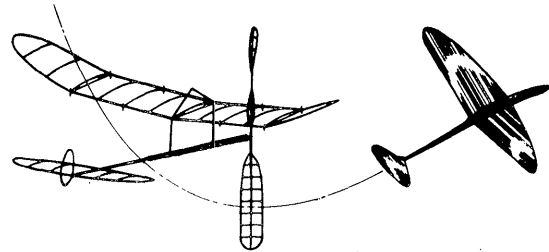


**INDOOR****NEWS and VIEWS**

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



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

New Members!

ROLFE GREGORY, 11603 Milbern Dr., Potomac, Md. 20854  
 DAVID A. PISHNER, 1574 Lee Terrace Dr., Wickliffe,  
 Ohio 44092  
 BILL SHAILOR, 13596 Montrose, Detroit, Mich. 48227

Family Memberships

DAVID OICKLE, 119 Martha Rd., Glen Burnie, Md. 21061

Tenth Anniversary Gift

Right after Christmas, Jim Clem paid a surprise visit to the Tenny household. Tucked under his arm was a Pitney Bowes Model 701R Addresser Printer and a box of blank plates! In addition, there was a \$50 gift certificate for Jody, to be redeemed at Titcher-Goettinger - one of Dallas' best department stores!

On this tenth anniversary of INAV, many NIMAS members and other modeling friends across the nation arranged this "thank you" surprise - a top grade piece of office equipment which will save hours each month addressing the newsletter. We can now stamp addresses directly without typing labels and sticking them on.

Jody used her gift certificate on a small stereo to go in our bedroom. It's really nice to be able to listen to our own music in a house with three teen-agers!

Both gifts will be used and appreciated for many years. But most of all we will remember with gratitude this expression of your friendship. Thank you.

Renewal Notice

The new method of addressing newsletters permits inclusion of a date code in the address. Now, each member and subscriber can look at his label; those who have "01" in the upper left corner of the address are due to renew with this issue. The normal method of notification will be continued; those who are due to renew receive a note to that effect plus a return-addressed envelope. The new number simply gives advance notice. Those who renew in advance of expiration save me quite a bit of time, so if this can be done it will be appreciated.

New Dues Set

Last month's poll about what to do about spiralling INAV costs showed that almost everyone favored raising dues by at least 25% per year. Some suggested 50%, some even suggested \$1, and many included donations to clear up the deficit from last year. The new addressing scheme will save over \$10 in label costs, and projected income increase from the increase should be about \$75 for a full year from now. This increase should hold for two or three years, barring another massive postal increase or a big increase in printing costs. Therefore, the membership dues (including subscription) are now \$3.25 per year and subscription alone costs \$2.25.

NIMAS Decals

Some time ago we made a plea for someone to help make up new decals; the NIMAS decal box has been empty for almost 24 months and many new members have never seen our rather distinctive decal. At this point, we need information from somewhere about what decals should cost. In Dallas, decal houses are either reluctant to talk about water-slide decals at all, or they talk in terms of \$500 orders. Can anyone do better? Should the NIMAS decal die, or is there a way to revive it?

FAI INDOOR REPORTTeam Manager Named

A December memo from AMA HQ named Bud Tenny as manager of the 1972 Indoor Team, in accord with previously established Executive Council directives. The same memo announced the dates for the 1972 Indoor World Champion-

ships as Aug. 25-28, 1972. The site is as previously announced - Cardington hangar. Housing will be at Cranford Aerodrome, which is the home of Britain's Institute of Aeronautical Technology (similar to NASA). Transportation will be furnished to the hangar each day.

Two Year Indoor Program?

Whether we have a two year or one year indoor program will depend upon the outcome of a questionnaire circulated by AMA HQ in December, with a Jan. 14 return deadline. The problems faced with the 1971 program seem to indicate that future participants will expect to vote on critical aspects of the program as they arise. This will be logistically impossible unless a two year program is adopted, or unless the semi-finals are finished by June 1 and the Finals are in late August.

Besides the one year/two year question, the form also attempted to settle the matter of single site/multiple site Finals. The questions were heavily slanted toward an outcome in favor of multiple sites, which may or may not be the best way to pick a Team. However, multiple Finals sites, as a concept, has the following disadvantages: greatly increased work load on the Program Administrator, greater (and unrealistic) pressure on each finalist, and unequal chances to make the team for entrants in different Finals. Apparently, the questionnaire was devised without consulting anyone with indoor experience. In this writer's opinion, the poll raises more questions than it will answer, and is probably divisive at a time when we all need to pull together again.

STATE OF THE ART

It has been a long time since a new Easy B design has made an impact on the competition scene. Perhaps the effort which would have gone into Easy B has been routed into PennyPlane; anyway, a couple of the best still around are the Easy B's by Al Rohrbaugh and Jim Richmond. So, these two have been reprinted from the Mar. '68 INAV, where we said the following:

Two of the top Easy B designs in the U. S. share the spotlight this month. The Kokomo Bomber by Jim Richmond and Al Rohrbaugh's Easy B are quite similar in design except for the rudder, and both models have rivalled times of Paper Stick models, even with all balsa props. Details are given on both built up and all balsa props, since the contests in the Midwest allow built up props on Easy B.

