monday, July 26, 9am to noon

a. Nats Registration (officially check in, obtain Nats identification and contestant information kit). This is necessary before any official flying takes place.

b. Housing Priority. For those who have such priority, it may be claimed.

c. Navy Meals. Tickets for same may be purchased.

d. Add Events. These may be entered and paid for.

e. Entry Discrepancies. Any money or entry form problems, indicated by "report to desk F" notation on entry form.

Tuesday, July 27, 9 am to noon

a. Nats Registration only, as "a" above. No housing, meals or event additions can be taken care of at the Indoor site on Tuesday.

b. Event discrepancies, as "e" above.

Nats Event Schedule

Monday, July 26 - Indoor HLG, Indoor Scale, PennyPlane. Schedule for presenting scale models will be published as soon as it is known; it will be early due to the need for proper judging.

Tuesday, July 27 - All indoor rubber events.

Note: Nats Entry Blanks are available from AMA HQ; send a stamped, self-addressed envelope with your request.

FAI INDOOR REPORTFinals Site Chosen

The 1971 Indoor Team Selection Finals will be held at Santa Ana MCAS, August 28-29, 1971. Contest procedure, flying times and all details not specifically spelled out by the Team Selection Program Rules (Nov. '70 INAV, Nov. '70 CN, Feb. '71 AAM) will be announced as soon as these have been decided. In addition, copies of these rules and all other pertinent information will be sent to all qualifiers who make it through the Semi-Final Trials.

Qualification Credentials

Some initial delay in dispatching verification of their status to Local qualifiers has been noted. Anyone

who knows or thinks he is qualified and has not received notification of this from AMA HQ should call Bud Tenny at 214-235-4035 as soon as possible for emergency verification of your status. It is important to call, since time for mail deliveries to most parts of the country would be doubtful (except for Detroit, assuming their June 19-20 date holds) in the time before Semi flying begins.

Preliminary Program Report

62 Open fliers and 2 Juniors entered the program by the deadline of May 15, 1971. Of these, 60 have qualified to enter the Semi-Finals. The higher percentage of qualifiers is due mostly to the provision which permits either a high score or high standing to count.

Entry in the Finals can reach as high as 42, provided all Local qualifiers enter a Semi-Final, and all Semi qualifiers enter the Finals. This may pose some problems at the Finals, but this is the reason for a two-day meet at the Finals.

A final reminder: fliers who qualified via a Local Qual. Trials must notify the first runner-up immediately if you decide not to enter a Semi-Final. Those who qualified in a contest do not have to notify anyone, but it would be appreciated if any such flier could notify Bud Tenny, Box 545, Richardson, Texas 75080 if he resigns.

Qualification Trial ResultsCHICAGO LOCAL QUAL. TRIALS, May 2, 1971, 25' ceiling

Four entrants, three qualifiers			
Howard Haupt	8:43	10:48	19:31
Charlie Sotich	9:21	9:02	18:23
Dave Linstrum	5:36	3:51	9:27

DETROIT LOCAL QUAL. TRIALS, May 9, 1971, 65' ceiling

Five entrants, four qualifiers			
Dick Kowalski	23:59	24:33	48:32
Al Rohrbaugh	20:55	20:25	41:30
Ed Stoll	21:37	18:32	40:09
Ron Plotzke	17:30	15:27	33:05

Qualifiers Via Contests

	Time	Top Time	%
George Batiuk	8:25	8:25	100
Stan Chilton	5:14	5:14	100
Bob Cowley	14:33.1	18:18.1	79
Bill Gibbons	4:00+	4:00+	100
Erwin Rodemsky	27:56	27:56	100
Fudo Takagi	22:07	27:56	79

Qualifiers Via Waiver

Dan Belieff

Team Selection Trials Schedule

CALIFORNIA - Santa Ana. West Coast Semi-Finals, June 13, 1971, 9 am to 9 pm. Two hour rounds will be flown, with model weights checked before each flight. Nat Antonielli, 3559 Chasewood Dr., San Diego, Cal. 92111.

COLORADO - Denver. Denver Semi-Finals, June 19, 1971, 8 am to 6 pm, Hinkley High School Gym, Aurora, Colo. Six 1½ hour rounds. 32' ceiling with 25' clear; floor 130' x 140'. Gym will open at 7 am on June 19 and will be open Friday evening June 18 for test flying. Ted Gonzoph, 12996 East 2nd Ave., Aurora, Colo. 80010.

MICHIGAN - Detroit. Northern Semi-Finals, June 19-20, 1971. Michigan State Fair Coliseum; one-half of site will be obstructed to 32' and will be available for testing, full 65' ceiling other side. Three 165 minute rounds beginning at 10 am, 1 pm and 4 pm on June 19; rounds begin at 9 am, 12 noon and 3 pm on June 20. Due to costs of removing and replacing valances from active end of site, all entrants will be asked to contribute \$2 above the normal entry fee. Paul Crowley, 32604 Tecla Dr., Warren, Mich. 48093 ph. 313-294-0266.

NEW JERSEY - Lakehurst. Eastern Semi-Finals, June 13, 1971. C. V. Russo, 143 Willow Way, Clark, N. J. 07066.

OKLAHOMA - Tulsa. Southern Semi-Finals, June 13, 1971, at John Mabee Gym, University of Tulsa. Due to a rental fee being charged, fliers will be asked to make a donation in addition to the entry fee. Details of rounds, flying time and ground rules will be furnished to Texas, Oklahoma, Kansas and Missouri qualifiers; others who plan to attend this Semi should contact Bud Tenny, Box 545, Richardson, Texas 75080 ph. 214-235-4035 to receive this info.

#### CONTEST CALENDAR

MARYLAND - College Park. Third Annual Eastern Indoor Championships, sponsored by the D. C. Maxcutors at the Cole Field House of the University of Maryland. HLG, Easy B, Paper Stick, Indoor Stick, Indoor Scale and Unorthodox Aircraft. Contact Tom Vallee, 444 Henryton So., Laurel, Md. 20810 for info and rules for Unorthodox Aircraft and Easy B.

NEW JERSEY - Lakehurst. Indoor contest at Hangar #5, July 3-4, 1971. C. V. Russo, 143 Willow Way, Clark, N. J.

NEW YORK - Hauppauge. Indoor sessions at Hauppauge Middle School Auditorium, 6:30 pm to 10 pm, June 10 and June 24, 1971. Bob Sylvia, 28 Holiday Park Dr., Hauppauge, N. Y.

#### INDOOR ELSEWHERE

Ove Pettersson and some friends have been pushing hard to get indoor going again in Sweden. Previous records dated back to 1953, with 5:03 being the top time. At a recent contest which was covered by television, fourteen fliers entered four events in the 33' ceiling site. The events were; FAI (65 cm), 35 cm microfilm, 25 Ores (PennyPlane rules except the 25 Ores coin weighs 2.2 g) and HLG. Partial results:

FAI			
Ove Pettersson	8:07	9:28	17:35
Peter Porho	5:39	5:40	11:09

35 cm			
Lennart Flodstrom	2:33	2:27	5:00

25 Ores			
F. Linden	2:10	2:34	4:44
S. O. Liden	1:55	1:58	3:53

HLG			
L. Wihd	:18	:20	:38
L. G. Olofsson	:18	:18	:36

#### New Swedish Records (set after contest)

FAI - 10:53, Ove Pettersson  
 35 cm - 4:27, Lennart Flodstrom  
 HLG - 0:20, Lennart Wihd

#### NIMAS POSTAL MEET

Entry in the Postal this year was slightly higher than last year, with all the increase in Easy B. Otherwise, the entry was almost identical in number to 1970. The two PennyPlane entries are included, even though five entries were requested to hold an event. The two Junior Easy B entries become the new Top Junior listing, and the top ten Open Easy B fliers become the new Top Ten Easy B.

JUNIOR EASY B	Time/ceiling	Fudge	Adj. Time
1. Danny Aggers	4:12.5/24'	1.22	5:07.8
2. Jimmy Clem	6:26/58'	.78	5:01.2

OPEN EASY B	Time/ceiling	Fudge	Adj. Time
1. Bob Platt	9:48.6/20'	1.33	13:06
2. Hal Crane	9:11.8/20'	1.33	12:13.8
3. Richard Hardcastle	11:23.6/31'	1.04	12:06
4. Clarence Mather	8:41.0/22.3'	1.26	10:56.4
5. Fudo Takagi	8:12.0/22.3'	1.26	10:19.8
6. Fred Harlow	6:42.0/20'	1.33	8:54.6
7. Chet Bukowski	7:08.0/25'	1.19	8:29.4
8. Richard Sherman	5:29.0/25'	1.19	6:31.8
9. Don Chancey	8:19.5/58'	.78	6:29.4
10. Jim Clem	8:15.0/58'	.78	6:26.4
11. Charles Learoyd	5:06.0/25'	1.19	6:04.2
12. Mike Fedor	7:45.0/58'	.78	6:03

JUNIOR HLG (25' ceiling)	Time/ceiling	Fudge	Adj. Time
1. Danny Aggers	52.0/24'	1.04	54.1

OPEN HLG	Time/ceiling	Fudge	Adj. Time
1. Richard Sherman	54.0/25'	1.0	54.0
2. Ed Winter	37.7/25'	1.0	37.7
3. Charles Learoyd	35.1/25'	1.0	35.1

OPEN PENNYPLANE*	Time/ceiling	Fudge	Adj. Time
1. Clarence Mather	4:40/22.3'	1.26	5:52.8
2. Bruce Cronhite	3:48/22.3'	1.26	4:47.4

\*These PennyPlane flights were made with a "no touch" rule which was an original part of the Aeronut rules.

#### STATE OF THE ART

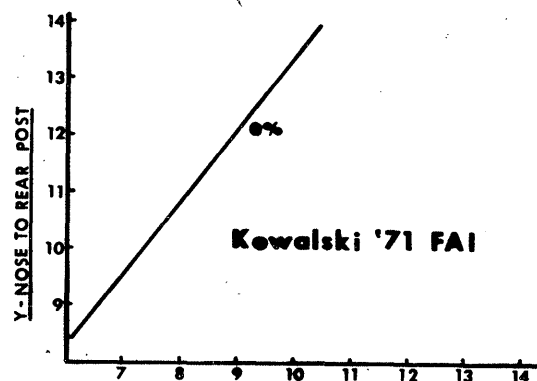
As will be seen elsewhere, Dick Kowalski topped other Detroit Local qualifiers and set two probable records in the May 9 Detroit Local Qual. Trials. The model he used is shown on the plan page and is interesting in that Dick departed from his recent design and construction practice and still achieved excellent performance.

These departures are: no stressed wing structure, no taut film, and low aspect ratio wings. As usual, the model is the result of considerable glide testing which revealed the following:

1. Slack covering gave no worse sinking speed than tight film, and in some cases gave improved sinking speed. This Dick is unable to explain yet, but he feels that wrinkles in the film may serve as turbulators which tend to reduce drag (and decrease sinking speed).
2. 7 1/2" chord seems to be optimum for the span and weight limitations involved, based on analysis of tests on chords ranging from 7" to 10", even though lighter wing loadings result from wider chords.
3. 40% tailplane area gives reduction in sinking speed over the 33-37% often used. Larger stabs would give more performance, but structural considerations dictated this limit.

Dick's decision for slack film reinforced the earlier decision to bypass the considerable design development time inherent in stressed structures. By combining these features, he saved considerable building time. In summary Dick said, "It seems almost ironic that the model's proportions and general configuration have evolved into what appears to be very much like my SLI-FAI design of 1961. It makes a guy wonder why he spent nearly 10 years learning about and investigating theory that tells him his best guess was pretty good?"

The two record flights were made under the altitude of 55', without touching anything. No particular effort was made to limit climb. The prop was a progressive flaring (so-called) type very similar to the Kalina design shown in Dec. '68 INAV. Currently the ship flies in about 16' diameter circles with extreme wing twist and tail tilt. Dick thinks the model has some way to go before it will be finely trimmed for maximum duration, since it has only been flown at two sessions. Basic trim on the model was set up equivalent to 0% margin as computed for the CMOS chart below.



X-NOSE TO C.G.

IHLG - NATS STRATEGY

by The Observer

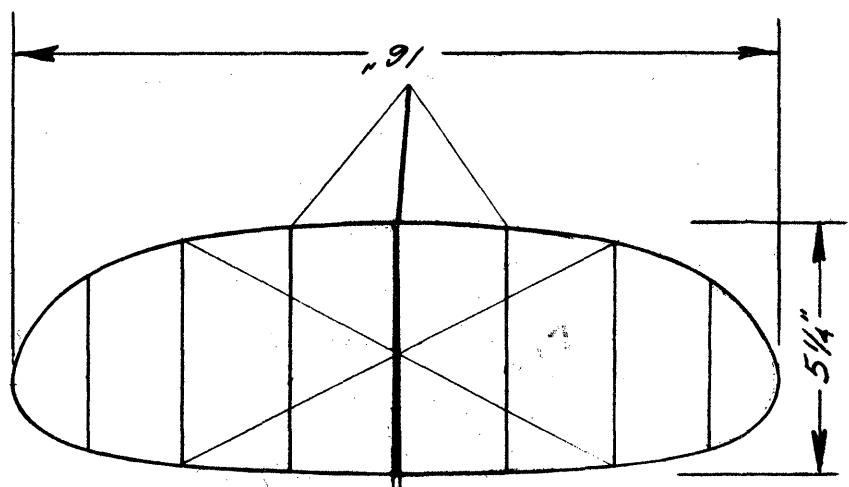
When talking about HLG flying, we must define what ceiling height is under discussion. There are really five different areas: 10-20', 20-35', 35-50', 50-90' and 90+'. Let's pass the first three which offer competition and enjoyment and go to the higher ceilings.

Take the Nats for example: If you are there, what do you want to do? Have fun or win? Better to have fun winning! Let's say you want to place in the Nats in open indoor hand launch glider - you can if you follow these simple instructions.

Forget the airplane for a moment - get in shape yourself. All the fliers who make top times at the Nats have had their arms in good shape regardless of what shape the rest of their is in.

Getting in shape can mean doing push-ups, tying your arm to a tree with a rubber band, or throwing rocks. The most logical idea is to throw outdoor gliders; make some heavy clunk and throw it every chance you get all winter.

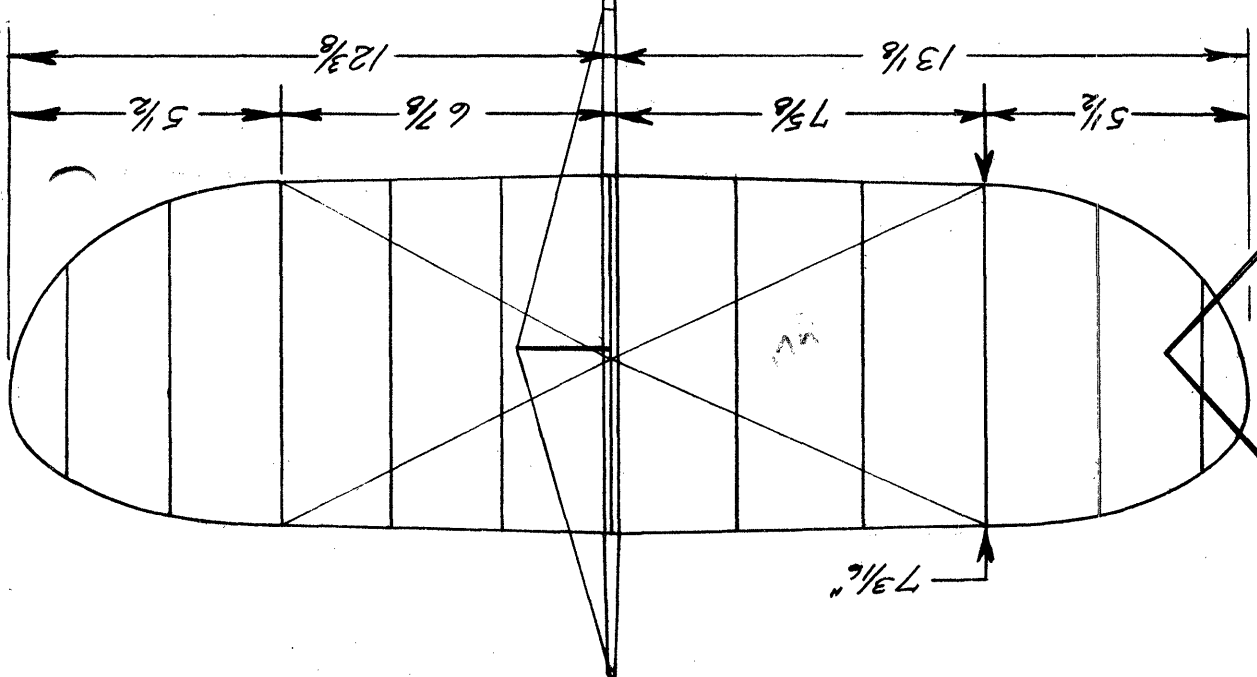
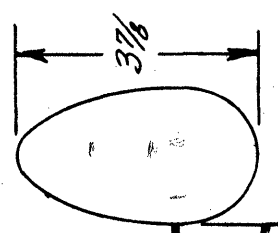
WING	.01150
STICK	.01110
STAB	.00340
BOOM	.00260
FIN	.00050
PROP	.00650
TOTAL	.03560



44%

1971 FAI INDOOR QUALIFICATIONS  
 MAY 9 - DETROIT MICH - 65' CEILING  
 23:59 & 24:33

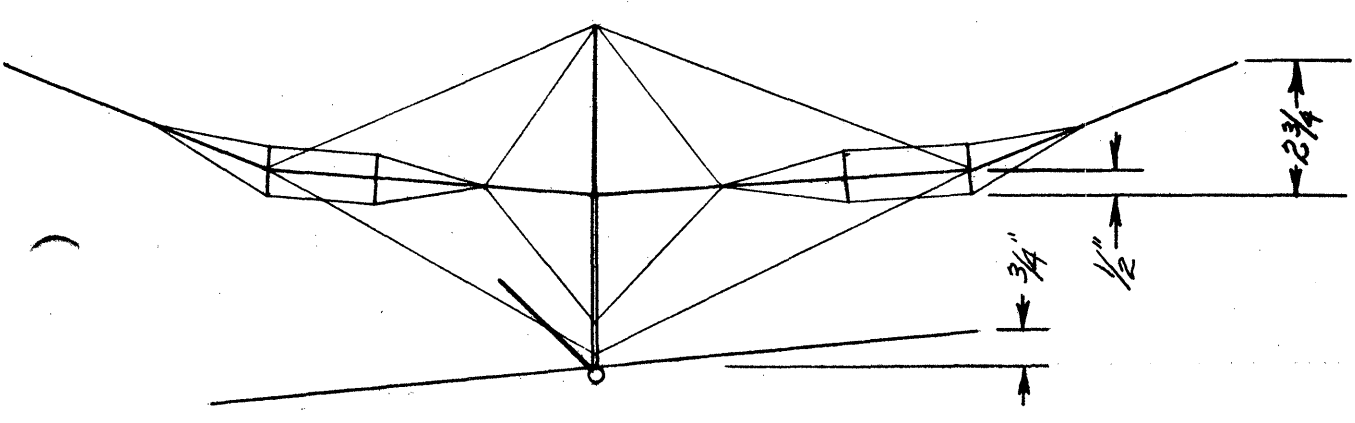
DESIGN BY DICK KOMALSKI



7 3/16"

C.G. 63%

PROP - 1 7/8 DIA X 35 PITCH  
 RUBBER - 16 1/2" OF .055



Now that you're in shape, let's assume you are at the Nats with six super-flams. In the morning when flying starts, 150 guys rush out and start taking official flights. Don't do it; the floor is pure bedlam. Even if your ship got up and locked in, its times would be torn up by the turbulent air that reaches as high as 20' above the floor. All you hear is the sound of smashing gliders and the call "Official!"