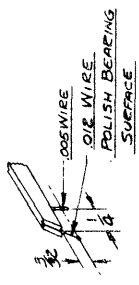
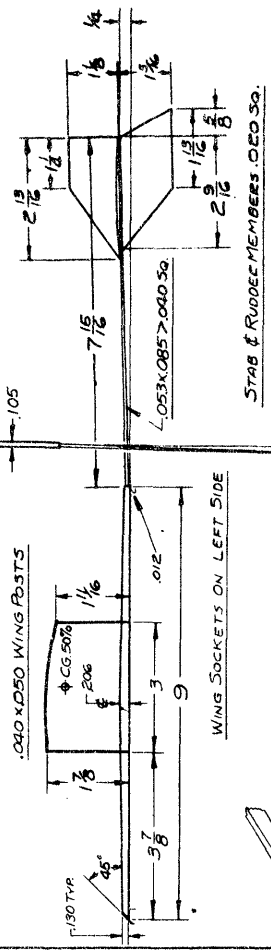
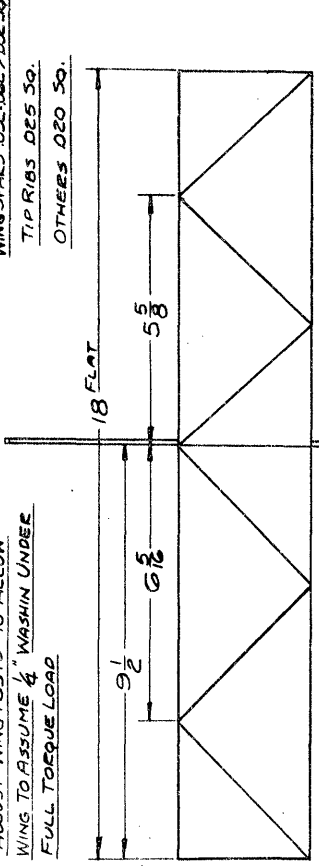
Jim explains certain design details of the Kokomo Bomber: "The stab is made without a center rib, but the paper is supported by means of a small balsa piece cemented to the boom. The wing rib layout adds strength to the wing by acting as a crooked spar. The fence on the stab trailing edge seems to reduce stall tendencies at the start. The extra wing offset was added for the same reason."

Al comments: "Although the light weight is an important factor for good duration, the prop is, as usual, somewhat critical. Due to the light wing, both tips will wash out under full power unless prop flare is enough to hold air speed low enough to prevent washout. The trick is to get maximum climb angle while keeping air speed just under stall. The wing is adjusted perfectly flat and the front wing post should flex sufficiently to permit the left wing leading edge to lift enough to give effective washin. When done properly, this method gives variable torque control while maintaining minimum washin. The rudder has approximately equal area above and below the boom to prevent rudder offset from twisting the boom. It might seem questionable to go to all this trouble, but it is a case of what the extra time is worth."

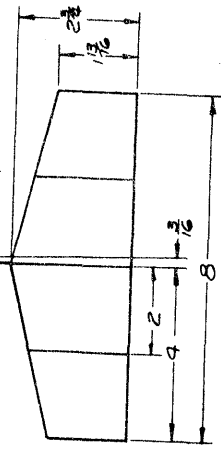
Editorial note: Since the above was printed, Jim set the Cat. I Paper Stick record with the Kokomo Bomber at a St. Louis contest in 1969 - 13:06! Also, at that time the CMOS diagrams were not being furnished for featured models. The diagram below combines the two models and shows the O% computation. Rohrbaugh's model (as shown) was flown with +19% margin, while Richmond's was in excess of +20%.  
 (CMOS on P. 9)

WING SPARS .025 x .042 x .032 SQ.  
 TIP RIBS .025 SQ.  
 OTHERS .020 SQ.

ADJUST WING POSTS TO ALLOW  
 WING TO ASSUME 1/4" WASHIN UNDER  
 FULL TORQUE LOAD



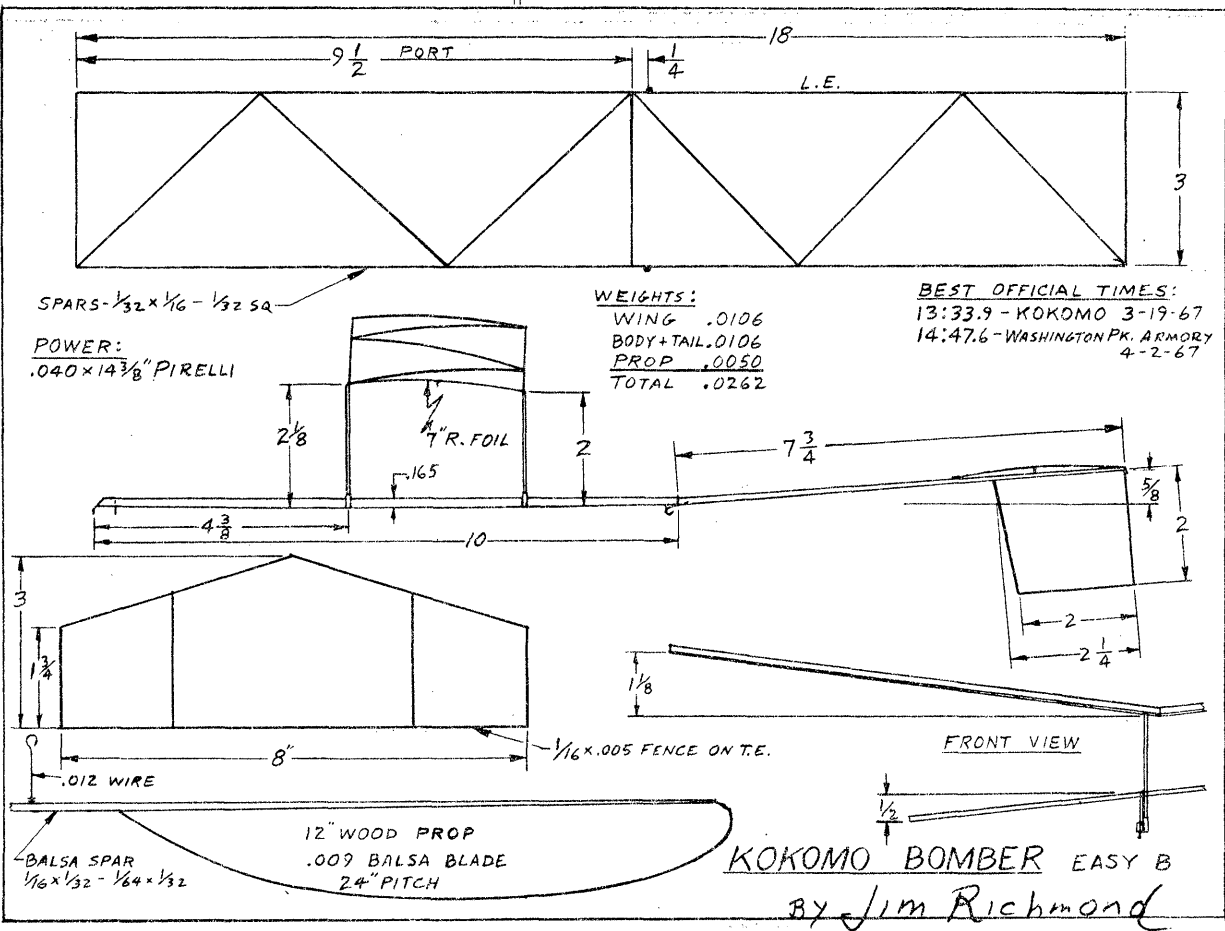
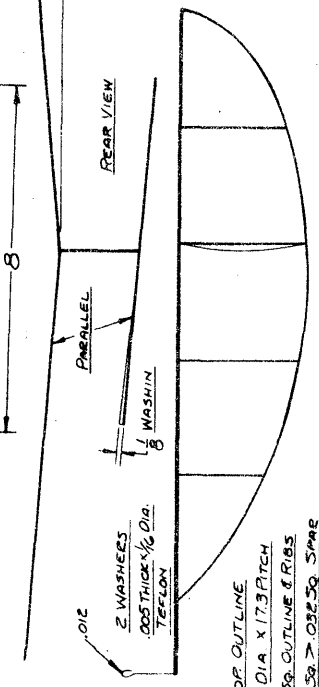
STAB & RUDEE MEMBERS .020 SQ.