Sneak off into a corner and get the glide slow and smooth with a nice circle.

About two hours after official flying begins, all the outdoor gliders will be broken and the casual fliers have thrown out their arms. Now you can work on your pattern.

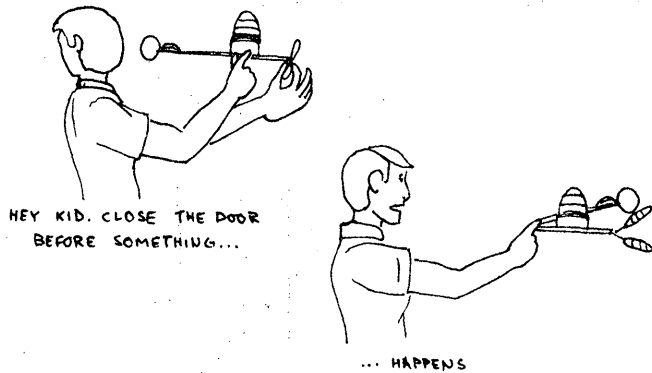
Take it easy to avoid throwing out your arm or breaking your models. Find a spot and launch direction that will get you up and recover without snaring any hanging junk. Also find a place where there is lift. Are there thermals indoors? You bet! If the site has windows where the afternoon sun hits the floor, get there. Otherwise stay near the center.

Now it should be near the end of the flying time and the air should be smooth and the floor free of bodies. Begin about an hour before the end of official flying and take official flights; get some friends to keep the clydes away from your ship as it nears the floor. The event is won or lost in the last 6' of glide, and people frown if you clobber anyone who gets in front of your ship.

Finally, consider the ship itself. If you have some objection to flying Sweepettes, get a Zaic Year Book and plagiarize. High ceiling gliders are creatures of evolution, so radical departures from the norm will likely be a waste of time and wood.

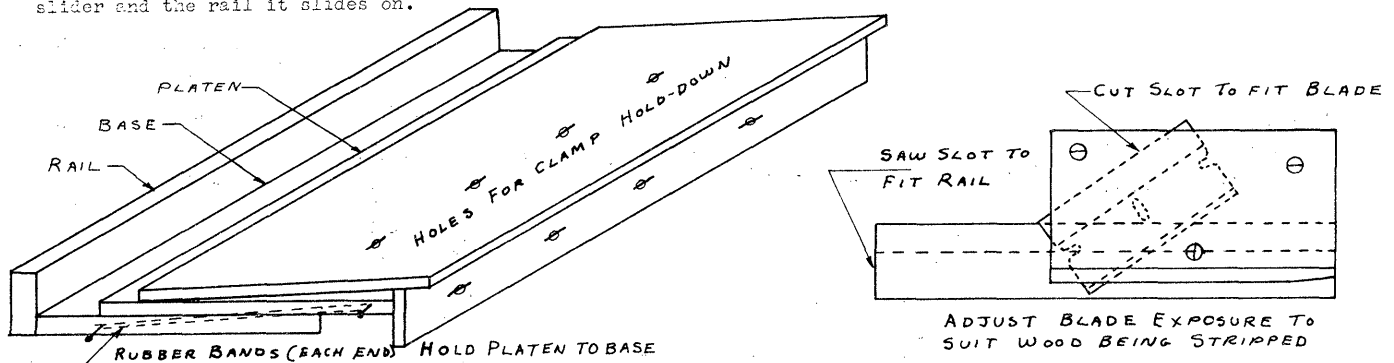
So there you are. If this all seems harsh, remember that you are there to win, not play.

(Ed. note: The above came in earlier this year, and was signed with the note "Information from six Nats". Who the author is is open to speculation, but we have our suspicions!)



#### BALSA STRIPPER

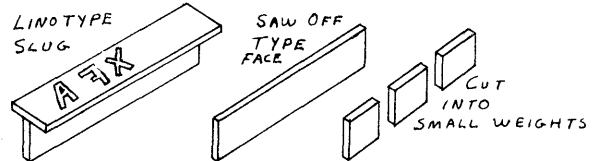
The May '64 INAV featured a balsa stripper by Bill Atwood which used micrometer heads to position the straight edge with excellent accuracy. The one shown below, designed by Hewitt Phillips, is also capable of good accuracy. It sacrifices the micrometer readout for the important feature of using materials 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.



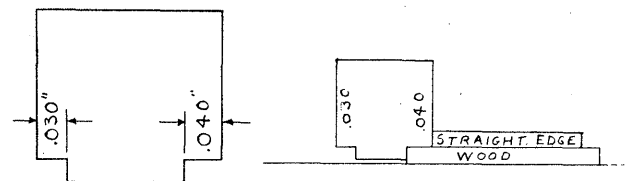
## HINTS AND KINKS

### Three Building Hints

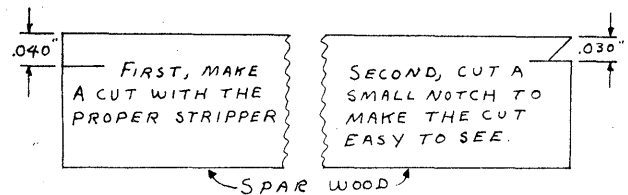
Dave Linstrum suggests a handy source for small building weights: Get some used linotype slugs, saw off the type face and saw the remaining slug into pieces about  $3/16"$  x  $1/2"$  x  $3/4"$ . Finally, glue small pieces of garnet paper to the weights to keep them from slipping around on the board (lead is slick when sawed).

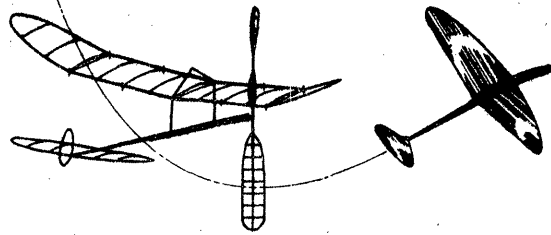


Paul Crowley suggests this method for making matched sets of tapered spars: If the spars are to be double tapered, first sand one taper into the sheet of balsa, then use a gage like that shown below to line up the straight edge to the proper distances from the edge of the balsa. The gage shown makes spars which taper from  $.040"$  wide to  $.030"$  wide.



If you happen to have some balsa strippers around, they can be used in place of the gage shown above to make tapered spars. Taper the balsa sheet just as outlined above, then make a short cut with strippers of the proper size at each end. In the example sketched below, the desired spar tapers from  $.040"$  to  $.030"$ , so make a short cut with a  $.040"$  stripper at the heavy end of the wood and a cut at the opposite end of the wood with a  $.030"$  stripper. Now, notch from the edge of the spar down to the stripper slot so that spar dimensions are clearly defined, place the wood on a dark background, and align the straight edge with the bottom of the notch to cut the spar. This gives spars with a bevel on the end which helps you to orient the spars properly when splicing.



**INDOOR****NEWS and VIEWS** Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

## SPECIAL NATS INFORMATION

FURNISHED BY AMA HEADQUARTERS

**LAST MINUTE CHANGE FOR NATS INDOOR SITE!**

The Nats Indoor site has been changed from the Chicago Amphitheater to the Washington Park Armory (same site as used for last year's Nats.)

This is the solution to a panic situation which developed in mid-July -- we found out that the Amphitheater management had booked a closed-circuit TV show for Nats Monday. This would have prevented use of the site on both Indoor days, due to thousands of chairs being involved, covering the entire floor area.

Quick action, however, by Nats Free Flight Director Pete Sotich, of Chicago, saved the day. With the help of the Navy he was able to arrange a switch to the Armory used for last year's events. Thus, the original Nats Indoor schedule will be maintained as published -- only the location will be different.

## \*\*\*\*NATIONAL INDOOR MODEL AIRPLANE SOCIETY\*\*\*\*

New Members!

JAMES CUCCI, JR., 61 Blackstone Rd., Attleboro, MA. 02703  
RICHARD DOIG, 2370 Hammond Lake Dr., Pontiac, Mich. 48053  
EDDIE SAULTS, OCLA Box 3251, Chickasha, Okla. 73018

Honorary Members

MARTIN SHEPHERD, Southbourne Hilliers Close, Sutton,  
Courtenay, Berkshire, England  
DARRYL WHITE, 2 Ryan Street, Rutherford 2320, N.S.W.  
Australia

Change of Address

BOB CLEMENS, 95 Shoreway Dr., Rochester, N. Y. 14612

An Apology

This issue is late, and is likely to be somewhat abbreviated, for reasons you can guess as you read of some few crises which have plagued us lately!

Further, the May issue had an error in the presentation of Clarence Mather's biplane. The stability margin was really +13%; anyone who wishes to have a revised CMOS diagram may have one by sending a stamped envelope with the request.

FAI FF Deadline Near

Dave Linstrum, FAI FF Chairman, has asked that this reminder be made: the deadline for FAI FF qualification is August 1, 1971.

PennyPlane Kits!

This is probably too late (see above) but: The Chicago Aeronauts, who will sponsor PennyPlane at the 1971 Nats, intend to produce a limited number of kits for Sotich's "DUFFER DIP" (see VTO, June '71 MAN). These kits are free to those who declare an intent to fly them at the Nats. When kits are exhausted, plans will be sent. Send your request for a kit along with a declaration of intent and 40¢ in stamps to: PennyPlane Kit, 672 Plum Grove Circle, Buffalo Grove, Ill. 60090.

More Nats Info

The Nats Entry Blank listed Indoor HLG and Scale as being held 9 am to 9 pm; the listing is identical to last year, including a typographical error in some outdoor events! Anyway, as last year, HLG will be from 9 am to 3 pm, with Scale from 3 pm to 9 pm. A special program of alternating test flying and official flying is under consideration; providing certain administrative problems can be worked out, it may be used. The reason for trying this approach is to completely clear the flight area of

**TWO OTHER NOTES SHOULD BE MADE BY THOSE CONCERNED:**

The name of the Washington Park Armory has been changed since last year -- it is now known as the Brig. Gen. Richard L. Jones Armory. But it is still in the same place! The address is 5200 S. Cottage Grove Ave., on the SE side of Chicago.

The ceiling is practically the same - about 90 feet.

Note further that there is a bad traffic situation in the Chicago area. Edens and Dan Ryan Expressways are under repair. Extra time (lots) should be allowed for driving to the Armory.

all fliers except those making official flights. Final details will appear in the contestant packets, if this plan is adopted.

International Postal Challenge

John Malkin, Upper Hutt, New Zealand, has issued a postal challenge to any other clubs who wish to accept his offer made in behalf of the Wellington Club. Their site is 26', and they wish to fly Easy B and HLG. Standard NIMAS fudge factor is acceptable for Easy B, and something may have to be worked out on HLG. They suggest three man teams for each event, with no limit on teams entered, "but contest to be determined by club with smallest number of teams." This is not clear, so those interested may want to inquire into the meaning. John mentioned dates (their sessions) of Aug. 29 and Oct. 31, 1971. John's address is 51 Clyma St., Upper Hutt, New Zealand. Use air mail, since seammil is very slow!

FAI INDOOR REPORTA Modern Fable

Once upon a time, long, long ago, some exceedingly wise Elders of AMA noted that Princes in charge of FAI Programs had a tendency to become embroiled in Controversy. In their Wisdom, they established several Wise and Proper Edicts to prevent the People from Uprising.

Unfortunately, the Scribe's paper supply was exhausted at a crucial time and the wisest Rule of all had to be transcribed on the back of a torn and tattered envelope. The Town Crier, upon receiving these commandments, failed to examine the envelope and used it as a taper to light his torch. Thus the Rule was lost to sight and no one ever heard of it; nor was it posted for those who would read it.

In their wisdom, the Elders had designed the Rule "to prevent the Princes of the Programs from becoming unpopular with their subjects." Alas! Without the envelope (long since turned to ashes), these same Princes knew not the Rule. Thus it came to pass that a Prince made some decisions based on honorable and historical Precedent, but not conforming to the Rule.

As could be predicted, when the decisions were hard and both sides had nearly equal merit, the people rose up in anger. Some were reasonable, and presented Fair and Reasoned Arguments; others raged and frothed at the Mouth, making Exceeding Foolish and Inflammatory Charges. All this took place at the 11th hour, mind you - and Something Had To Be Done.

Thus it came to pass, months after the appropriate time to apply the accumulated Wisdom of The Elders, one Elder finally remembered the Rule. A Royal Edict was sent forth, commanding the Prince to Cease And Desist. The Elder had no Helpful Suggestions to relieve the situation and Placate The People, for yea and verily the people were half for and half against the Prince's Decisions. And the Prince was sorely vexed and perplexed, for he had labored long and mightily against Great Odds that his Program should bear Good Fruit.



Anatomy of a Decision

1964 (apparently, no exact date is available) Several policies were set forth for operation of FAI Programs, probably by AMA's Executive Council. The best-known of these policies is a prohibition of program Chairmen from competing in their own programs. For the purpose of this report, the most important policy can be stated approximately thus: "FAI Finals sites shall be central in location, unless approved by a majority of the Finalists, or unless approved by the Executive Director, the President's FAI Program Delegate and the AMA-FAI Coordinator." Such an approximation must be made because the policy has never been published anywhere, and has never been given to any member of any Indoor Committee until July 3, 1971.

Dec. '70 England's offer to host '72 WCh at Cardington was accepted tentatively by CIAM. As a result, it was decided that a hangar would be the most appropriate site for the U. S. Finals. The reason is that every year since 1963 (the first unified Finals) the Finals site matched the expected WCh site as closely as possible. The sole exception was 1966, but the Team was chosen before the WCh site was shifted to Debrecen, Hungary.

Apr. '72 A request was made to contacts at both Santa Ana and Lakehurst to determine if either or both hangars would be available in August.

May 15, 1971 End of program registration and qualification. At this time it was determined that the geographical distribution of qualifiers was essentially equal with respect to the hangars. That is, 48.5% of the qualifiers lived within 1400 miles of Santa Ana, while 51.5% lived within 1400 miles of Lakehurst.

May 28, '71 (approx.) Available dates were received for both hangars. After careful consideration of all factors, Santa Ana was chosen on the basis it is the best site and most likely to have good conditions.

June 3, 1971 INAV sent to printer containing announcement of Finals site; mail distribution should have been complete by June 8, 1971.

Mid June '71 Choice of Santa Ana hotly debated at Detroit and Lakehurst Semi-Finals. Pressure brought to bear on Chairman and AMA Hq. A poll of the Indoor Committee at the request of Detroit area yielded narrow margin of support for Santa Ana decision.

July 3, 1971 Chairman receives "cease and desist" order based on previously unknown "established policy".

July 6, 1971 Chairman's answer received by Worth, Patton and Hill.

July 12, 1971 Worth, Patton and Hill propose use of three Finals sites; Santa Ana, Lakehurst and Nats.

July 14, 1971 Above proposal withdrawn due to impossibly short time to notify Finalists who might want to compete at Nats. Acceptance was gained for Chairman's proposal to take poll of Finalists in full compliance with 1964 policy.

July 16, 1971 Poll form sent to all Finalists regardless of whether they had resigned after Semi-Finals.