WING	.011
STICKASSY	.013
PROP	.025
TOTAL	.029

BEST TIME - 13:33.9  
 SEPT. 10, 1966  
 16:30 TUENS ON  
 .038 x 1/8 LOOP PIRELLI

EASY B  
 A. RONEBAUGH



SPARS - 1/32 x 1/16 - 1/32 SQ.  
 POWER: .040 x 14 3/8" PIRELLI

WEIGHTS:  
 WING .0106  
 BODY + TAIL .0106  
 PROP .0050  
 TOTAL .0262

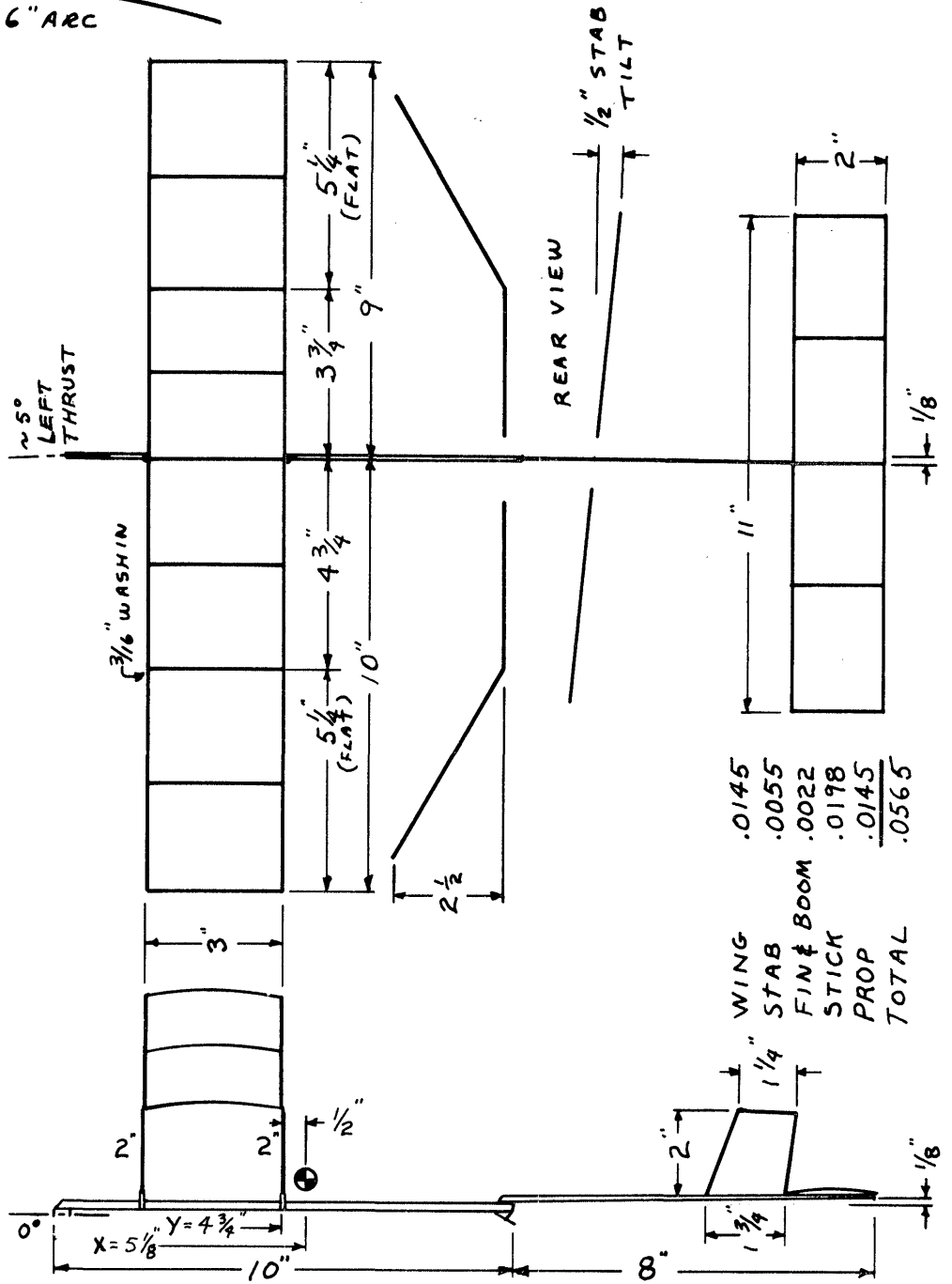
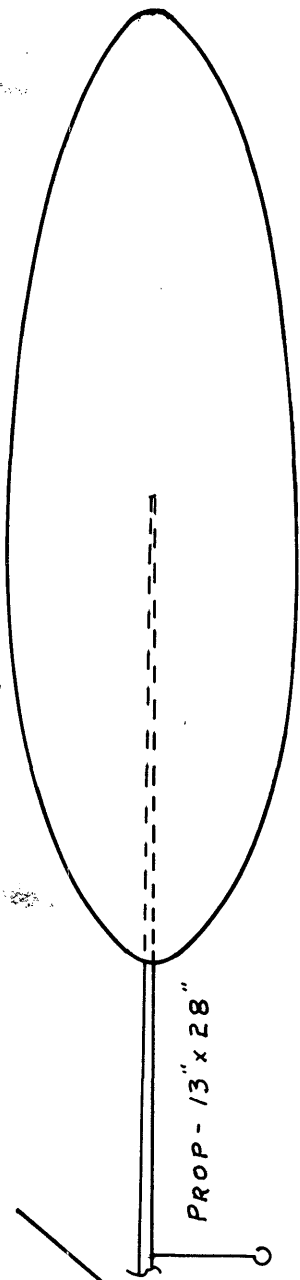
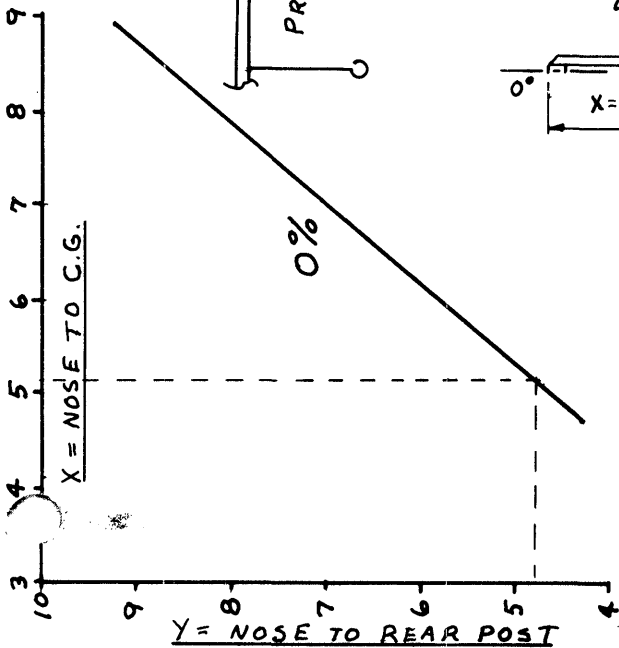
BEST OFFICIAL TIMES:  
 13:33.9 - KOKOMO 3-19-67  
 14:47.6 - WASHINGTON PK. ARMORY 4-2-67