Aug. 6, 1971 Deadline for return of poll. Results of poll will be strictly followed; a 60% majority is necessary for adoption of any proposal to adopt a new site or new program philosophy for this year.

Results From Semi-Finals

West Coast Semi-Finals, June 13, 1971 Santa Ana Hangar  
13 entrants, 10 qualifiers

1. Bud Romak	33:07	30:40	64:34	100%
2. Erwin Rodemsky	31:25	32:50	64:15	98%
3. Larry Cailliau	29:40	33:05	62:45	95%
4. Bob Gibbs	27:03	31:59	59:02	90%
5. Bob Randolph	27:45	29:41	57:26	88%
6. Clarence Mather	28:25	27:02	55:27	85%
7. Paul Allen	28:27	25:50	54:17	84%
8. Linda Randolph	27:16	26:49	54:05	84%
9. Carl Rambo	25:46	26:03	51:49	80%
10. Joe Bilgri	26:41	25:00	51:41	80%
11. Fudo Takagi	23:18	24:38	47:56	74%
12. Warren Williams	18:57	23:01	41:58	65%
13. Larry Parsons	no time			

Tulsa Semi-Finals, June 13, 1971 John MaBee Gym 30' 10"

Six entrants, five qualifiers				
1. Paul Tryon	12:19	12:38	24:57	100%
2. Dick Ganslen	12:41	11:59	24:40	98%
3. Bob Dunham	12:00	11:49	23:49	95%

4. John English	8:49	13:35	22:34	90%
5. Robert Dunham II	9:18	12:59	22:17	89%
6. Jim Clem	8:08	10:29	18:37	74%

East Coast Semi-Finals, June 13, 1971, Lakehurst #5

13 entrants, 9 qualifiers				
1. Bob Champine	30:56	33:32	64:28	100%
2. S. Cannizzo	30:20	31:52	62:12	96%
3. C. V. Russco	31:31	30:25	61:56	95%
4. Bob Platt	30:22	29:49	60:11	93%
5. Hal Crane	29:16	30:02	59:18	92%
6. Ron Ganser	25:25	29:06	54:31	85%
7. Emanuel Radoff	26:17	27:37	53:54	83%
8. John Triolo	26:06	26:50	52:56	81%
9. Tom Vallee	24:15	25:56	50:11	78%
10. Ernie Kopecky	24:20	24:32	48:52	76%
11. John Kukon	20:38	23:46	44:24	69%
12. Dan Belleff	14:38	13:53	28:35	44%
13. Fred Harlow	18:20		18:20	28%

Detroit Semi-Finals, June 19, 1971 State Fair Coliseum

Eight entrants, five qualifiers				
1. Bill Hulbert	22:52	24:23	47:15	100%
2. Dick Kowalski	20:34	23:50	45:24	96%
3. Ed Stoll	21:07	21:32	42:39	90%
4. Ron Plotzke	18:52	20:24	39:16	83%
5. Bob Cowley	22:12	17:03	39:15	83%
6. Tom Sova	18:36	18:20	36:56	78%
7. Howard Haupt	16:58	19:51	36:49	78%
8. Rol Anderson	15:55	12:23	28:18	60%

Denver Semi-Finals, June 19, 1971 Hinkley High School Gym

Six entrants, five qualifiers				
1. Ted Gonzoph	11:25	12:13	23:38	100%
2. George Batiuk, Jr.	10:07	11:23	21:30	91%
3. Hal Blubaugh	10:34	10:35	21:09	90%
4. Stan Chilton	8:19	11:27	19:46	84%
5. Ed Collins	9:13	10:29	19:42	84%
6. George Batiuk, Sr.	2:34	6:51	9:25	40%

RECORDS? MAYBE!

The June issue should have listed some of these marks, and some of them have already been approved.

Open Cat. III Cabin - 29:22, Bob Randolph 5/16/71

Sr. AMA Cat. III FAI - 27:16, Linda Randolph 6/13/71  
Sr. Cat. III Indoor Stick - 27:16, Linda Randolph 6/13/71

Open AMA Cat. III FAI - 33:32, Bob Champine 6/13/71

Sr. AMA Cat. I FAI - 12:59, Robert Dunham II 6/13/71  
Sr. Cat. I Indoor Stick - 12:59, Robert Dunham II, 6/13/61

Jr. AMA Cat. II FAI - 18:36, Tom Sova 6/19/71

Open FAI Cat. IV FAI - 33:57, Ron Plotzke 7/4/71

Almost Records:

Clarence Mather's D made a steered flight of 45:50 at the Santa Ana Semi-Finals; with steering, this did not qualify as an AMA record and a World Record sanction was not in effect. Also, a Cat. IV World Record needs to exceed 46:35 to satisfy the 2% requirement.

Ron Plotzke's "300" made a hit at the Lakehurst July 4 bash, as it turned 41:10 after landing on an obstruction. The mark Ron was after was Kopecky's 43:42, set at Santa Ana in 1963; this is a new absolute high time at any Lakehurst hangar.

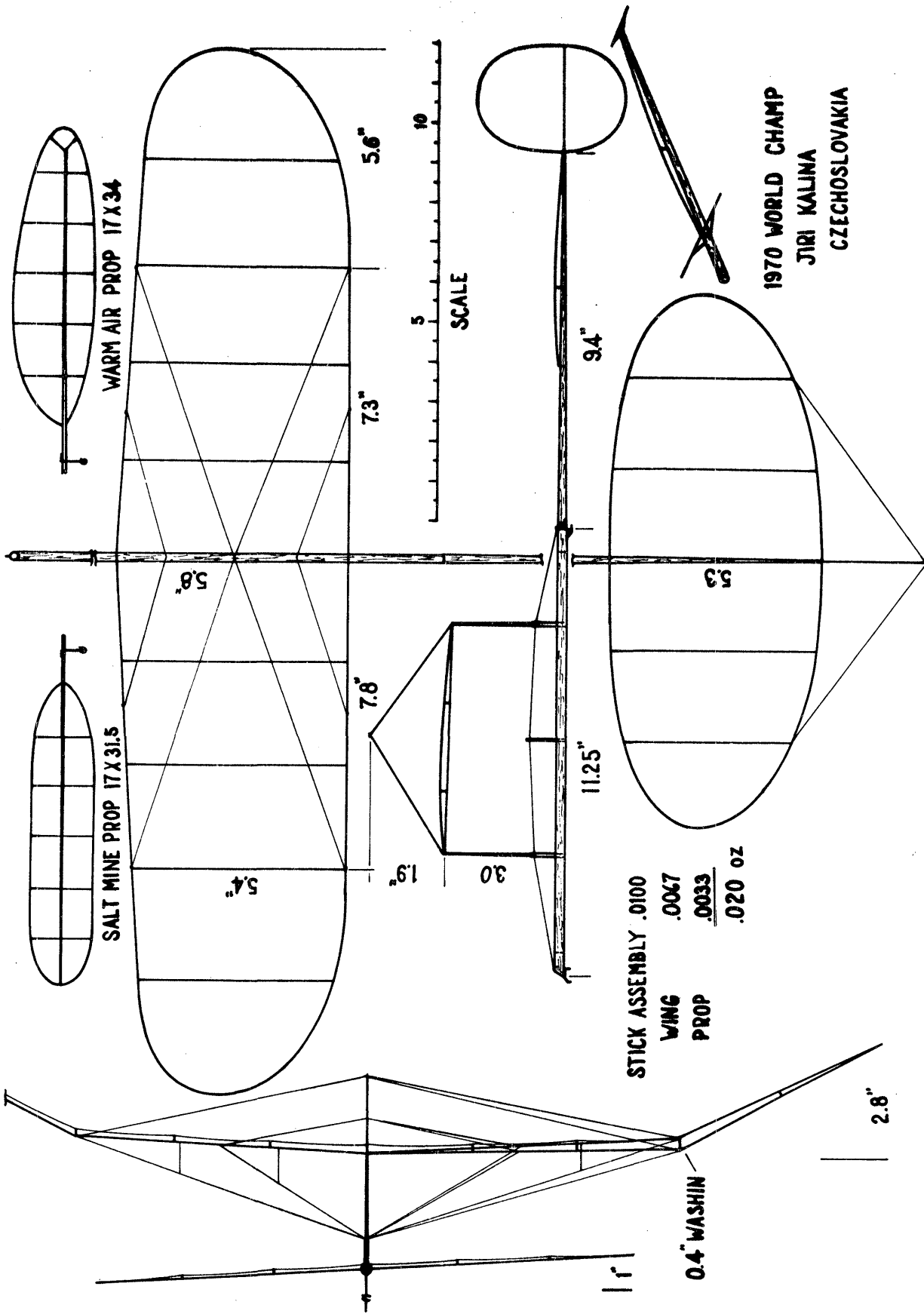
CONTEST CALENDAR

MARYLAND - College Park. Third Annual Eastern Indoor Championships, sponsored by the D.C. Maxcutors at the Cole Field House of the University of Maryland. HLG, Easy B, Paper Stick, Indoor Stick, Indoor Scale and Unorthodox Aircraft. Contact Tom Vallee, 444 Henryton So., Laurel, Md. 20810 301-498-0790 for more info and rules for Easy B and Unorthodox Aircraft.

STATE OF THE ART

Jiri Kalina's 1970 World Champion model was chosen as the NFFS Top Ten Indoor model, and full size plans are or will be available from NFFS for the model. Due to the press of time, only the plan as drawn by Clarence Mather will appear in this issue. Clarence has compiled a very comprehensive study on Jiri's model (he traded models with Jiri at the '70 WCh), which will be presented either in August or September.

*Richmond 169 FAI  
June 9/1/75*

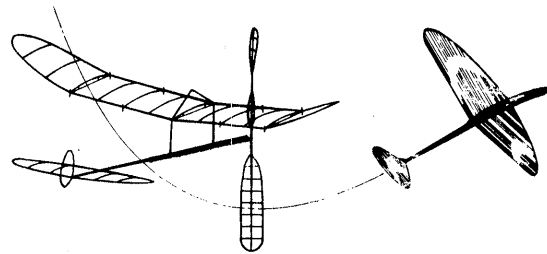


1970 WORLD CHAMP  
 JIRI KALINA  
 CZECHOSLOVAKIA

# INDOOR

## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080



### Indoor Stick

Junior	
1. Gerry Geraghty	15:43.0
2. Gregory Simon	13:12.4
3. Bryan Baetens	10:07.0
4. Patrick Wood	9:43.2
5. William Schlarb	8:54.2
6. Bruce Paillet	8:51.0
7. Barry Paillet	8:35.0

### Senior

1. Ronny Ganser	24:19.0
2. Bobby Dunham	18:41.4
3. Tom Sova	18:31.8
4. Dale Hacker	14:41.6
5. William Shailor	14:11.3
6. Jim Haught	11:20.0
7. Jeff Annis	10:39.2
8. Steve Bandt	6:13.4
9. Richard Doig	0:12.2

### Open

1. Jim Richmond	33:54.0
2. Ron Plotzke	29:43.4
3. Ed Stoll	27:25.0
4. Charlie Sotich	27:04.0
5. Dan Belieff	26:49.0
6. Bucky Servaites	26:30.6
7. Dick Hardcastle	25:36.8
8. Bob Randolph	23:33.0
9. Al Rohrbaugh	22:52.0
10. Dennis Jaecks	22:19.6

### Paper Stick

Junior	
1. Gregory Simon	13:05.6
2. Gerry Geraghty	10:58.2
3. Bryan Baetens	9:55.4
4. Bruce Paillet	9:29.4
5. Barry Paillet	8:48.8
6. Chris Clemens	8:30.0
7. Scott Wisniewski	8:21.8
8. Fritz Curth	8:20.2
9. Patrick Wood	7:22.4
10. Andy Tomasch	6:30.2

### Senior

1. Tom Sova	17:10.4
2. Bobby Dunham	13:23.6
3. Ronny Ganser	12:40.6
4. William Shailor	11:17.2
5. Jim Haught	10:47.6
6. Michael Kuehne	10:09.4
7. David Kummerow	5:32.0
8. Larry Reimer	2:12.0
9. Richard Doig	0:31.2
10. Jeff Annis	0:09.0

### Open

1. Jim Richmond	21:37.0
2. Ed Stoll	19:32.0
3. Hardy Brodersen	19:18.0
4. Al Rohrbaugh	19:04.6
5. Larry Cailliau	18:04.0
6. Bob Randolph	17:26.8
7. Joseph Sova	16:43.8
8. Dick Hardcastle	16:43.8
9. Rolland Anderson	15:46.0
10. Dennis Jaecks	15:23.4

### THE NATS STORY

The Indoor Nats was a mixture of new and old, with about the same entry, higher average performance, and a new look in a couple of areas. HLG, Scale and PennyPlane were all flown the first day this year, leaving rubber fliers an extra day to observe if they desired. Another innovation was in HLG - test flying and official flying were separated into half-hour periods, except that any contestant who wished to fly official flights during a test flying session was permitted to "at his own risk". The experiment worked well enough that those who were still around to be polled after HLG was over voted to retain the idea. It was established that only fliers who carried a blue streamer were permitted to be on the floor during an "official" session; most of the few violators weren't in a position to see the admittedly inadequate sign which proclaimed which session was in effect. It is expected that next time a flashing light or blinker will be used to denote official flying sessions, and this should minimize the communications problem.

It is difficult to keep track of who flies which model design, but it has been reported that Sweepettes and Sweepette derivatives won most of the HLG places. Except for 1st in Junior and Open, the average performance was higher across the board in HLG. Junior and Senior times were new records, while Rudy Kluber improved 10 seconds from last year to win 1st with a time still short of the 1970 winning time. An interesting sidelight - Scale judging was going on in a corner of the site. When asked if stray gliders were causing a problem, George Pharr (one of the Judges) said, "Oh no. We just catch them like this!" To demonstrate, he made a clapping motion as if to catch a mosquito!

Both days, traffic problems due to Chicago freeway repairs caused late arrivals; it seemed to be worse on the second day. Very few fliers were in evidence until later, but there never seemed to be much aerial congestion. Except for 1st in Open Stick and Paper Stick, the average performance was again higher. Since Jim Richmond did it again with the same models as last year, these two times were about the same. It took Jim a few more flights in

### Indoor Cabin

Junior	
1. Gregory Simon	11:41.8
2. Barry Paillet	6:35.0
3. Patrick Wood	5:35.0
4. William Schlarb	4:33.8
5. Bruce Paillet	3:38.4
6. William Wood	3:01.2

### Senior

1. Ronny Ganser	15:23.0
2. Tom Sova	14:57.0
3. Bobby Dunham	11:20.0
4. Michael Kuehne	9:26.4
5. Michael Wood	4:36.2
6. Jim Haught	0:06.6

### Open

1. Ron Plotzke	23:03.6
2. Al Rohrbaugh	21:58.0
3. Jim Richmond	21:37.2
4. Bob Randolph	20:27.2
5. Wayne Zink	18:57.4
6. Bucky Servaites	18:04.8
7. Charlie Sotich	17:33.0
8. Ron Ganser	15:00.0
9. Joseph Sova	12:45.2

### Indoor HLG

Junior	
1. Gerry Geraghty	109.8
2. Brian Pardue	99.2
3. Robert Hayes	97.8
4. Gregory Simon	95.4
5. William Schlarb	84.0
6. Ricky Myers	81.8
7. John Comerford	80.2
8. Keith Gordy	79.0
9. Bryan Baetens	77.6
10. Larry McFarland	74.8

### Senior

1. Marty Thompson	127.2
2. Bobby Dunham	124.4
3. George Pharr IV	115.8
4. Peter Lewis	105.4
Lee Cleveland	105.4
5. Ronny Ganser	105.0
6. Charles Weise	93.0
7. William Shailor	91.0
8. Danry Bartley	90.2
9. Bobby Hanford	89.6

### Open

1. Rudy Kluber	124.2
2. Bucky Servaites	121.2
3. Vic Cunnyngnam	119.6
4. Terry Kuehne	116.6
5. Bob Hanford	114.4
6. Donald Wright	114.0
7. Dan Belieff	111.6
8. Don Chancey	111.0
9. Robert Watson	109.6
10. Dick Mathis	107.0

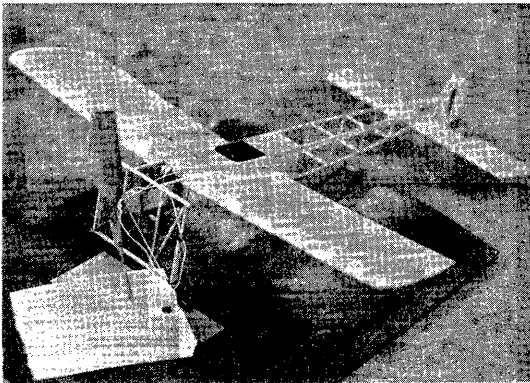
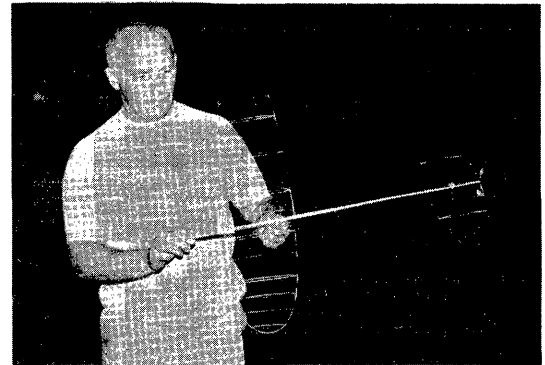
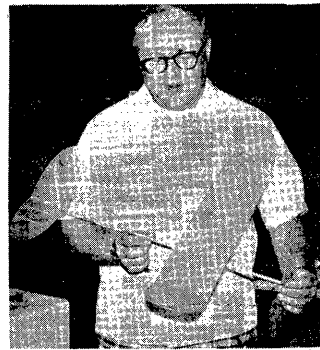
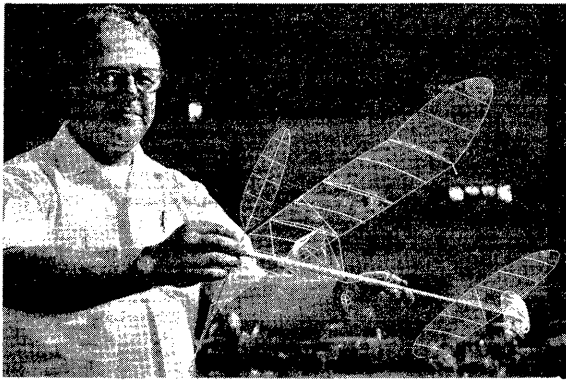
each event this year, which bears testimony that his new job in North Carolina is keeping him busy. Perhaps airline transportation rather than neglect was the problem, but Jim found the need for model repairs the hard way - in flight. He used up two Stick flights making official test flights on his new one gram model before winning Stick with the old standby FAI model. The "flying cardtable" (my name for it - Jim only smiles) one gram model shows very good Cat. II potential and looks like the more famous Richmond FAI in flight - if you ignore the wide wing.