Balsa Spar 1/16 x 1/32 - 1/64 x 1/32

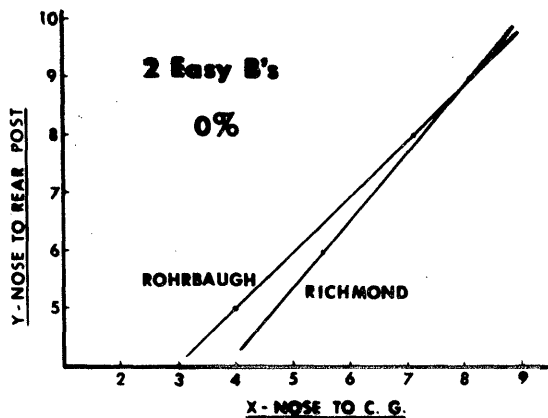
12" WOOD PROP  
 .009 Balsa BLADE  
 24" PITCH

KOKOMO BOMBER EASY B  
 By Jim Richmond





EASY '72  
 EXPERIMENTAL EASY B  
 BY BUD TENNY



#### CONTEST CALENDAR

##### COLORADO - Denver

Indoor meets on Feb. 20, Mar. 19, 1972; Stick (all classes combined), Easy B, HLG and scale. Contact Ted Gonzoph, 12996 E. 2nd. Ave., Aurora, Colo. 80010 for info on site and time.

##### ILLINOIS - Chicago

Indoor meet Jan. 30, Feb. 20, 1972 at Forest View High School Girl's Gym, Arlington Hts., Ill.; HLG & PennyPlane, Pete Sotich, 3851 W. 62nd Place, Chicago 60629.

##### ILLINOIS - Rock Island.

Roald Tweet, Dept. of English, Augustana College, Rock Island, Ill. 61201 hopes to get regular indoor flying sessions started in the college's new physical education facility, which has 50' ceiling. Contact him if you are interested.

##### 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 Schroeder, 4111 W. 98th St., Overland Park, Kansas 66207.

##### 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 session.

##### MASSACHUSETTS - Amherst

Indoor flying sessions at Student Union of University of Massachusetts in Amherst, Jan. 23, Feb. 20, Mar. 19, Apr. 16, 1972, 10 am to 5 pm. Charles Learoyd, 100 Mill Valley Rd., Hadley, Mass.

##### MASSACHUSETTS - M.I.T.

Indoor sessions at MIT Armory, Vassar St. at Mass. Ave., Cambridge, Mass., Feb. 26, Mar. 11, 3 pm to 6 pm. Contest Apr. 8, 1972, 1 pm to 8 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. ph. 358-4013.

##### MISSOURI - St. Louis

Indoor contests tentatively planned Feb. 6, Apr. 9 at Ft. Zumwalt High School, O'Fallon, Mo., 9 am to 5 pm. by Kirkwood Thermaleers. Mar. 5 at E. St. Louis Armory (34' ceiling), 2931 State St., E. St. Louis, Ill. 10 am to 5 pm, by McDonnell-Douglas FF Club. HLG, Delta Dart, PennyPlane, Easy B, Indoor Stick, Scale. Jim Bennett, 324 Helfenstein, St. Louis, Mo. 63119, ph. 314-962-5271.

##### NEW YORK - Long Island

Cat. I Record Trials (tentative) in March, 1972; Annual LIAMAC Indoor Meet at Cantiague Park, Hichsville, L.I., N.Y., April 30, 1972. J. G. Pallet, 30 Emerson Rd. Brookville, Glen Head, N. Y. 11545.

#### DESIGN FOOTNOTES

##### An Experimental Easy B

For about 18 months, it has been my intention to set up an Easy B with all the design advances inherent in the CMOS balance method, while making full use of big prop, high aspect ratio stab, and a couple of trim techniques learned from FAI flying.

The model was built during a brief vacation over the holidays, being finished about 20 minutes before we left for a contest it was to be flown in. It would be nice to claim a first place, but the contest event was a Ceiling Dodger event. Only about an hour was available for flying and the motor and prop broke on the first official flight.