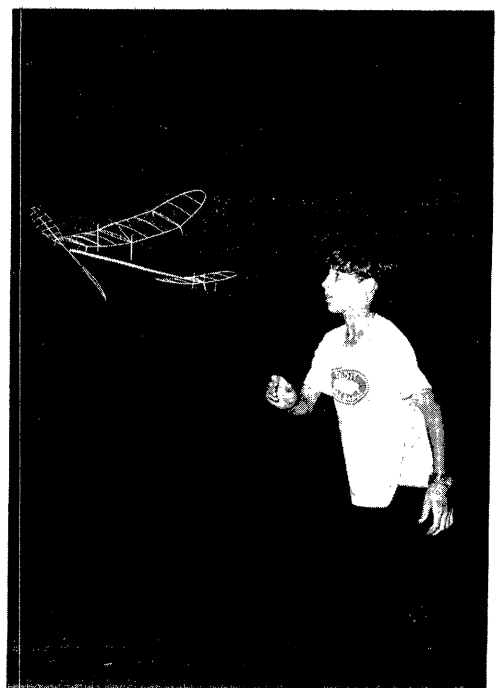
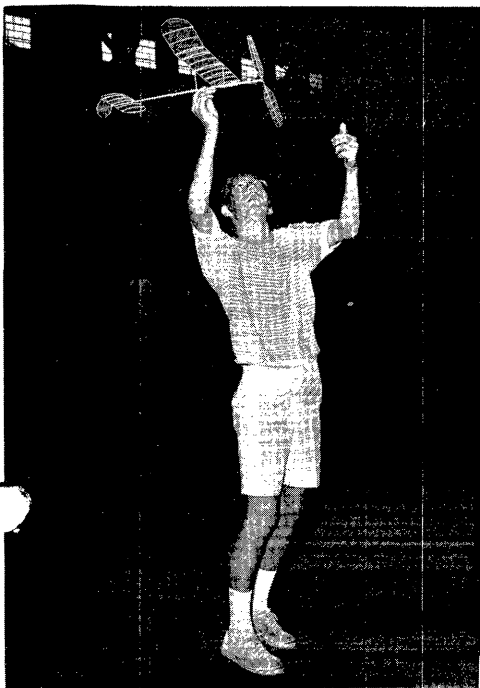
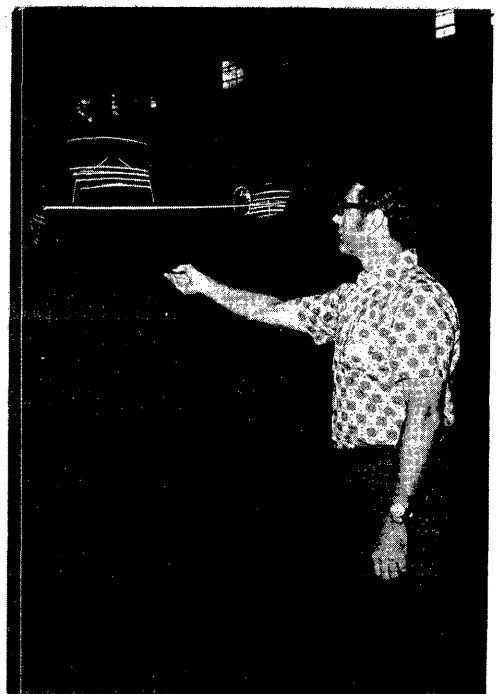
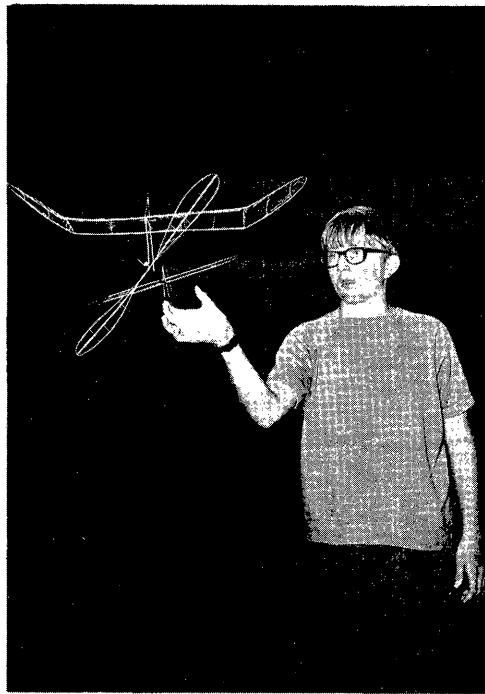
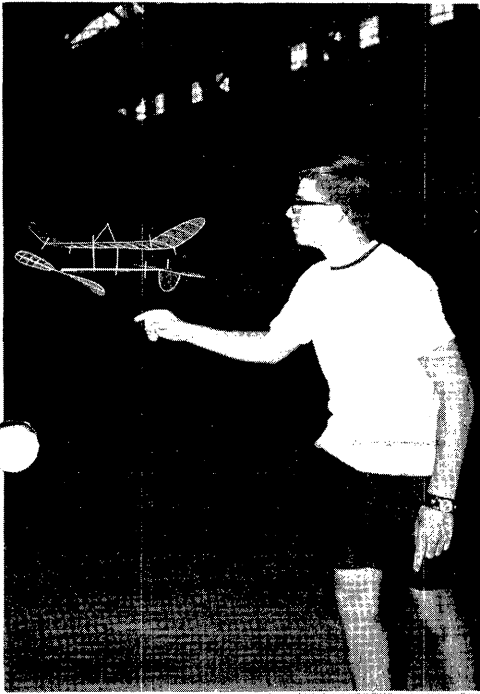
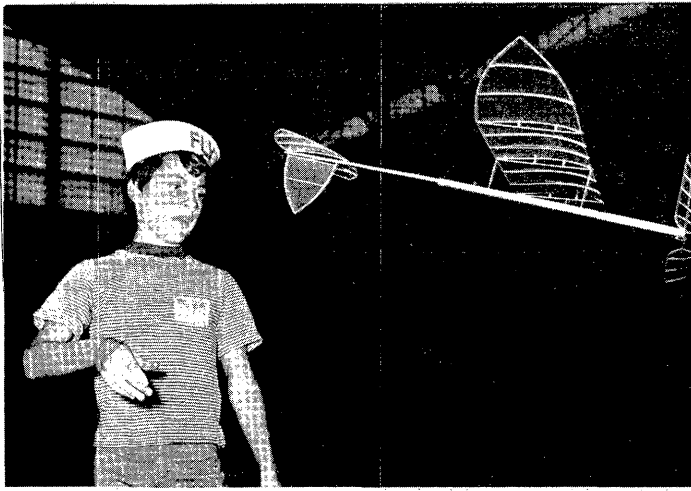
New records were the order of the day in Cabin, but the simple announcement of Ron Plotzke's record in the RECORDS? MAYBE! column fails to tell the story. At the beginning, Jim Richmond's '70 Nats flight of 20:25.2 was still standing. About 2 pm, Bob Randolph nudged this up to 20:27.2. Jim abandoned his planned 4:50 pm flight home and did 21:37.2. This still stood when he left, but Ron Plotzke soon logged 21:55, only to be squeezed out by Al Rohrbaugh's 7 pm flight of 21:58. Ron looked at the score and wandered off muttering something about "have to get it out again". His response was decisive - 23:03.6. Al had already left for home, but he (along with Randolph, Richmond and Plotzke) will get a record certificate to show that he did set the record.

In closing, it is important to mention the superb Navy crew work during both long, long days (12 hour sessions, not counting travel to and from Glenview NAS), and willing and capable assistance from Major Persons who was in charge of the Armory. Also, Jim Perdue served well and faithfully as second in command; Lee Cleveland and George Pickel "kept the books" during HLG, so that the results were mostly up to date as the event closed out.

Indoor Scale was ably and calmly run by Ralph Keunz, George Pharr and other members of the Cloudbusters club. Scale entry was lower than last year, but there really were more entries than appear in the results below. All Nats scores are figured only through fifth place, and I simply ran out of time before getting Scale results pulled below fifth.

(cont. on p. 4)





PennyPlane entry was increased by about 50% this year, and performance took a real jump. In fact, 7th place this year would have won it last year! Considering that the "no touch" rule was in effect, one could envision PennyPlane almost challenging Paper Stick, except that a 6" x 18" wing might be more than 100 sq. in. area and not eligible for Paper Stick. It was reported that one PennyPlane did over 13 minutes, but it touched at least once.

<u>PennyPlane</u>		<u>Indoor Scale</u>	
<u>Junior</u>		<u>Junior</u>	
1. Scott Wisniewski	6:09.0	1. Gregory Simon	121.5
2. Bryan Baetens	5:33.0	2. Scott Wisniewski	93.0
3. Tim Noonan	5:32.0	3. Barry Paillet	92.0
4. Chris Clemens	4:13.0	4. Bruce Paillet	88.0
5. Gregory Simon	4:13.0	5. Patrick Wood	80.0
6. Fritz Curth	2:56.0		
7. Jenny Linstrum	0:37.0		
8. Mindy Linstrum	0:05.0		
<u>Open</u>		<u>Senior</u>	
1. Dennis Jaecks	11:21.0	1. Mark Kummerow	138.5
2. Dick Hardcastle	10:09.0	2. Brian Webster	119.0
3. Larry Cailliau	9:55.0	3. William Shailor	118.5
4. Ron Plotzke	9:47.0	4. Michael Kuehne	118.0
5. Rolland Andreson	9:42.0	5. Paul Tobie	105.0
6. Mathew Turck	9:09.0		
7. Paul Crowley	9:07.0		
8. Hank De Kat	8:40.0		
9. Otto Curth	8:10.0		
10. Charlie Sotich	8:05.0		
11. Don Wright	7:41.0	1. Bucky Servaites	176.375
12. Jordan Wisniewski	7:26.0	2. Charles Markos	159.75
13. Rolfe Gregory	6:55.0	3. Charlie Sotich	159.375
Jim Noonan	6:55.0	4. Frederick Stark	153.0
Paul Shailor	6:53.0	5. Ron Martelet	148.5
15. Ken Kraemer	6:26.0		

#### THE NATS PICTURE STORY

This year's photos are from three sources; U. S. Navy (PH1 John Tharp), Ron Plotzke and Bob Clemens. All the photos on page 3 are official Navy photos, plus the one of Martelet's scale model on page 2. Other photos on page 2 as marked.

#### Page Two

##### Left Column (counting down)

- Bob Randolph poses his Cabin model with retracting gear. Model handles well, and gear retracts under pull from single strand of stretched monofilament. (Clemens)
- Jim Richmond inspects Randolph's V-tail, V-dihedral "D" Stick, while Al Rohrbaugh (background) watches his model in flight. (Clemens)
- Ron Martelet's 1911 Cessna, which won the Bill Hannan craftsmanship award for Peanut Scale. (Clemens)
- Plotzke photo of Plotzke's 1st place Cabin model.

##### Center Column

- Dale Hacker helps Al Rohrbaugh untangle Al's model from balloon string. (Clemens)
- Randolph and his V-tail Paper Stick model. (Plotzke)
- AMA Scale models awaiting judging. (Clemens)
- Al Rohrbaugh prepares to hook up motor to his Paper Stick model. (Plotzke)

##### Right Column

- Andy Tomasch (with model) prepares a flight in Junior Paper Stick. It is Andy's first model (Bandersnap) and his first contest. Andy's father and brother Greg watch in background. (Clemens)
- Ed Stoll and Indoor Stick entry. (Plotzke)
- A. R. Koehler checks over Ron Martelet's controversial Pilatus Porter. (Navy)
- Dennis Jaecks with winning PennyPlane model. 17 1/2" prop on 18" span works well for him! (Plotzke)

#### Page Three (All U. S. Navy Photos)

##### Top Row

Left - Patrick Wood with his Paper Stick model. Pat has flown several Nats before, placed in top 5 in two events this year.

Right - Ron Plotzke patches the wing on his 2nd place Indoor Stick model.

##### Center Row

Left - Jeff Annis with his Paper Stick model.

Center - Bill Shailor, age 15, flies his Indoor Stick in his sixth Nats.

Right - Jim Richmond's "flying cardtable" - one gram, 10" chord FAI with 20" diameter prop. Model showed about 30 minute potential in Cat. II and flew very smoothly.

##### Bottom Row

Left - Robert Dunham II with 3rd place Paper Stick model.

Center - Eric Dyer, age 7, fires away in HLG.

Right - Greg Simon with 2nd place Indoor Stick model.

#### \*\*\*\*NATIONAL INDOOR MODEL AIRPLANE SOCIETY\*\*\*\*

##### New Members!

ROIE R. BLACK, 89 Oak Forest Pk., Blacksburg, Va. 24060  
MARSHALL S. ELLIS, MD, 1612 Anne Dr., Clarksdale, Miss. 38614

ROBERT LEISHMAN, 167 Goldenridge Dr., Levittown, Pa. 19054  
ROGER W. TAYLOR, 3568 Fireway Dr., San Diego, Cal. 92111  
ALLAN B. VOLLMER, 1608 South Ave., Stratford, Ct. 06497

##### Change Of Address

Dave Linstrum has moved again; his new address is 5840 Danforth Ct., Hanover Park, Ill. 60103. New phone number: 312-837-2295.

##### Corrections!

The July RECORDS? MAYBE! column contained at least two errors. First, Tom Sova was listed as setting Junior records - Tom is a Senior this year. Second, at least three readers wrote to point out that Plotzke's 41:10 is not a new high time for Lakehurst. Plotzke did 42:53 with a "300" at the '69 Nats, and Richmond did 41:45 at the '69 FAI Finals at Lakehurst. So much for a muddled memory!

##### New Publications

From a correspondence standpoint, John Malkin has been a slacker. One reason: "Airfoil Sections"; a compilation of useful airfoil sections for all model types. The book contains over 300 sections, plus a well-stated dissertation on airfoil plotting. The book is available in the U. S. for \$1.80, and agents will be given a special price on orders for 50 or more. John's address is 51 Clyma St., Upper Hutt, New Zealand.

#### FAI INDOOR REPORT

##### Program Questionnaire Results

Twenty-five questionnaires of the thirty-six sent to FAI Finalists (and '70 Team members) were returned and gave the following results:

- A unified Finals site should be used.
- The Finals site should be similar to the WCh site expected to be used.
- Questions 1 & 2 served to confirm that a single hangar site (WCh is expected to be in Cardington) will be used; the choice was Santa Ana by 14-10 margin. (One Finalist voted for both sites.)

As a result of the questionnaire results, Declaration of Intent forms were sent to all Finalists, specifying Santa Ana as a site on the expected date of Sept. 25-26, 1971. Return of these forms will enable alternates to be notified if primary Finalists resign.

##### Finals Site Confirmed

The expected date of Sept. 25-26, 1971 has been confirmed since the Declaration forms were sent out. Efforts to provide extra test flying at the site yielded permission for test flying from 4 pm to 10 pm on Sept. 24, in addition to test flying early on Sept. 25. Tentative planning suggests that two rounds will be flown on Sept. 25, and four on Sept. 26. Special plans for housing are being worked on, and plans are being made for a banquet Sept. 26 after flying ceases. Additionally, it is likely that a bull session get-together can be held Sept. 25.

##### Special Mailing!

It is quite possible that fliers other than Finalists will desire to attend the Finals to help and/or watch. All who would appreciate advance information on arrangements and possibilities should drop a line to Bud Tenny, Box 545, Richardson, Texas 75080. Those who make such requests will be included in any special mailings to the Finalists; the mailings will detail final arrangements as they are formulated.

##### RECORDS? MAYBE!

1971 Indoor Nats, Chicago, Ill.; July 26-27, 1971 Cat. II  
Brig. Gen. Richard L. Jones Armory - 90' ceiling  
Junior HLG - 1:49.8, Gerry Geraghty  
Senior HLG - 2:07.2, Marty Thompson  
Senior Indoor Stick - 24:19.0, Ronny Ganser  
Senior Paper Stick - 17:10.4, Tom Sova  
Junior Indoor Cabin - 11:41.3, Gregory Simon  
Senior Indoor Cabin - 15:23.0, Ronny Ganser  
Open Indoor Cabin - 23:03.6, Ron Plotzke



# INDOOR

## NEWS and VIEWS

Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

### A TIME FOR REFLECTION

We are finishing the most turbulent FAI Team Selection Program in history. It is now time to consider matters which will affect AMA's participation in future World Championships, and even whether effective participation is possible. Precedents established in this program raise serious doubts whether anyone would agree to be Chairman until several matters of authority are settled. It has been clearly demonstrated that an appointed Chairman has no real authority over his program, regardless of official policy established by the Executive Council.

These policies were announced in the Oct. '64 Model Aviation, and have been updated in recent years. In stark contrast, there appears to be no public record of any FAI Executive Committee before 1967, when such a Committee with only advisory powers was created.

During the 1971 Indoor Program, a group calling itself the FAI Executive Committee and claiming to have been established in 1964 committed some almost incomprehensible actions which greatly disrupted the Program continuity.

There could be little complaint if actions of the FAI Executive Committee had been consistent with past policy, or had followed established guidelines. However, this group blundered twice so badly that their motives and collective common sense must be questioned. In July, rather than following their own policy which required a poll of Finalists, they decreed that the Finals would be split into three sections including a flyoff at the Nats. Since the Nats were then only 12 days away, the entire Program collapsed almost immediately. The Committee then backed down and allowed the questionnaire to be sent; they stipulated the content and format of this questionnaire and approved the final wording before releasing it. When this

questionnaire failed to satisfy a small minority, a second questionnaire was circulated. The second poll allowed choices of Finals dates which were only 16 days removed from the receipt of final results! At this point, the AMA President decided the arrangements announced below.

By virtue of the Committee's ready access to AMA HQ, and their total lack of accountability, FAI Programs are whatever the whim of the Committee dictates them to be. Thus, a Chairman is superfluous, and it is unlikely that anyone would undertake the job.

From the standpoint of future program participants, it would seem foolhardy to invest time and money in a program which can be changed on a whim, with little or no notice. With neither Chairman nor participants, future programs cannot exist.

All those who are interested in FAI Indoor Programs should write or call their District VP (see listing in Model Aviation) requesting the following actions:

1. Publication of all AMA policy regarding FAI Programs.
2. Publication of the duties and full definition of the authority of Program Chairmen.
3. Clarification of the status and authority of any FAI Executive Committee and any other group having authority over FAI Programs.
4. Change the make-up of the Committee from all-eastern R/C fliers to include membership of R/C, U/C and FF or Indoor fliers, plus membership for Program Chairmen during their tenure.

### \*\*\*\*NATIONAL INDOOR MODEL AIRPLANE SOCIETY\*\*\*\*

#### An Apology

This issue is late and abbreviated (again!), and from the looks of my briefcase, I owe the whole world a letter. It simply is not possible to wrap up a Team Selection Program twice in little over a month, plus organize another Finals with less than 15 days notice, and do much else. Future issues may be late, but I can guarantee the same reasons will not be the cause! The time is past when I will volunteer to chair the program; without considerable reform I shall not participate in future programs at all. The assorted stupidities which passed for official action during the latter part of the '71 program must never be allowed again, or the U. S. will never have an effective team selection program.

#### A Problem Solved

Several issues ago, a plea was made for someone to make available good spacers for the Bilgri-type strippers built by Bob Dunham. Ted Gonzoph has suggested that lead spacers used by print shops are a good solution. These are lead slabs cut flat, and come in sizes called "points" at about .015" per point. With 1,2,3,4,6 & 8 point sizes available, quite a range of accurate and repeatable cuts can be made. Ted has reported his method in detail, and this will be presented as soon as it can be worked up.

#### Covering Brush

Stephen Fauble has found that artist's pin striping brushes are superior for Bilgri style covering. The fine point is easily controlled, but the brush holds an extra amount of water. These brushes are scarce, but Steve has located a source and can furnish them for \$1.50 each. If you're interested, drop him a line at 741 N. Jefferson Ave., Dixon, Ill. 61021.

#### NFFS Symposium Report

Each year, inspection of the Symposium Report of the NFFS reveals a dedication to the Free Flight cause which is wide in scope and thorough in application. This is also true of the Fourth Annual Report, which is now available from Annie Gieskieng, 1333 S. Franklin St., Denver,

Colo. 80210 for \$3.50 if you are a member of both AMA and NFFS; for others the cost is \$4.50. This book is a must for all serious FF fliers!

#### FAI INDOOR REPORT

##### Team Selection Finals

Much has happened since the Sept. issue came out. On Aug. 28, the FAI Executive Committee issued another poll to Finalists, stating that the July poll had not been decisive. By Sept. 9, the new poll results were in, but again were not conclusive. To save the Program from further delay, the AMA President declared the following:

1. The Finals will be held jointly at Santa Ana and Lakehurst on Sept. 25-26, 1971.
2. Finalists may fly at either meet but not both.
3. Finalists (listed below) only and '70 Team members are eligible; no alternates will be qualified.
4. Team membership shall be the winning flier at each site, plus that flier whose score is the highest percentage of the winning time at that site.

Because of the radical departure from established procedures, President John Clemens also declared that these actions were not to be considered precedents.

CD's for the Finals:

Santa Ana	Lakehurst
Gene Bach	Bill Bigge
6612 Barnhurst Dr.	5131 Mass. Ave. NW
San Diego, Cal. 92117	Washington, D. C. 20005
714-278-3779	301-229-8696

#### Listing of Finalists

The following list represents the only fliers to be eligible to enter the Finals:

Romak	Rodemsky	Cailliau
Gibbs	Bob Randolph	Mather
Allen	Linda Randolph	Rambo



Bilgri	Tryon	Ganslen
Dunham	Dunham II	English
Champine	Cannizzo	Russo
Platt	Crane	Ganser
Radoff	Triolo	Vallee
Hulbert	Kowalski	Stoll
Plotzke	Cowley	Gonzoph
Batiuk, Jr.	Blubaugh	Chilton
Collins	Andrews	Richmond

RECORDS? MAYBE!

SANTA ANA RECORD TRIALS, Aug. 28-29, 1971, Cat. III  
 Santa Ana MCAS  
 Senior HL Stick - 28:31.8, Bill Gibbs  
 Senior AMA Cat. III FAI - 28:31.8, Bill Gibbs  
 Open FAI Cat. IV FAI - 35:42, Bud Romak  
 Open AMA Cat. III FAI - 35:42, Bud Romak

STATE OF THE ART

The following remarks by Clarence Mather were promised as a supplement to the plan of Kalina's salt mine model in the July '71 issue. I asked Clarence to analyze the model (he traded with Jiri after the '70 WCh) and here is his response.

Kalina presents himself as a beginner in micro-models, and his experience dates back only a few years. He gives the U. S. teams credit for his knowledge, and he obviously has learned well. (Ed. note: Jiri's 4th place at Debrecen in 1966 showed such good promise that one might think Jiri is quite modest.)

The model I have is one of Jiri's salt mine specials, but it is very similar to his warm air models and has the same shape and dimensions as were revealed in the Dec. '68 issue of INAV. The basic design features (short stick and boom, large stab and rear fin) give the look of Bilgri designs - which are far from extinct and compete well.

Jiri's workmanship is of high order. Surface outlines are graceful curves and the wood is evenly cut. No excess glue is visible on the straight motor tube and boom, and the seams are almost invisible. The metallic blue wing film and gold to silver tail film is slack, but not floppy. Weight is .020 oz., but the model is fairly rigid. All wood is clear white and apparently high quality.

I must digress a bit. One reason given for one gram models was scarcity of indoor wood in Europe; which seemed to be belied by the many light and strong European models. Such good wood is obtained by searching through outdoor wood stocks for quality wood; it is then sanded to indoor sizes! Consequently, it takes many hours to get the wood to a usable thickness. Also, some wood was donated by Bud Romak, Joe Bilgri, Lew Gitlow and possibly others.

The model is balanced at 50% with the large salt mine "gumma" (rubber). Because of the short coupling, the stab carries a larger load than might be expected. Even so, Richmond's models load the stab even more than does this model.

The airfoils are thin - 3/16" for a 5.8" chord, with high point at about 40%. The 5.3" center stab rib has only 1/8" camber. In flight the film billows up a little to give a slightly thicker section. Jiri's warm air models have about 1/32" thicker airfoils than this model.

The left wing is half an inch longer than the right, with .4" washin; more than on the warm air models. This holds the model in a tight climbing turn under the power burst; no fin offset is necessary. The tips are unbraced, and the center panel has double bracing. At Rome ('68 WCh), Jiri used picket fence bracing, but not for the mine. Several thin balsa posts are placed between the wire and trailing edge to stiffen the spars.

Stab tilt is about 1", with no wire bracing and the stab has 0° incidence relative to the motor stick. The only bracing is small wood pieces to the boom from both leading and trailing edges. The stab has 1/8" washin, but this may be warps due to age.

The 1/4" diameter motor stick has a single wire brace supported by a center post and the wing sockets, which appear to be formed of thin wood. The double thrust bearing has some downthrust and left thrust; the stick brace wire wraps around the front of the bearing.

The 17 x 31.5 prop has symmetrical outlines with just over 1 1/2" width; the airfoil has 1/16" camber. The small spar is not overly flexible, indicating strong wood. Jiri uses this prop design only in the cold air of the salt mine. Under high torque the blades appear to flare to lower pitch, giving a rapid climb - 180' in about six minutes. The prop then reverts to normal pitch for slow RPM cruise and descent.

Due to drafty conditions, I have flown the model only a few times under low power. Extra wing incidence was needed, probably due to the stick brace wire lengthening in warm air. When Jiri flies the model, it climbs at a shallow angle, moving fairly fast. After one or two circles the climb angle seems to increase. Here, I'll speculate a bit. With the forward balance point the model needs considerable incidence, which should produce a down tendency. The downthrust helps to control this, I believe Jiri adjusts the stick brace wire to allow some bending under full power. At any rate, the model climbs rapidly and smoothly, yet retains a slow cruise and descent. Low model weight helps, and Jiri uses motors with weight 1.2 to 1.5 times the model weight to give a low total weight.

EUROPEAN CONTESTS

POLAND

Indoor contest at Halaludowa (site) in Wroclaw, May '71

1. Stefan Bombol	48:19
2. Edward Ciapala	47:48
3. Jreneusz Pucelko	45:15
4. Stan Zurad	40:36
5. Jerzy Kaczorek	37:31

ROMANIA

"Indoor 71", international meet at Slanic-Prahova, May 9-11, 1971, (salt mine), 65 cm. span, no weight limit.

1. J. Kalina	Czech	36:52	35:32	72:24
2. K. Rybecky	Czech	32:24	33:57	66:21
3. O. Hinta	Romania	33:50	31:58	65:48
4. A. Ree	Hungary	31:14	31:06	62:20
5. E. Chlubny	Czech	29:41	30:25	60:06
6. E. Holtier	Romania	28:29	30:51	59:20
7. A. Moraru	Romania	30:05	28:53	58:58
8. Z. Ocsody	Hungary	30:11	28:41	58:52
9. G. Buzady	Hungary	28:35	28:07	56:42
10. A. Egri	Hungary	28:19	27:15	55:34

Team Standings:	1. Czechoslovakia	198:51
	2. Romania #1	180:04
	3. Hungary	174:36
	4. Romania #2	154:01

It should be noted that the Hungarian team was 3 one gram models, and that their team total and Andras Ree's total exceed their totals from the '70 WCh!

HUNGARY

Hungarian indoor meet, Politechnical University in Budapest, 14.9 m site, one gram models.

1. Z. Ocsody	22:40	25:19	47:59
2. A. Egri	22:44	22:46	45:30
3. R. Kreisz	20:14	21:13	41:27
4. G. Buzady	22:45	18:19	41:04
5. G. Varszegi	18:29	18:47	37:16

Budapest Championship, Politechnical University in Budapest, 14.9 m site, one gram models.

1. A. Ree	29:50	25:37	55:27
2. R. Kreisz	21:32	22:07	43:39
3. A. Egri	22:02	20:15	42:19
4. G. Varszegi	18:41	17:03	35:44

CZECHOSLOVAKIA

International Indoor Meet, Trade Hall in Brno, July 10-11, 1971. No word on rules, presumably 65 cm, no weight limit.

1. J. Kalina	Czech	34:11	33:14	67:25
2. E. Chlubny	Czech	29:37	29:07	58:44
3. J. Jirasky	Czech	29:17	28:50	58:07
4. R. Cerny	Czech	27:06	28:45	55:51
5. D. Chlubna	Czech	28:15	27:06	55:21
6. T. Weigert	Czech	27:00	26:12	53:12
7. R. Czechowski	Czech	24:00	26:00	50:00
8. K. Rybecky	Czech	22:16	26:45	49:01
9. G. Buzady	Hungary	23:22	22:13	45:35
10. L. Koutny	Czech	25:49	19:35	45:24

BASIC ADJUSTMENT TECHNIQUES FOR LOW CEILING GLIDERS

by Norm Ingersoll

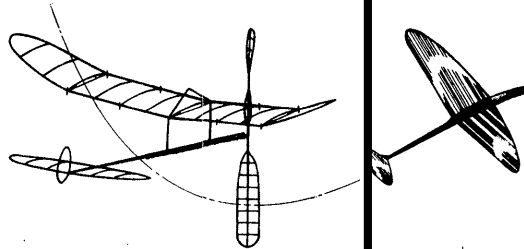
(Ed. Note: The following has been reprinted from the Feb. '62 issue of Chuck Borneman's newsletter, published by the Kokomo Knights of the Round Circle.)

It is assumed that you are flying a model of the correct size and weight for your particular site. The most important single factor that will be stressed will be the direction of your adjustments. There are many trims possible with a particular glider which will produce pleasing



# INDOOR

## NEWS and VIEWS



Editor: Bud Tenny · Box 545 · Richardson, Texas · 75080

### SANTA ANA FINALS

1. Joe Bilgri	30:38	31:22	17:00	34:18	30:55	34:20	68:38
2. Bud Romak	15:07	32:35	21:39	18:30	34:05	34:18	68:23
3. Ron Plotzke	5:55	33:03	8:54	29:44	34:38	7:09	67:41
4. Paul Allen	19:21	27:21	27:16	32:33	12:33	32:36	65:09
5. Bob Randolph	0:02	30:09	7:54	32:33	32:01	31:18	64:34
6. Larry Cailliau	0:05	32:57	14:59	30:45	25:13	27:37	63:42
7. Clarence Mather	29:18	30:47	29:07	14:01	29:33	11:48	60:20
8. Carl Rambo	29:51	27:32	26:45	7:07	29:45	9:55	59:36
9. Bob Gibbs	26:47	24:47	27:53	13:15	31:19	27:40	59:22
10. Erwin Rodemsky	30:04	6:13	28:11	16:02	12:25	6:50	58:15
11. Ted Gonzoph	28:43	0	0:06	15:41	25:00	0	53:43

### LAKEHURST FINALS

1. Pete Andrews	24:38	33:05	1:20	0	27:43	20:17	60:46
2. Sal Cannizzo	22:37	9:23	2:08	21:17	27:55	20:09	60:32
3. Ed Stoll	25:34	33:51	1:44	18:29	0:15	10:55	59:25
4. Bob Platt	31:33	9:22	2	14:30	22:17	27:30	59:04
5. Dick Kowalski	24:35	27:54	2:01	0	20:59	7:14	57:29
6. John Triolo	0:48	28:25		11:33	22:18	26:11	54:36
7. C. V. Russo	24:23	14:34	1:55	0	25:54	0:11	50:17
8. Jim Richmond	24:19	0:18	2:22	21:43	0:20	0:13	47:27
9. Bill Hulbert	0	24:04	1:11	13:31	21:39	5:39	45:41
10. Tom Vallee	20:16	18:52	1:18	0	0	0	38:06
11. Bob Cowley	0	11:46	1:44	0	0	0	23:30
12. Manny Radoff	15:31	0		9	0	0	16:40

### FAI INDOOR REPORT

#### Qualifier Decals Available

This year, as in recent years past, the National Free Flight Society has furnished special decals for qualifiers in the indoor program. Three levels of decals are available—Qualifier, Semi-Finalist and Team. Those who were eligible to enter a Semi-Finals get Qualifier decals, and those who made it through the Semi-Finals get both Q and S decals. Team members get all three types of decals.

These decals will be sent out - eventually. If you want them sooner, send me a self-addressed envelope and I'll gladly send the decals sooner.

#### 1972 Team Chosen

The results above, separated into two Finals, do not tell the whole story. According to John Clemens' decision, the winner of each Finals would win a Team berth, along with the flier whose time was the highest percentage of the winning time at his site. The computation is:

Bilgri	68:38	Andrews	60:48
Romak	68:23	Cannizzo	60:32
68:23/68:38 = .9963		60:32/60:48 = .9956	

Thus, the 1972 Team will consist of Bilgri, Romak and Andrews, subject to their confirmation on intent to compete in the 1972 World Championship.

### THE SANTA ANA FINALS

The Santa Ana Finals began with test flying from 4 pm until dark on Friday, Sept. 24. Later flying was planned, but no one knew where the light switch was! Erv Rodemsky made the most of what was to prove the best conditions of the meet by posting a 38:21 test flight. So far as is known, this is the longest one gram flight ever made.