Two last-minute attempts were made, both of which touched the ceiling at least three times. Best three-touch time in a 22' site was 5:15; even so, I was pleased. In spite of the "phantom CG" which caused me to call the model "Civvy Boy", the model literally "flew right off the board", as the saying goes. It rafter-banged perfectly and impressed everyone with its power handling ability.

The rearward CG caused a few qualms as I assembled the model, so I re-checked the CMOS calculations and decided that if I had so much faith in CMOS, I'd better live with the results! An analysis of the model served to increase my happiness with the results. I weighed it after flying, with the results shown on the plan. Only the wing is near the proper weight, and the heavy prop had too much weight in the blade and a terribly soft spar which showed up when the model was flown under high humidity. Obviously, a much lighter model can be built and should fly much better than #1. It already flies as well as any previous Easy B I've had, so the design seems to hold much promise. If anyone tries the design I'd welcome their comments.

Since I credit CMOS with much of the success of this model, here is a brief review how to use the CMOS diagram on the plan: Build the model as usual, and balance the entire model and motor (less wing) to locate the CG. On this model the CG was 5 1/8" from the nose (X). The vertical dotted line shows the graph intercept with the corresponding Y value of 4 3/4". Simply locate the rear post at the distance shown, and the front post where it has to be. Do not use a rearward CG unless the balance diagram works out that way! Most likely a more correct prop weight would have resulted in a more "normal" CG location, but the flight characteristics should have been identical.

Comments on trim: relatively large washin in the wing coupled with the stab tilt and 0% margin seem to be what yields the rafter-banging ability. If fact, the model has recovered from wall contact also. Matching the thrust line to the flight circle seems to measurably improve the power handling ability and smooth out the climb.

#### TORQUE ROD DESIGN DATA

Ray Harlan has computed the figures in the chart below, which represent safe design parameters for the torque rod in torqueometers. Column headings: d = diameter of the music wire; T = safe torque (fairly conservative) limit of the wire size; K = a proportionality factor determining proper length of the torque rod.

d	T (in.oz.)	K
.010	.31	6.20
.012	.54	2.97
.014	.86	1.60
.015	1.06	1.21
.016	1.28	.939
.018	1.83	.594
.020	2.51	.383

To use the chart for torque rod design, decide first what maximum torque you will need. For example, 1 inch ounce maximum includes rubber up through about .08" wide. Next, choose full scale torque for one revolution of the pointer (this value is t in the formula below). Finally, compute the wire length with this formula:

$$\text{length} = 6.28/tK$$

For example, assume .6 in.oz. per revolution on .015" diameter wire. t = .6; K = 1.21 and:

$$\text{length} = 6.28/(\.6 \times 1.21) = 6.28/.726$$

$$\text{length} = 8.64"$$

This length will be approximately correct for .6 in. oz. per revolution, due to small variations in wire. If an exact calibration (.6 in. oz. = exactly one revolution) is required, begin with a torque rod slightly longer and make trial calibrations. Cut off small lengths of wire until the calibration is as close as you desire. If you would like to see Ray's derivation or require information for different scale lengths, send a self-addressed envelope with your request to Box 545, Richardson, Tex. 75080 and I'll send a copy of his letter.

#### ADVANCE WARNING!

The Annual NIMAS Postal almost got left out last year, with FAI problems, etc. This annual event has been a lot of fun, and deserves better treatment than last time. So, be forewarned that it is coming up. Usually, events include Easy B, HLG, and Indoor Stick. In 1971 PennyPlane and Ceiling Dodger were added, but no entries were made in Indoor Stick and only two in PennyPlane. We are open to suggestions about which events should be held!

# INDOOR

## NEWS and VIEWS

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

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

### New Members:

CHARLES H. BACCUS, 900 Boynton, San Jose, Cal. 95117  
 BRIAN BROWNING, Peru State College, Peru, Neb. 64821  
 J. F. CARTER, Rt. #1, Drewry, Ala. 35468  
 BILL LANGLEY, 6229 N. Robinhood Ln., Kansas City, Mo. 64151  
 MICHAEL NARIGON, 1334 9th Ave. N, Ft. Dodge, Ia. 50501  
 PHIL RENNAKER, 6714 Lawson Ln., Kansas City, Mo. 64152  
 ROBERT ROVICK, 12404 Marine View Dr., Edmonds, Wash. 98020  
 DICK STARKS, 7906 NW Potomac, Kansas City, Mo. 64152  
 DONALD WRIGHT, 559 Evanswood Pl., Cincinnati, O. 45220

### The NIMAS Spirit

A long time ago, I received a lot of help from many indoor fliers as I began the struggle to learn indoor flying techniques while reasonably well isolated from the mainstream of activity. As NIMAS was founded and grew, this same spirit of helpfulness aided me to continue growing in experience.

Not long ago, a young man joined NIMAS. This same NIMAS spirit has again "turned on" full force, and this Junior has received willing help from several fliers all over the country. As I heard of this willing help, I was reminded again of the help I received, and I'm thankful that this willing spirit continues unabated. Thanks again to all of you!

### Recent Publications

"East Coast FAI Indoor Finals" is the title of a very good report on that event by Tom Vallee, in the Feb. '72 MODEL AIRPLANE NEWS. We owe a vote of thanks to Tom for this effort, and an especially kind word for MAN as they devote this much space to reporting one of our major events.

The following paragraph appeared in NAA NEWS, the news sheet of the National Aeronautic Association:

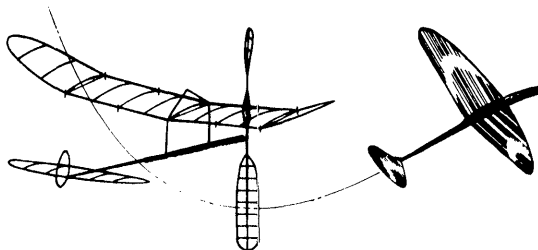
How long can a fixed wing aircraft (VTOL'S excluded) fly at less than one mph, without the benefit of wind? The world record is almost an hour and is held by Czechoslovakia. Next August teams from about ten countries will gather in a dirigible hangar at Cardington, England to try to beat that record. The occasion will be the 1972 Indoor Aeromodeling World Championships of the Federation Aeronautique Internationale, and the competing prop-driven aircraft will weigh only a fraction of an ounce and be powered by rubber bands. NAA's Academy of Model Aeronautics has already selected the U. S. Team, through flyoffs held last September at the airship hangars in Santa Ana, California and Lakehurst, New Jersey.

### Let's Have A Party

As much as various members would like to have a NIMAS party (general meeting), we never seem to find a time for this and haven't since 1962 (a NIMAS meeting was held at the '62 Nats). However, the Detroit Balsa Bugs are having a party - their 20th Annual Federation Aeronautique Internationale Awards Dinner on March 11, 1972 at the Polish Legion of American Veterans Hall Walter Paluch Post #12. The hall is located at 5186 E. Davison in Detroit.

In 1971 the attendance was 106, and 125 tickets at \$7 each are available this year. Cutoff date for getting tickets (pay in advance) is March 4, 1972. Phone or write Paul Crowley, 32604 Tecla Dr., Warren, Mich. 48093, ph. 294-0266, to get info and tickets.

The Detroit Balsa Bugs is an excellent club of long standing, and it is filled with many nice people who just happen to fly models very well. In fact, members of the club have made many contributions to both the theoretical and practical aspects of free flight modeling, and this program will be well worth attending. As part of the program, perpetual trophies will be awarded to the following fliers in their specialties:



Nordic  
Wakefield  
Indoor

Bernard Green  
Paul Crowley  
Ed Stoll and  
Ron Plotzke

### NIMAS Postal Meet

The 7th Annual NIMAS Postal meet will be open for entry through April 17, 1972. All flights made as part of a sanctioned indoor meet from Jan. 1 through Apr. 17 are eligible, as are flights made in informal sessions between now and Apr. 17, provided these sessions are run in accord with AMA rules.

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' 1" 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 on one day. 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 - send for copy if necessary.

### Postal Fudge Factors

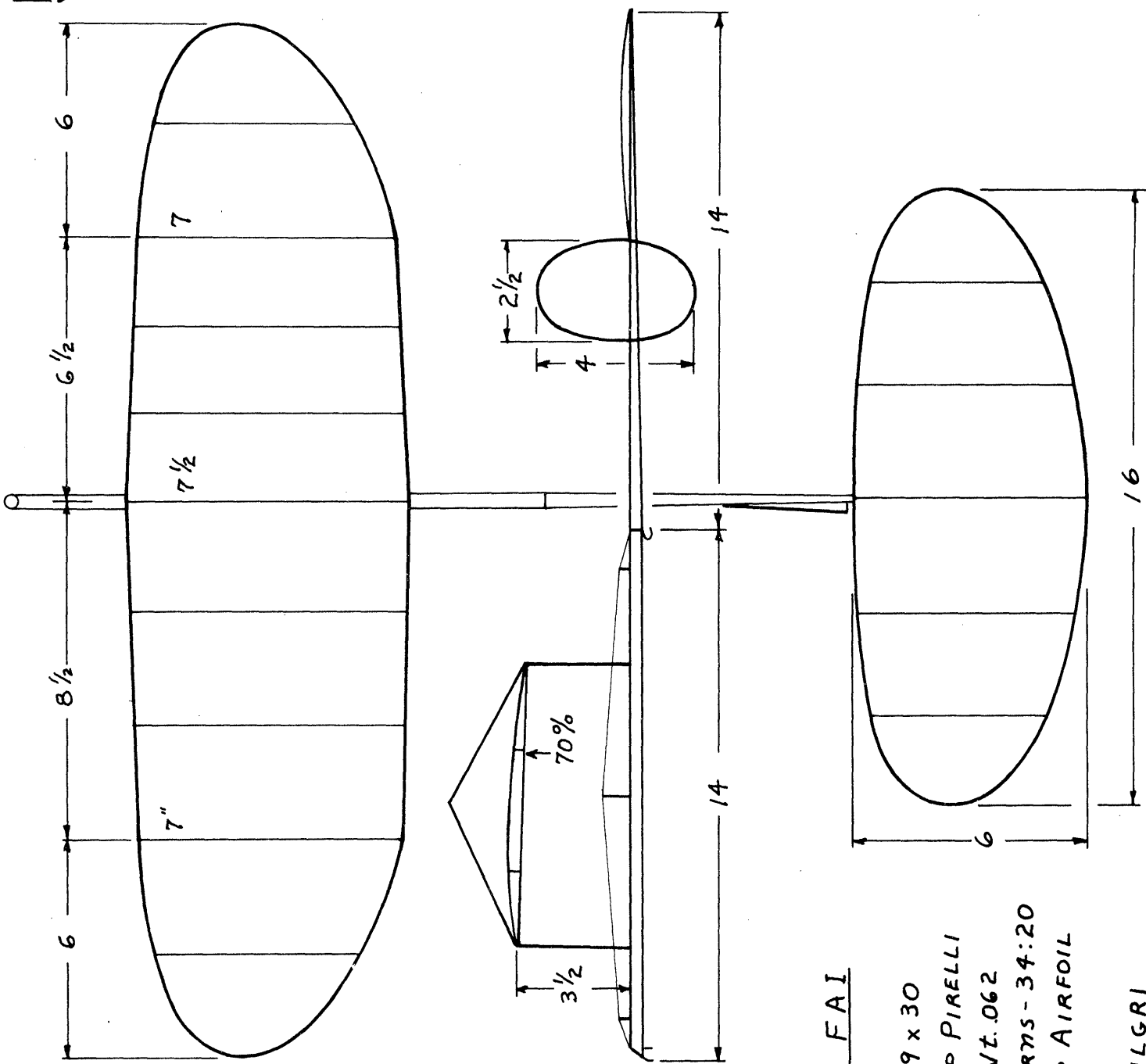
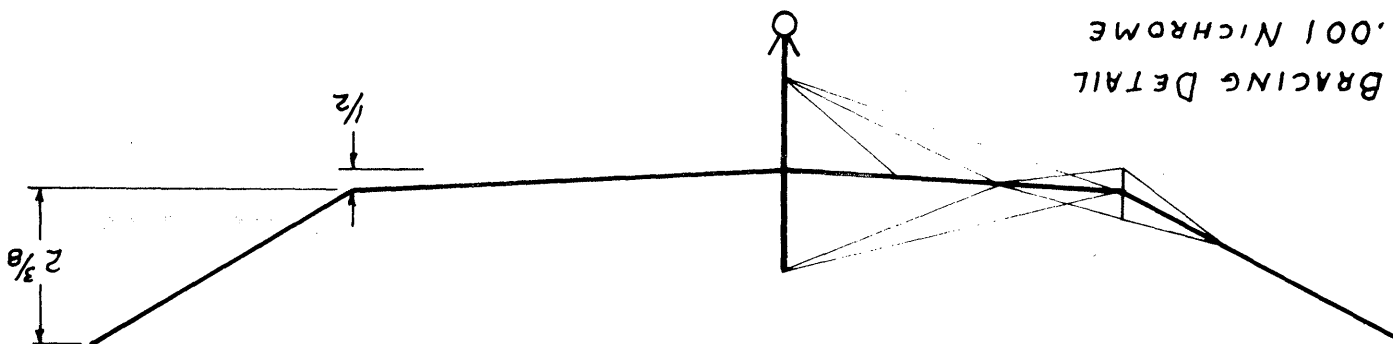
For some time, NIMAS Fudge Factors have been used to equalize ceiling height differences between postal meet sites. The rubber factors apparently have been satisfactory, and HLG factors have proved out pretty well so long as ceiling heights did not vary more than 1.4:1. The chart below summarizes these fudge factors as they will be used in the Annual Postal. Postal entrants can compare their time against existing results and decide whether to try harder before submitting times.