Local weather conditions had been good at Santa Ana through Sept. 24, with "highs" of 85° or more. During the meet, this changed to 70° with gusty winds. Small openings in the hangar sides at ground level also contributed to localized turbulence. Overall, the drift patterns were unstable and unpredictable and several models were lost on Saturday during the scheduled two rounds. Bilgri led the field with 62:00, followed by Mather (60:05) and Rambo (57:13). Ron Plotzke's 33:03 was the best single flight.

Conditions improved Sunday, but drift was still very unpredictable. Ron Plotzke again had high time of the day with a model similar to Rodemsky's, but another strong flight missed by settling onto a beam leaving him 57 seconds short of winning. At the end of Round 3, Rodemsky moved into third place, but no one else made significant gains. Bilgri's Round 4 flight advanced his score nearly

four minutes to a seemingly commanding lead over Cailliau and Plotzke.

Round 5 began the final shake-out, with Plotzke and Romak moving into 1st and 2nd. Randolph upped his total by two minutes and still dropped from 4th to 5th, and Mather deadsticked into 6th for his 5th place.

Long-standing advice to indoor fliers is "Don't count Joe out until he puts his model away." This held true in Round 6 - Joe duplicated his previous high time to come back to first place. Romak's close association with Joe seems to have given him the same trait - he also came up with another high time for a close second that was a real cliff-hanger. Fairly close to the floor, and only seconds behind Joe's total, Bud's model dropped one end of the motor and stalled to the floor 15 seconds short of a tie. This nosed out Plotzke at the last minute, in a photo-finish that excited everyone.

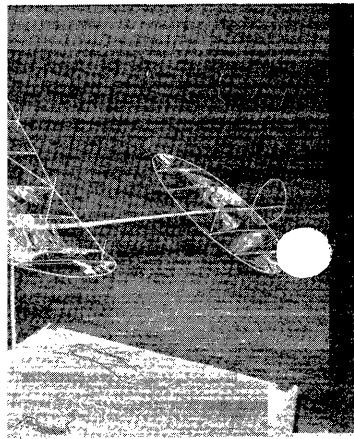
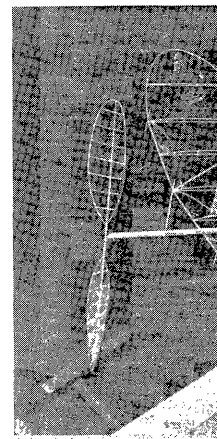
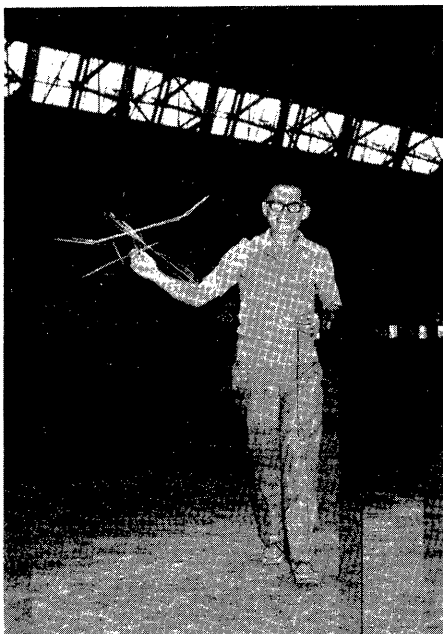
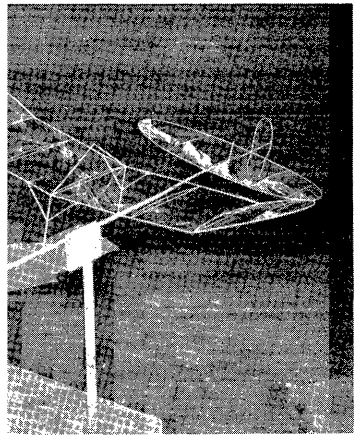
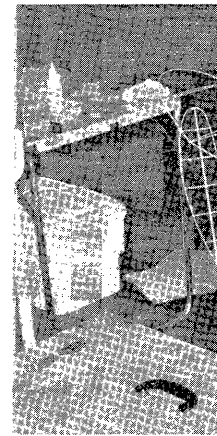
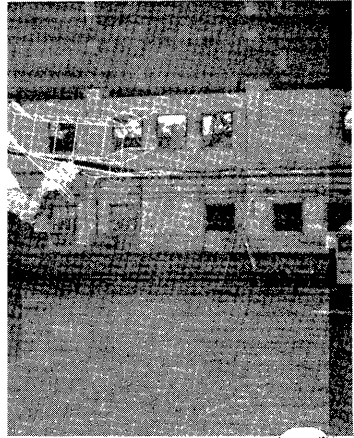
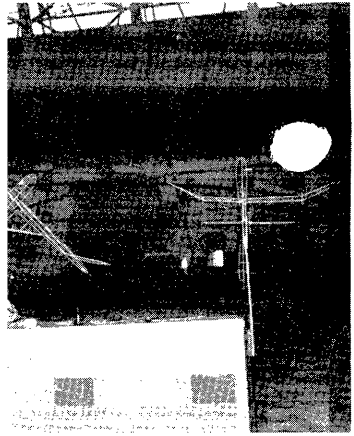
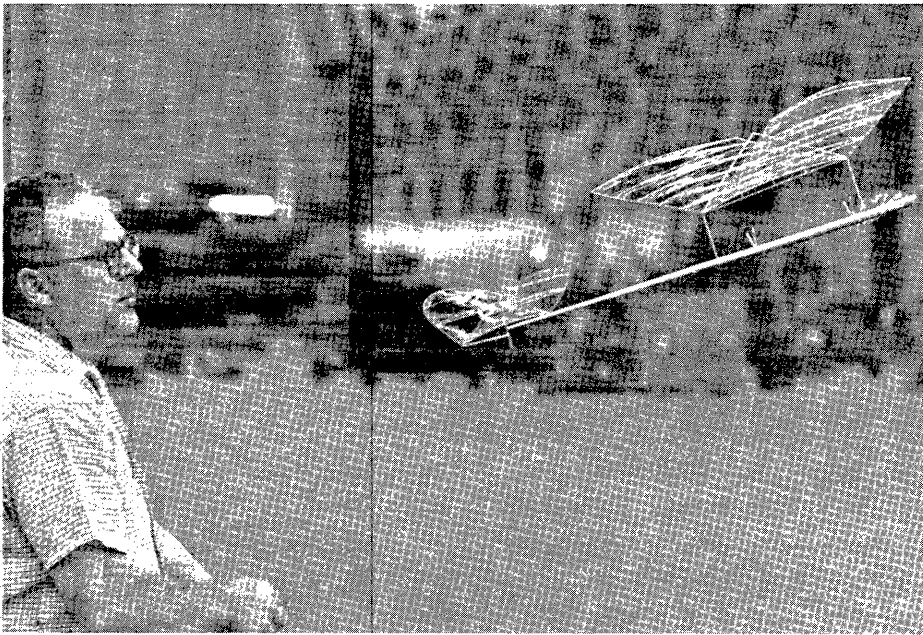
Gene Bach of the San Diego Orbiters CD'ed the meet, with able assistance from other Orbiters and members of the Thermal Thumbers. One other helper of note added an international flavor - the Sunday session was visited by Gordon Burford of Australia who "happened" to be passing by. Gordon was one of the indoor pioneers in Australia, and has been instrumental in helping indoor flying off to a recent revival there.

### THE LAKEHURST FINALS

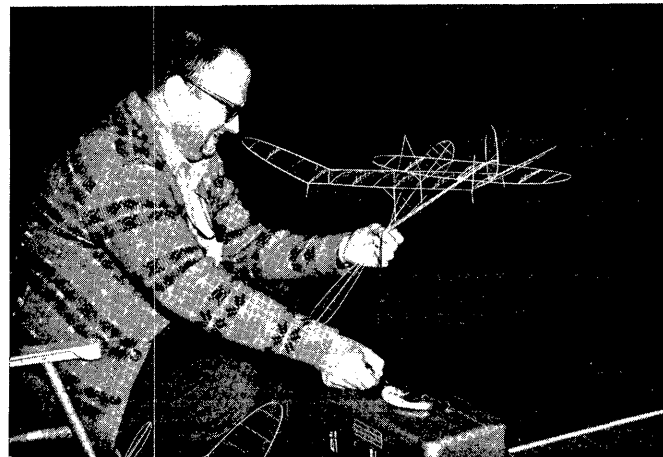
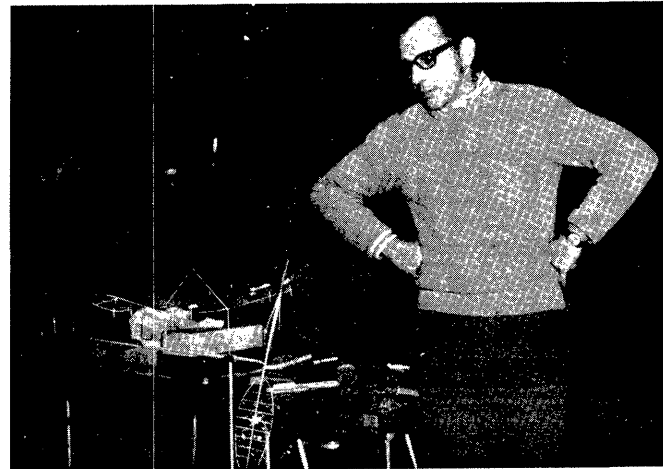
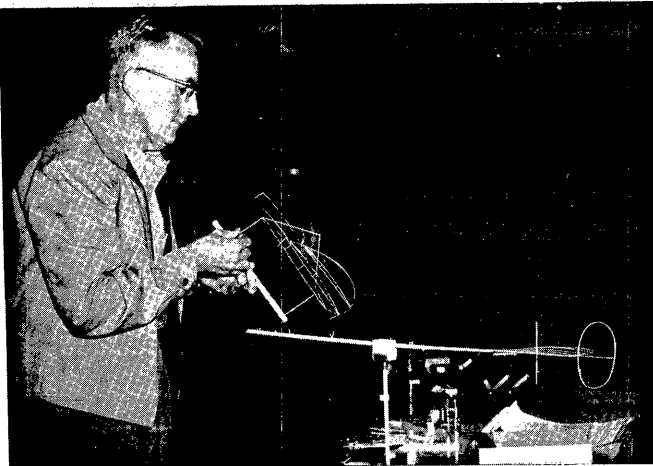
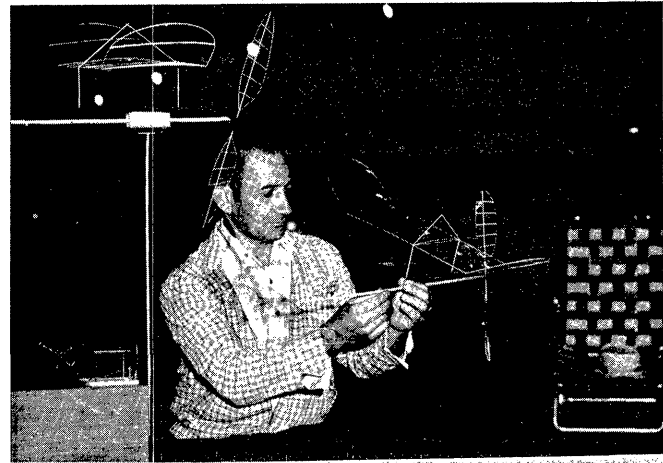
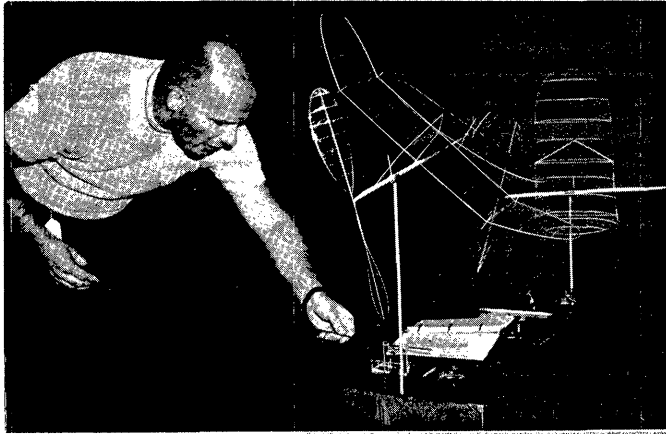
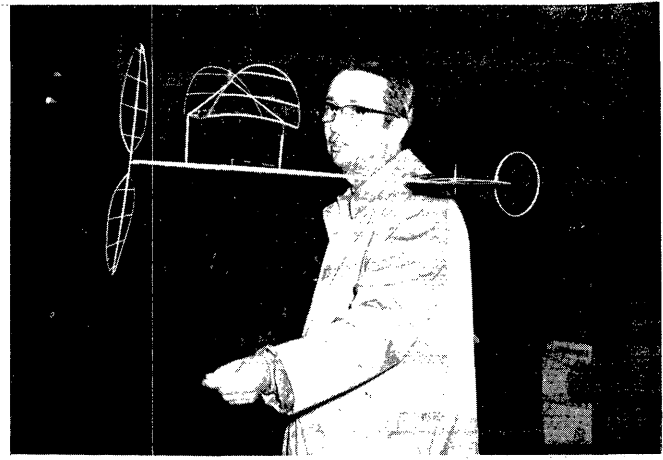
The Lakehurst session had weather problems compounded by unscheduled door openings. At least two fliers made comparison between the existing conditions and the salt mine conditions of the '70 WCH. In fact, with drizzling rain outside and lights along the walls, a similar down-draft in the center of the hangar gave credence to the comparison. The original schedule called for three rounds each day, but a 5:30 pm door closing on Saturday cancelled the third round until Sunday.

An analysis of the action shows that really only six fliers were ever in contention either day. At the end of Round 2, Ed Stoll was leading, and led until Round 5. The other Round 2 placings were (in order) Andrews, Kowalski, Cannizzo and Platt. In Round 3, Cannizzo moved into 2nd and remained there the rest of the day, and Richmond made 5th place. This order (Stoll, Cannizzo, Andrews, Kowalski, Richmond) held until Round 5 when Platt made it back to 5th and Andrews and Cannizzo both posted new times to reach 1st and 2nd. The only change in Round 6 was that Platt pushed into 4th, very close to the top three. In view of the conditions, it is safe to say that any of the top five could have wound up on top. This is not to take anything from Andrews, who had top equipment and flew "to the hilt" every flight and whose consistency was as good as anyone's.

(CONT. P. 4)







Jim Richmond's past record compared with the results at this meet raises the question of "What happened?" Jim analyzed it this way: "It was a combination of underdeveloped plane design, lack of testing, poor flying conditions and terrible luck."

Jim didn't lose from lack of trying. He had two 9" chord models, a 10" chord model (see Aug. '71 INAV for picture), the '71 Nats winner ballasted to one gram and his paper ship. Structural problems in the turbulence was a problem with the wide models, but the terrible luck came in Round 4 as he lost a rear hook (first ever) and then the model; followed in Round 5 by a broken motor which destroyed the Nats winning model.

Kowalski and Stoll flew models similar to Dick's Cat. II record holder (June '71 INAV), but with enlarged props (diameter and blade area). In fact, big props seem to be part of the answer for one gram models; Andrews flew small props until Round 5 when he found a 20" x 30" prop climbed the model better. Cannizzo's models were well constructed but entirely conventional with the usual thin airfoils usually deemed necessary. In contrast, Andrews used a 7% airfoil like Kowalski's.

Eastern fliers owe special thanks to Bill Bigge, who agreed to CD the Eastern Finals with about 15 days notice, and to John and Patti Jo Thornhill for their help. Many others helped to time, but we have not received word on who these were. Nonetheless, our thanks to them also!

\*\*\*\*NATIONAL INDCOR MODEL AIRPLANE SOCIETY\*\*\*\*

New Members:

ARTHUR BLAKE, 612 Sutton Dr., San Antonio, Tex. 76228

Family Memberships

EDWARD R. & ROBERT M. BLAKE, 612 Sutton Dr., San Antonio, Texas 76228

Combined Issue

This combined issue is a last resort to try to catch up to a more normal and useful production schedule. Once we got behind, things snowballed until something had to give. In recent weeks, an unexpected trip and an abscessed tooth added to the problems. So, it is hoped that the December issue will be back on schedule (approx. 10th of the month), with your deadline for material to make any particular issue to be the 5th of that month. The annual financial report will be in the December issue.

INAV Columns

Indoor News has a number of columns which depend upon the readers to furnish the contents. These columns are:

RECORDS? MAYBE! - This is a listing of records which have been applied for. Fliers (or CD's) who make application for AMA indoor records should send INAV the info about the record. Official AMA Records are listed periodically in COMPETITION NEWSLETTER, but INAV can offer an unofficial listing which helps us keep up with the records as they happen.

TOP TEN EASY B and TOP TEN CEILING DODGERS - These are monthly listings of a friendly rivalry between NIMAS members. Times are submitted along with ceiling heights of the site where the flight was made. NIMAS "Fudge Factors" are applied to equate the times to a 35' ceiling, and the times are then ranked according to the adjusted times. The EASY B listing begins anew each year with the winners from the NIMAS Annual Postal Contest, but the CEILING DODGERS listing runs continuously. Fliers submit times and "bump" their way onto the list or up the line in ratings as their times improve. Rules for TOP TEN events:

1. Flights must conform to AMA regulations, except that FAI type ceiling measure can be used.
2. Submit ceiling height with flight times.
3. No entry fee required, open to all fliers.
4. Easy B models shall conform to AMA Rules, plus paper covering, solid stick and boom, no bracing.
5. CEILING DODGER models can be any AMA indoor model. Object is to record the highest time without touching the ceiling. Estimate maximum altitude achieved and submit this with flight time and ceiling height.

POSTAL CONTESTS - Postal contests are arranged between clubs or individuals with pre-arranged events and rules. Contest results reported to INAV. Groups who wish to issue a challenge can do so in INAV or arrange event on their own.

NIMAS AWARDS - A system of awards for flights which may not exceed existing AMA Records, but exceed established goals for specified awards according to the following tables:

Indoor Stick (Any class indoor model, single flight)

OPEN 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

JR. AWARD

Silver	7:30	15:00	21:00
Gold	9:30	18:45	26:50
Diamond	11:15	22:30	31:30

Indoor HLG (Best single flight of nine)

OPEN 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

JR. AWARD

Silver	0:18	0:34	0:41
Gold	0:22.5	0:41	0:49
Diamond	0:27	0:49	0:56

NIMAS Awards are made to NIMAS members who request the awards and submit the application. In general, the flights must meet AMA Rules. Award flights can be made under the supervision of an AMA CD or can be regular flights in an AMA contest. Application can be made for flights made in the past (for example, '71 Nats flights), or application forms can be obtained in advance of attempts to win the awards.

CONTEST CALENDAR and CONTEST RESULTS - CD's can furnish advance information on planned contests or flying sessions for announcement in CALENDAR, and the meet results will be announced on a space-available basis if furnished.

A LOOK AT YESTERYEAR - This appears on an occasional basis and can be any item reminiscent of Indoor history or model design.

CHANGE OF PACE - This is an occasional item, reporting unusual or experimental models, usually "fun" type models or similar projects.

STATE OF THE ART - This is usually a monthly feature, a report of a record holding model in most cases. Some subjects have been specialized models such as Bob Larsh's "Bunker Hill" and Meredith Chamberlain's "Stompette 16", which were gliders especially for low Cat. II sites of about 45' height. Please give full size outlines on HLG, plus weights and construction information for unusual details. For rubber models, a three-view with dimensions, weights and full size airfoil and prop blade outlines are a minimum. Many readers also request spar sizes if possible.

SPECIAL NOTE: although it is possible for me to use full size plans of rubber models or crude sketches or low contrast pencil drawings, items which have to be traced or re-drawn (worse - full size drawings which have to be scaled down, then traced) take extra preparation time and are sometimes lost in the mail or delayed considerably by the extra preparation time. In other words, the information in any form is welcome, but camera-ready drawings are preferred.

CONTEST CALENDAR

MARYLAND - Silver Spring. Indoor sessions at JFK High School, 1901 Randolph Rd., Silver Spring. Contact John Thornhill, Route 1, Mt. Airy, Md. 21771 for dates and times of sessions.

MASSACHUSETTS - M.I.T. Indoor sessions at MIT Armory, corner of Vassar St. and Mass. Ave, Cambridge, Mass. Nov. 13, Dec. 4, Jan. 8, Feb. 26, March 11, 3 pm to 6 pm. Contest April 8, 1972, 1 pm to 8 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass.. ph. 358-4013.

TOP TEN EASY B

OPEN	Time/Ceiling	Fudge (to 35')	Score
1. Bob Platt	598.6/20'	1.33	786
2. Hal Crane	551.8/20'	1.33	733.
3. Dick Hardcastle	683.6/31'	1.04	726
4. Clarence Mather	521.0/22.3'	1.26	656.4
5. Fudo Takagi	492.0/22.3'	1.26	619.8
6. Fred Harlow	402.0/20'	1.33	534.6

7. Chet Bukowski	428.0/25'	1.19	509.4
8. Richard Sherman	329.0/25'	1.19	391.8
9. Don Chancey	499.5/58'	.78	389.4
10. Jim Clem	495.0/58'	.78	386.0

Top Juniors

1. Danny Aggers	252.5/24'	1.22	307.8
2. Jimmy Clem	386.0/58'	.78	501.2

TOP TEN CEILING DODGERS

	Time/Ceiling	Fudge (to 35')	Est. Altitude	Score
1. Stan Chilton	1115/35'	1.00	33'	1115
2. Tom Vallee	810/20'	1.33	19'	1077.3
3. Hal Crane	682/20'	1.33	19'	907
4. Dick Hardcastle	602/23'	1.23	22.5'	743
5. Hewitt Phillips	528.2/20'	1.33	15'	712.5
6. Howard Haupt	456/22'	1.26	15'	575
7. Harry Cook	471/26'	1.16	24'	546.5
8. Jim Davidson	280/13'	1.64	9'	459
9. Richard Sironen	308/37'	.972	33'	396.6
10. Roger Schroeder	239.5/15'	1.53	13.5'	365.9

THE PICTURE STORY

Page 2 - Santa Ana Finals. Large pix by courtesy of USMC Base Public Relations; small photos by Joan Rodemsky.

First column:

Top - Bob Randolph's wide chord, V-Tail FAI goes off on official flight.

Center - Larry Cailliau repairs one of his models.

Bottom left - Paul Allen prepares to make an official.

Bottom right - Carl Rambo retrieves his model after flight.

Second column:

Top - Joe Bilgri prepares to hook up for flight.

Top center - Clarence Mather and The Bipe.

Bottom center - Ery Rodemsky's model

Bottom - Ron Plotzke's model.

Page 3 - Lakehurst Finals. All pix by Ernie Kopecky.

Top left - Bill Bigge (CD) and Chief Helper - Patti Jo Thornhill.

Top right - Pete Andrews and "windy weather" model flown on Sunday.

Row 2 left - Ed Stoll winding on torquemeter.

Row 2 right - Sal Cannizzo assembles a model.

Row 3 left - Bob Platt unpacking models.

Row 3 right - Dick Kowalski plans strategy.

Bottom left - Richmond with 9" chord model.

Bottom right - Tom Vallee, wound for bear, hooks up.

CONTEST RESULTS

D. C. MAXECUTERS EAST COAST INDOOR CHAMPIONSHIPS - Cole Fieldhouse, Maryland University - 98' ceiling

Indoor Stick		Paper Stick	
C. V. Russo	25:08.0	Joe Sova	18:59.4
John Triolo	24:54.6	Pete Andrews	18:36.2
Tom Sova	24:13.0	Tom Sova	17:47.7
Pete Andrews	24:08.0		
Hal Crane	23:51.5		

Junior Easy B		Sr.-Open Easy B	
Jerry Haynes	5:46.8	Rolf Gregory	11:36.2
John Roman	4:28.3	Hal Crane	11:36.2
Mike Parykaza	2:00.8	Joe Sova	11:04.5
		Tom Sova	10:12.8

Junior HLG		Sr.-Open HLG	
Rich Persh	73.5	Ron Ganser, Jr.	119.4
Dan Aggers	69.6	Dan Belleff	106.6
Jerry Haynes	60.0	George Rivers	99.0

Indoor Scale		Peanut Scale	
Don Garofalow		Don Garofalow	
Rolf Gregory		Dan Srull	
Dan Srull		George Rivers	

QUESTIONS AND ANSWERS

This column has been an occasional feature in INAV since very early in the life of NIMAS. In general, any question on indoor topics is eligible; the answers are solicited from one or more fliers or else your editor fields the question.

43. Is quarter grain wood structurally better for IHLG wings than straight grain wood?

Ron Wittman offers the following comments: "Generally quarter grain wood is stronger in that it has a better resistance to warps. It will hold its shape better and longer; thus the airfoil stays flatter and doesn't have the tendency to accrue undercamber as will straight grain wood.

Quarter grain is also stiffer and won't flex as much on hard launches (wing flex cuts altitude). It also does not require as much sealer as straight grain wood to give a drag-free finish. Straight grain wood absorbs more sealer, besides taking more to fill the long grain holes!

I use quarter grain wood exclusively in my gliders, even for the fuselage, which is hard C-to-quarter grain. It is usually the weight of the very flaky cut that makes it more desirable, but another important factor is that it can be sanded thinner and still have adequate strength, since the straight grain wood requires thickness for its strength. I never check wood for strength, since I've never thrown the wings off a glider. However, low ceiling gliders might require more concern."

44. What is usually done to increase duration of indoor gliders when the model weight is matched to the ceiling and to the contestant's arm. That is, on the hardest throw the model does not hit the ceiling but lighter wings have broken.

Ron Wittman comments: "I wish there was a stock answer to that one! However, I'll comment on things I've tried. Many combinations of things need to be tried, but first try trim, provided the finish cannot be improved.

1. Bring the glider to zero-zero incidence and balance for proper CG location.
2. Gently increase incidence as you make flights until the glider upsets easily or even stalls.
3. At this point it gets touchy or even monotonous, but increase nose weight to remove the stall. This will increase altitude gained also. If the airfoil wasn't working to its potential the time will increase. Note the weight of the glider and the time as each change is made and the airfoil works harder. Keep adding weight and incidence until times start to decrease, then go back to the best weight with the highest time.
4. Open up the turn as much as possible and start checking for warps, since warps cost a chunk of time!
5. In final trim (up to 100') there should be no appreciable loss of altitude in transition (3" to 12" max).

One evening Bill and Bob Gibbs and I were flying in a 20' ceiling gym; we started experimenting with my record Cat. I Tara 16. We kept adding nose weight and increasing incidence to find out how much we could work the airfoil. Bear in mind that this glider was flying well enough to set the record and seemed as if it didn't need any improvement! This glider could easily reach the 29'11" ceiling at Wilmington, so adding weight seemed contrary.

Times started improving to a consistent 30-32 seconds and there were a few 34 second flights timed by Bill. We never told anyone about these times, but 34 seconds under 20' isn't too bad, is it?

When we tried this on Bill's glider, the same results were achieved. If I remember right, his old glider got to 28 seconds, so trim is all-important. Finally, other things such as turbulators can be tried.

The next thing is to match the glider's components - stab to wing, airfoil and moment arm. Larger stabs give better recovery, but make a glider fly slower and possibly decrease airfoil efficiency.

Smaller stabs are harder to trim for recovery but will fly the glider faster and let the airfoil work. Don't hold the airfoil back; check it out. It's the jackpot!

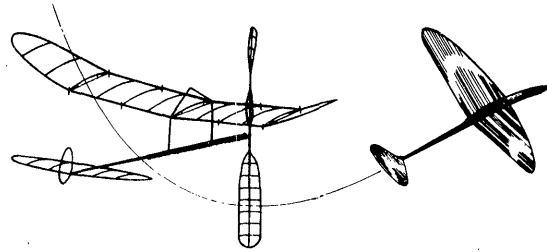
It took years to design my glider and match the components. I'll bet most glider fliers can't tell you why the moment arm is so many inches or why the stab has a certain area. 'Because it looks good' won't get it! Keep the rudder as small as possible or eliminate it if possible."



# INDOOR

## NEWS and VIEWS

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### \*\*\*\*NATIONAL INDOOR MODEL AIRPLANE SOCIETY\*\*\*\*

#### New Members!

W. RALPH DODSWORTH, 437 Ave. U South, Saskatoon,  
Sask., Canada  
ANTHONY J. ITALIANO, 1655 Revere Dr., Brookfield, Wis.  
53005

#### A Goof

Last month's photos included one of Patty Thornhill, but we called her Patti. That's not right - and we apologize. Patty is a hard worker and a nice person, however you spell the name, but now the record is straight.

#### Junior NIMAS Awards

Silver Cat. I HLG Award - 0:21.2, Bruce Pallet

Gold Cat. I HLG Award - 0:23.8, Bruce Pallet

#### Plans Wanted

Usually, our overseas correspondents keep us up to date on what is being flown in the various countries. We are quite low on model plans, probably because most fliers are still refining their one gram designs. So, any plans reflecting present one gram trends in the rest of the world would be most welcome!

#### Merry Christmas and Happy New Year!

Greeting cards are beginning to arrive from all over the world. I am very grateful for these good wishes and wish I could respond to all of them. Since I can't, I want to wish each of you the best for this season and for the coming year.

#### Financial Report

This issue simultaneously finishes the tenth year of publication of INAV and is the first issue of a new year. Our average circulation jumped from 289 per month to 322 per month, an increase of over 11%. This increase of circulation helped absorb the 10% increase of overall cost which came from a 25% increase in postal rates. However, total expenses of \$809.52 and total income of \$766.49 leave a 1971 deficit of \$43.03. Over the past ten years, this is the picture:

Year	Surplus	Deficit
1962		90.00 (est.)
1963		51.57
1964	23.95	
1965		13:56
1966	36.88	
1967	34.53	
1968	57.20	
1969	27.12	
1970	19.84	
1971		43.03
	199.52	198.16

The ten-year average comes out pretty well for a non-profit organization! However, the trend has been for lower and lower deficits as costs rise. At this point, we're at a decision point - raise prices, cut costs, or both. In times past, we had an advisory group; it has been several years since this group has been polled. So, guidance from the readers is in order to decide between these three alternatives:

1. Raise membership dues by 25% per year. For those who customarily pay with cash, this poses a difficulty of sending either stamps or coins for the extra.
2. Combine at least three issues, which saves approximately \$90 worth of postage. An extra page of coverage per combined issue (5 pages) would cost about \$18 per year, for a net saving of about \$70 per year.
3. Eliminate all photographs and publish six three-page issues and six normal issues (approx. \$70 saving.)

Please give your comments before Jan. 5, 1972. Those who renew can vote for #1 by including the extra amount.

Back to this year; the costs break down as follows:

Printing + office supplies	\$405.32
Newsletter postage	301.81
Correspondence postage	102.19
	<u>\$809.42</u>

Each issue requires about 50 hours of my time, and another 15 hours shared by the family and volunteer contributors and draftsmen. All correspondence and member services take extra time in addition to the 65 hours per month. Incoming mail totalled 747 pieces, while outgoing mail amounted to 1011 pieces.

#### SPECIAL INTERNATIONAL ISSUE

This issue is dedicated to all our friends outside the limits of the North American continent. Over the years, Indoor has become an international friendship, and these many friends are valued year 'round even when not specially mentioned.

#### FAI INDOOR REPORT

##### 1972 World Championship

Late word from the CIAM meeting confirms that England will host the 1972 Indoor World Champs, at Cardington on dates to be announced later. More details as available.

#### Team Confirmation

All three members of the '72 U. S. Team have confirmed their intent to compete. That makes it official - the Team will be Pete Andrews, Joe Bilgri and Bud Romak.

#### CONTEST CALENDAR

##### ILLINOIS - Chicago.

Dec. 19, 1971 - Delta Dart doubleheader - stock models for Juniors, and "souped up for "Experts". Grove Jr. High School, Elk Grove Village, Ill. Dave Linstrum, 5840 Danforth Ct., Hanover Park, Ill. 60103  
Jan. 30, 1971 - HLG & PennyPlane - Forest View High School Girl's Gym, Arlington Hts., Ill. Pete Sotich, 3851 West 62nd Pl., Chicago, Ill. 60629  
Feb. 20, 1972 - HLG & PennyPlane - Forest View High School Girl's Gym, Arlington Hts., Ill. Pete Sotich, CD.  
March '72 and April '72 - Cat. II contest - Brig, Gen. R. L. Jones Armory, Chicago, Ill. Pete Sotich, CD.

##### KANSAS - Olathe

Annual Winged Motors indoor meet, Feb. 19, 1972 at Millbrook Jr. High, Park & Waters Sts., Olathe, Kansas. Jr. Rubber, HLG, Easy B, Indoor Scale. Roger Schroder, 4111 W. 98th St., Overland Park, Kansas 66207. A special invitation is issued to Dick Hardcastle and other St. Louis fliers - "We do not plan to allow Dick to take all the trophies home again this year!!"

##### MARYLAND - Silver Spring.

Indoor sessions at JFK High School, 1901 Randolph Rd., Silver Spring, Md. Contact John Thornhill, Route 1, Mt. Airy, Md. 21771 for dates and times of sessions.

##### MASSACHUSETTS - M.I.T.

Indoor sessions at MIT Armory, Vassar St. at Mass. Ave., Cambridge, Mass. Jan. 8, Feb. 26, Mar. 11, 3 pm to 6 pm. Contest April 8, 1972, 1 pm to 8 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. ph. 358-4013.

##### NEW YORK - Long Island

Cat. I Record Trials (tentative) in March, 1972; Annual LIAMAC Indoor Meet at Cantlague Park, Hicksville, L. I., N.Y., April 30, 1971. J. G. Pallet, 30 Emerson Rd., Brookville, Glen Head, N. Y. 11545.

##### TEXAS - Ft. Worth/Dallas

Dallas Aeromodellers indoor contest, Dec. 27, 1971 at Samuel Grand Recreation Center, Dallas, 7 pm to 10 pm. No-Touch indoor duration, HLG, Indoor Scale.