Ceiling (Feet)	Class I HLG (Fudge to 25')	Class II HLG (Fudge to 35')	Rubber (Fudge to 35')
18	1.39		1.394
19	1.316		1.357
20	1.25		1.323
21	1.19		1.29
22	1.136		1.261
23	1.087		1.234
24	1.042		1.207
25	1.0	1.4	1.183
26		1.346	1.16
27		1.296	1.139
28		1.25	1.118
29		1.207	1.098
30		1.167	1.08
31		1.129	1.063
32		1.094	1.046
33		1.061	1.03
34		1.029	1.014
35		1.0	1.0

To use the chart, select the model class and ceiling height to get the fudge factor, then multiply the fudge factor times the time. In case of ceiling heights not in even feet, use straight line interpolation. For example: 27 second flight in Class II HLG (25' site) would score 1.4 x 27 = 37.8 seconds. If entered in Class I, the same flight would score 27 seconds (fudge = 1.0).

### Flu, Anyone?

Three of the INAV staff have been ill, or are still ill. This mostly accounts for the lateness of this issue, and the feeling of frustration enjoyed (?) by the editor!



1 GRAM FAI

PROP - 19 x 30

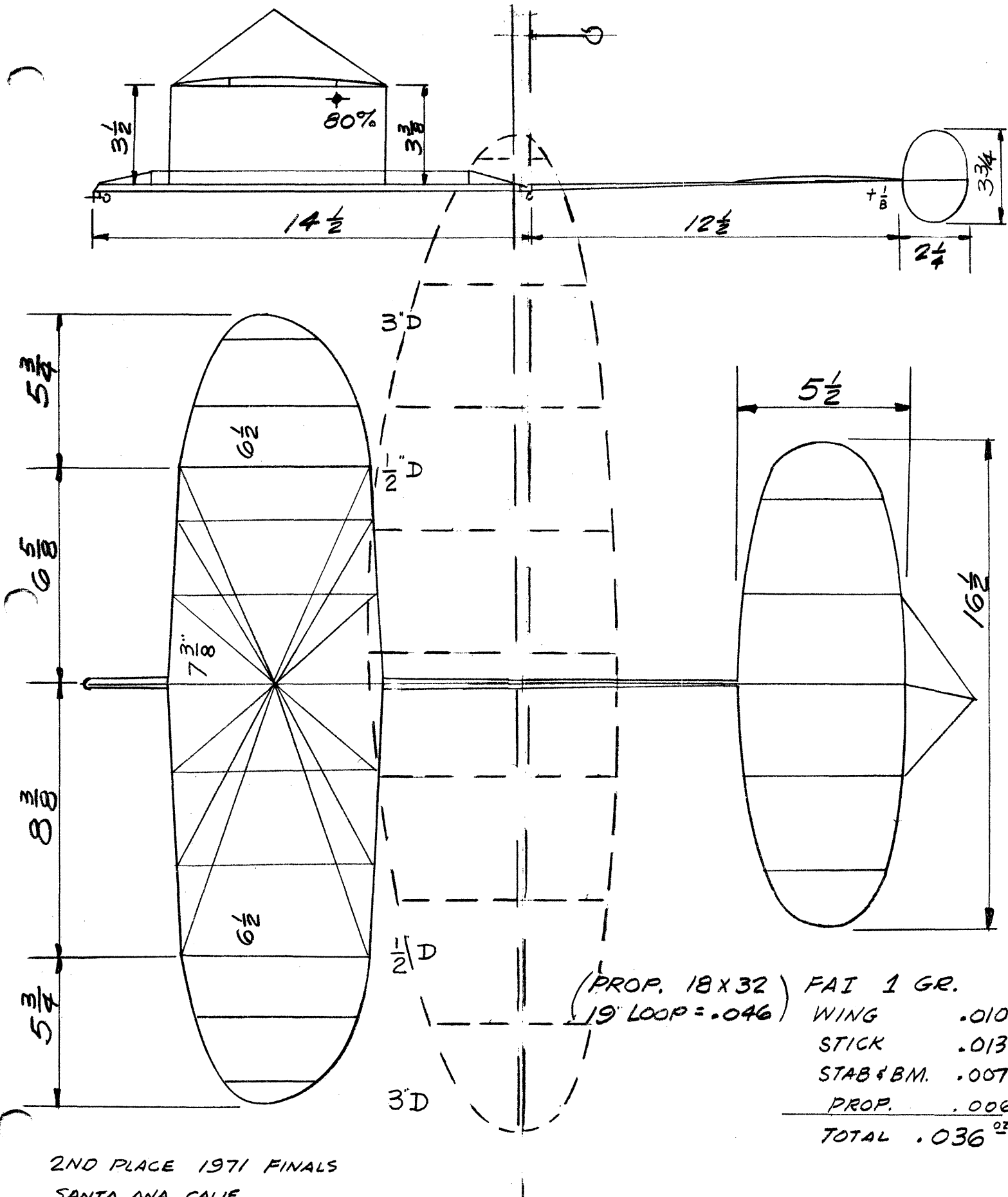
20" LOOP PIRELLI

LUBED WT. 062

2100 TURNS - 34:20

4% ZIP AIRFOIL

JOE BILGRI



2ND PLACE 1971 FINALS  
 SANTA ANA CALIF.