# "PENNY PLANE"

11 MIN. 21 SEC. 1ST 1971 NATS

WING .22 P

BODY & TAIL .45 P & PROP

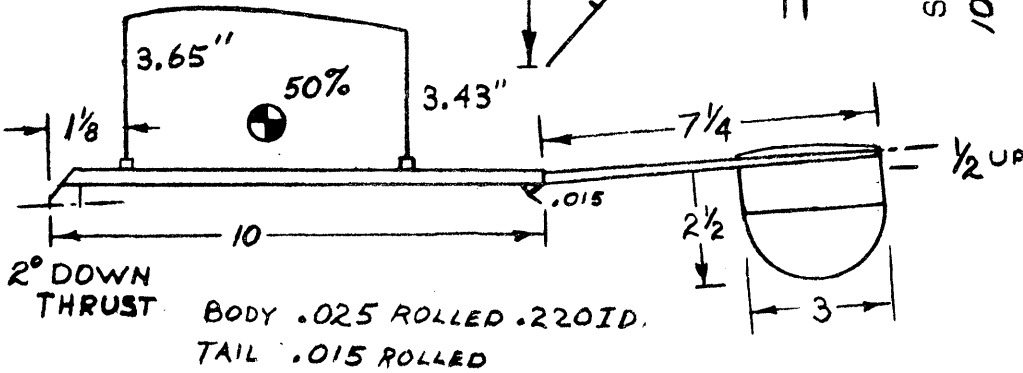
NOSE WT. .33 P

TOTAL 1.00 PENNY

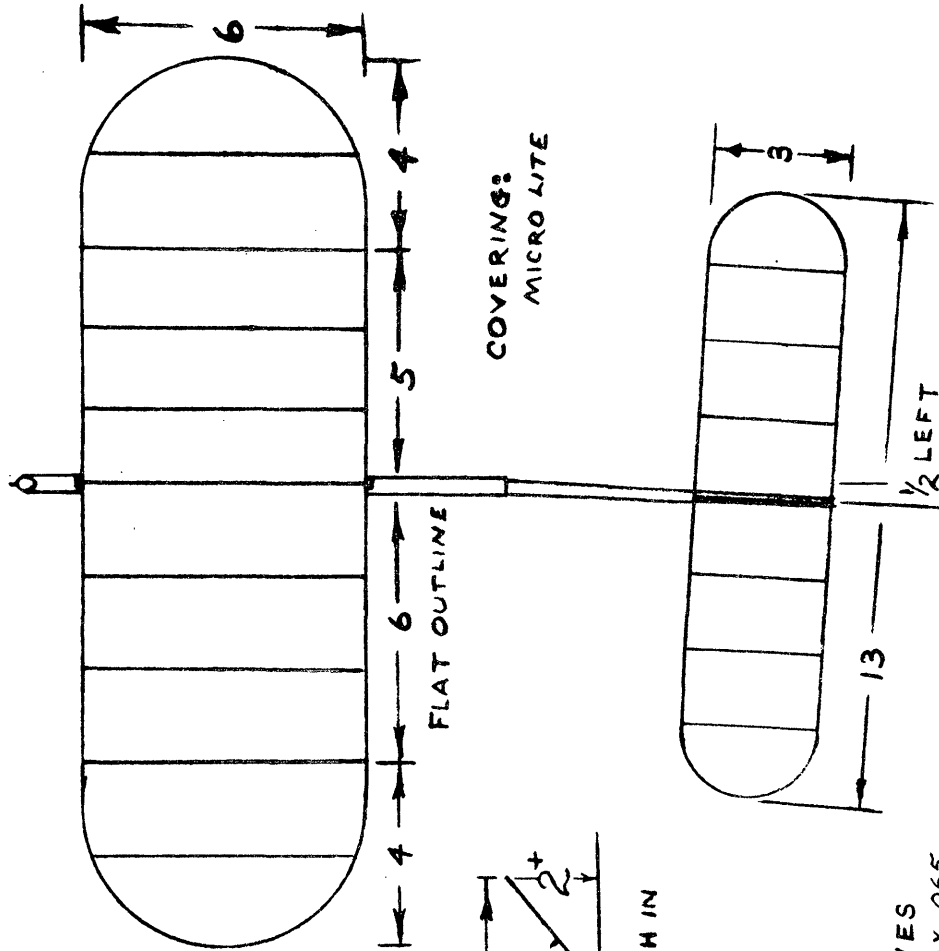
POWER .100 X 18 PERILLI

.80 P - 1350 TURNS

.7 INCH TORQUE



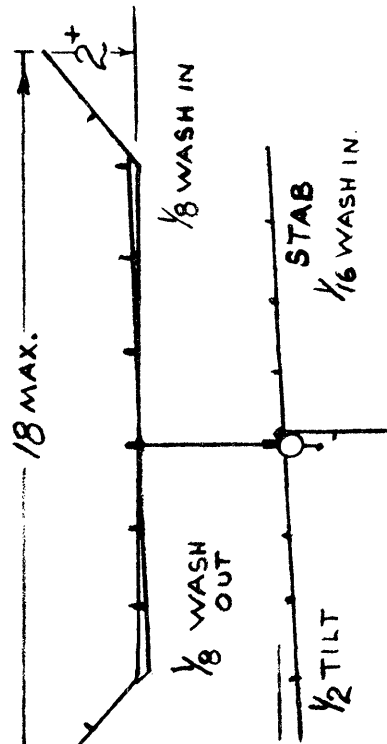
CG .085 X 18 LOOP PERILLI



COVERING:  
MICRO LITE

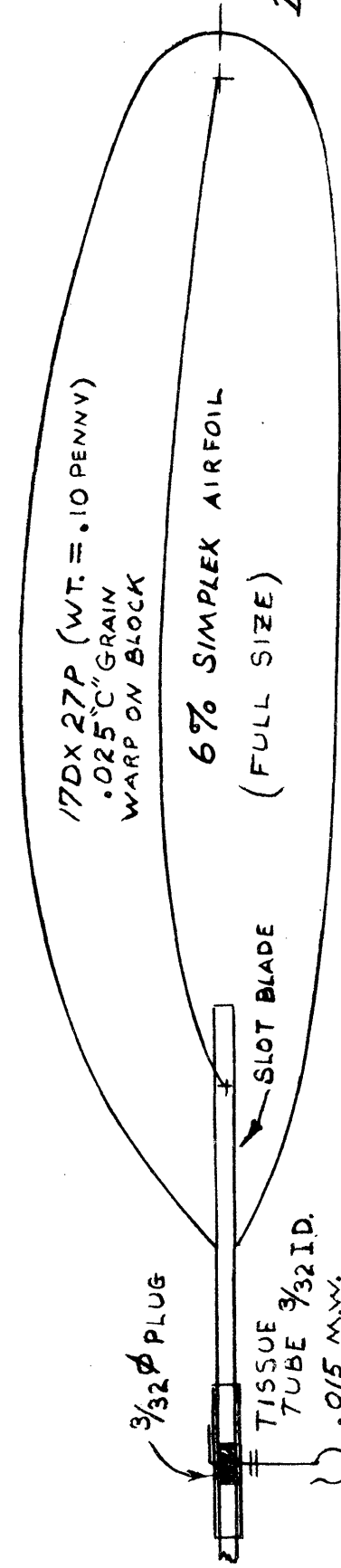
FLAT OUTLINE

OUTLINES  
L.E. .040 X .065  
T.E. .040 X .070  
TIPS .040 X .060  
STAB .040 X .050



STAB & RUDDER  
10" ARCH RIBS

BUILD LIGHT & ADD NOSE WEIGHT

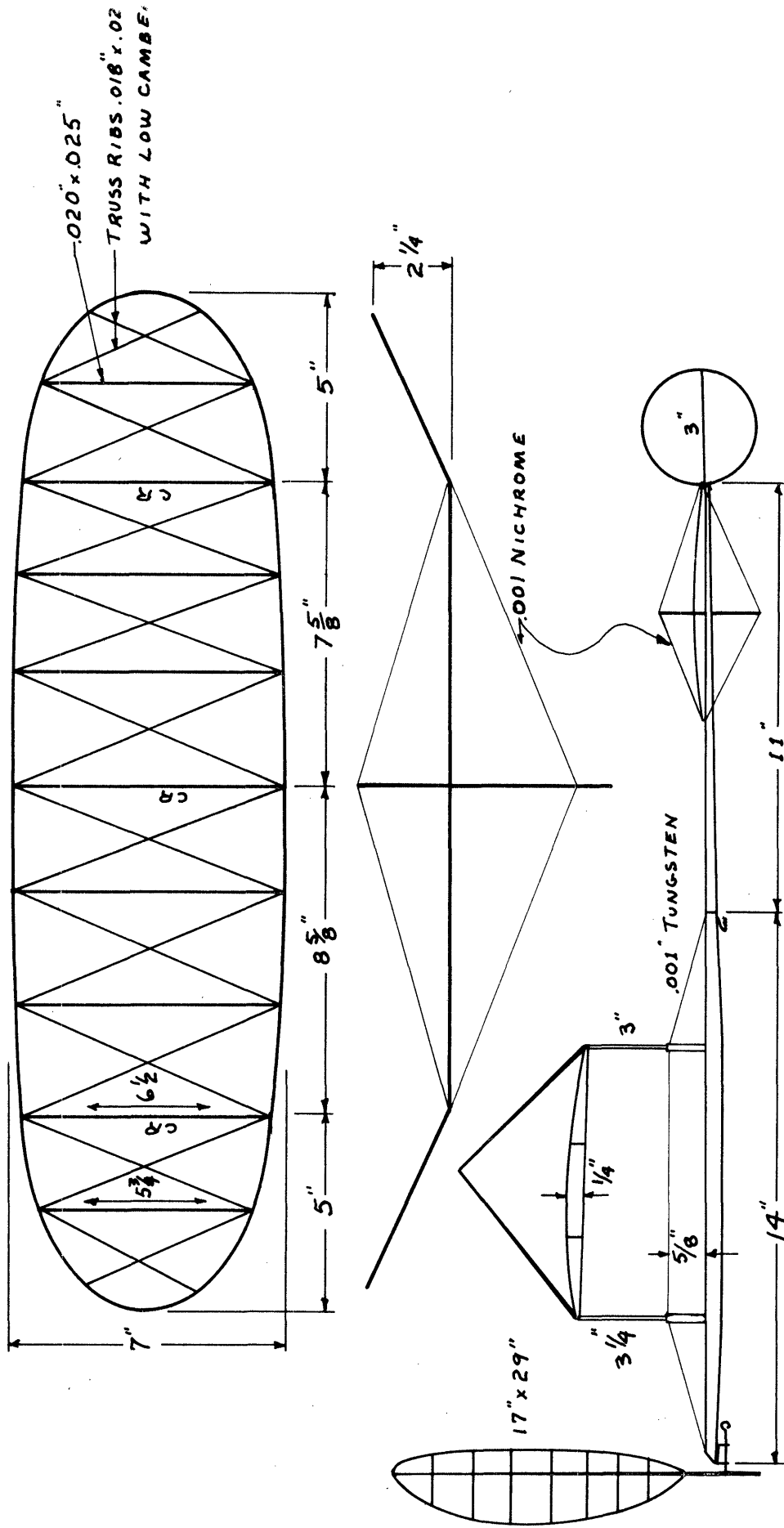


17 X 27 P (WT. = .10 PENNY)  
.025 C" GRAIN  
WARP ON BLOCK

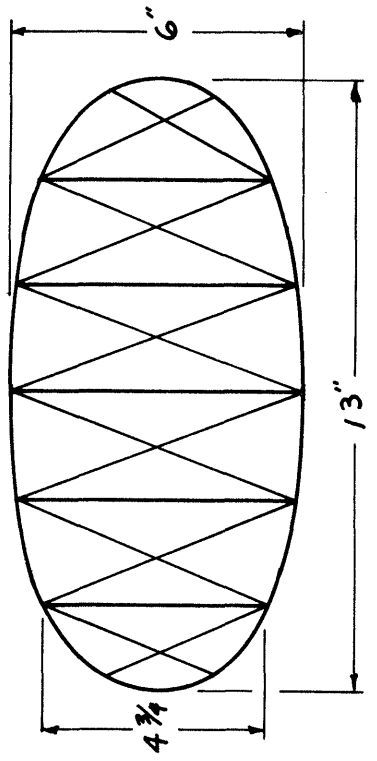
6% SIMPLEX AIRFOIL  
(FULL SIZE)

3/32 PLUG  
TISSUE TUBE 3/32 ID.  
.015 M.W.

D.M. JAECKS



AUSTRALIAN ONE GRAM  
 by BOYD FELSTEAD



**STATE OF THE ART**

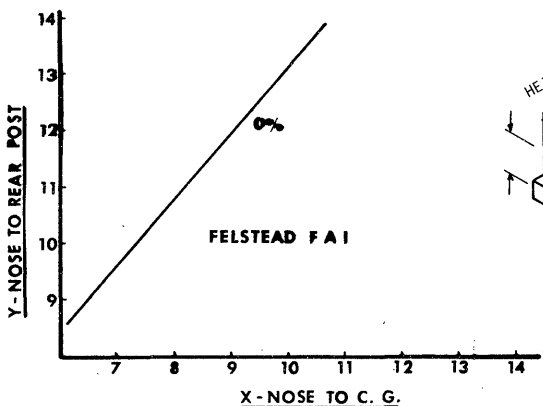
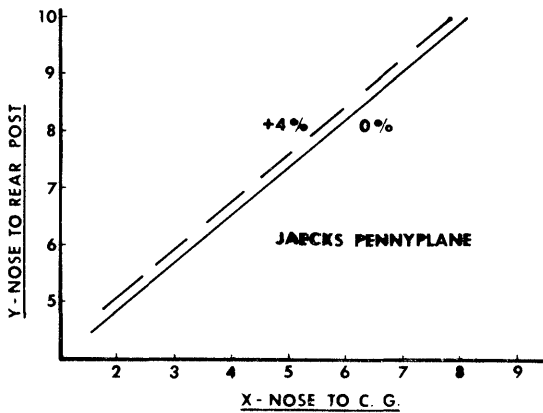
This month there is a dual offering - Boyd Felstead's one gram design represents the Australian continent for this International Issue, and Dennis Jaeck's PennyPlane is both a Nats winner and an outstanding design in this new model class.

The most outstanding aspect of Boyd's model is the geodetic-type wing and stab layout. The truss ribs have lower camber than the main ribs, and presumably are in tension. No flight information is available, unless Boyd sent this during the summer and it got misplaced.

Dennis Jaecks started with a good plan layout, added a unique trim/building philosophy, and created a very stable and capable winner. Of course, the wide wing is almost a must for the relatively heavy PennyPlane formula, to give a reasonable wing loading. Low wing loading permits a lower flight velocity for lower RPM; this low RPM tendency is then enhanced by the large prop. The model design formula also restricts model length, so the high aspect ratio stab effectively increases the tail moment arm. Dennis comments on the model:

"My design objectives are simple: build a light model to allow for nose weight ballast, which gives maximum wing and stab separation for good stability. The model is very stable which helps me space it between lamps, etc. The large prop permits using big motors - .100" rubber is the largest I have seen used at the Nats and this may only be a start to the right combination. The prop outline can be recognized as Jim Richmond's FAI pattern. I like the tissue tube prop hub as it allows easy blade alignment. I set up one blade and glue it, then test fly and adjust the second blade until the wobble is gone. Then I glue this second blade in place (thin glue at the edge of the socket is all it takes).

"Unfortunately, when I had the chance at the Nats to try other airfoils, I didn't. I had some 6% and 7% arc airfoils built up also. Using the no-touch rule would have made a fair test to see which is better. I don't know how much can be learned from PennyPlane, but it should show some benefits in FAI one gram design. Optimum PennyPlane chord has not been determined, but Charlie Sotich reported that 6" worked best for him."



**A LOOK AT YESTERYEAR**

A good many years ago (like 1941 and later), the popularity of indoor flying had declined until not much coverage was generated by regular model magazines. A labor of love by Walter Erbach and Curtis Janke resulted in the publication of the KOTDE Journal.

The Journal was to be the official publication of an organization proposed in the first issue - Knights of The Double Ellipse. Vol. 1, No. 1 was dated Dec. 1941, and contained an editorial proposing the KOTDE as a measure to help give indoor modeling a voice and a rallying point. Also presented were results from a Chicago contest, plans from Erbach's Fuselage model which had set a new record in the St. Louis Arena during the Mississippi Valley meet on Aug. 16, 1941, a humorous story, a "hints" column, a contest calendar, and an article on microfilm props.

It is fitting that, on this 30th anniversary of KOTDE founding, that we say a word of thanks to Walter and Curtis for their efforts to preserve Indoor. The Journal was whimsical, witty, informative, sometimes controversial, and doubtless welcome to indoor fliers of the day who had no other forum.

**HINTS AND KINKS**

Glider Sanding Jig

The sketch below details a sanding jig for HLG wings which was built by Bob Dunham from a design by fellow Glue Dobber John English. John's jig was made from wood, but Bob found plexiglas to be an improvement. The jig is for wings with straight trailing edge like the Sweepette, and makes it simple to produce an even airfoil by allowing the sanding block to ride on the edges of the jig.

The end stops keep the wing tight from end to end, and a shorter wing is wedged in place by removable fillers. Different wing thicknesses can be accommodated by shimming from the bottom, but care must be used to avoid sanding the trailing edge too thin. The wing leading edge can be finished easily and quickly after removing the blank from the jig.

An excellent sanding block for use anywhere is made by using contact cement to hold the sandpaper on 3" x 6" plexiglas. This makes a rigid and perfectly flat sanding block; two such blocks with a different grade of sandpaper on each face gives all grits needed to finish a wing.

End Lube Mess!

Wayne Zink suggests that rubber lube can be kept in a 15 cc nasal mist spray bottle (Dristan). All you need to do is remove the siphon tube and wash the bottle, and you have a handy dispenser for rubber lube. Be sure to mark the contents on the outside - this is a must for any drug container used for another purpose!