RECORD FLT. 35:42 SANTA ANA.

## Top Ten Easy B

This listing is from the results of the '71 NIMAS Postal meet, and will be scratched upon completion of the '72 Postal. The new Top Ten will be the top 10 places in the '72 Postal. However, an individual may "bump" into the listing with a flight made since the last Postal, and the list will be updated. (Note: Slight changes in these times are due to re-calculation on a calculator; slide rule errors apparently accumulated in previous listings.)

	Time/ceiling	Fudge	Score
1. Bob Platt	9:48.6/20'	1.323	12:58.8
2. Hal Crane	9:11.8/20'	1.323	12:10.2
3. Dick Hardcastle	11:23.6/31'	1.063	12:06.7
4. Clarence Mather	8:41.0/22.3'	1.254	10:53.3
5. Fudo Takagi	8:12.0/22.3'	1.254	10:16.9
6. Fred Harlow	6:42.0/20'	1.323	8:51.8
7. Chet Bukowski	7:08.0/25'	1.183	8:26.3
8. Bud Tenny	5:46.0/22'	1.261	7:16.3
9. Richard Sherman	5:29.0/25'	1.183	6:29.2
10. Don Chancey	8:15.0/58'	.776	6:27.8

## CONTEST CALENDAR

### COLORADO - Denver

Indoor meets on Feb. 20, Mar. 19, 1972; Stick (all classes combined), Easy B, HLG and scale. Contact Ted Gonzoph, 12996 E. 2nd. Ave., Aurora, Colo. 80010 for info on site and time.

### ILLINOIS - Chicago

Indoor meet Jan. 30, Feb. 20, 1972 at Forest View High School Girl's Gym, Arlington Hts., Ill.; HLG & PennyPlane, Pete Sotich, 3851 W. 62nd Place, Chicago 60629.

### MARYLAND - Frederick

The Frederick Model Airplane Club flies weekly in a high school gym. Contact Bill Weaver, P. O. Box 1387, Frederick, Md. for info.

### 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 session.

### MASSACHUSETTS - Amherst

Indoor flying sessions at Student Union of University of Massachusetts in Amherst, Jan. 23, Feb. 20, Mar. 19, Apr. 16, 1972, 10 am to 5 pm. Charles Learoyd, 100 Mill Valley Rd., Hadley, Mass.

### MASSACHUSETTS - M.I.T.

Indoor sessions at MIT Armory, Vassar St. at Mass. Ave., Cambridge, Mass., Feb. 26, Mar. 11, 3 pm to 6 pm. Contest Apr. 8, 1972, 1 pm to 8 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. ph. 358-4013.

### MISSOURI - Kansas City

Twice-monthly sessions are held in Kansas City in a 20' gym with smooth ceiling. Interested fliers may call Bill Langley at 741-0113 for details.

### MISSOURI - St. Louis

Indoor contests tentatively planned Feb. 6, Apr. 9 at Ft. Zumwalt High School, O'Fallon, Mo., 9 am to 5 pm. by Kirkwood Thermaleers. Mar. 5 at E. St. Louis Armory (34' ceiling), 2931 State St., E. St. Louis, Ill. 10 am to 5 pm, by McDonnell-Douglas FF Club. HLG, Delta Dart, PennyPlane, Easy B, Indoor Stick, Scale. Jim Bennett, 324 Helfenstein, St. Louis, Mo. 63119, ph. 314-962-5271.

### NEW YORK - Long Island

Cat. I Record Trials (tentative) in March, 1972; Annual LIAMAC Indoor Meet at Cantiague Park, Hichsville, L.I., N.Y., April 30, 1972. J. G. Pailet, 30 Emerson Rd. Brookville, Glen Head, N. Y. 11545.

### TEXAS - Dallas/Ft. Worth

The State Fair of Texas, a private non-profit corporation, will hold a multi-activity Spring Jubilee April 8 through April 16, 1972. Part of the activity will be an indoor contest with Indoor Stick, HLG, Scale, PennyPlane and Easy B. Bud Tenny, Box 545, Richardson, Tex. 75080, ph. 214-235-4035. Site details March issue.

## FAI INDOOR REPORT

### Indoor Survey Flop?

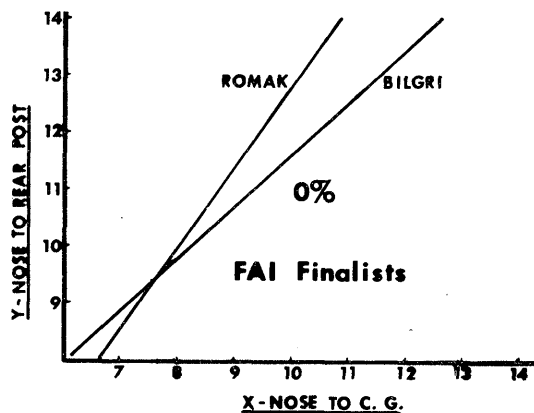
At the time of this writing, the survey mentioned in Jan. '72 INAV has been complete 34 days, and not one word of the outcome has leaked out of HQ. It seems likely that the outcome was not definitive, since there was considerable effort to steer the survey outcome by means of contrived and elaborate wording of the questions. In the last issue we dwelt upon disadvantages of multiple site Finals. It is interesting to note that FAI FF Finalist

opinions boiled down to an overwhelming 74% in favor of a single site, regardless of where it had to be held.

Just a few days ago, the AMA Executive Council finished their midwinter meeting. Discussion of a memo requesting full investigation of the Team Selection situation was neatly sidetracked by an assertion that a new document completely defining the situation was being prepared. The content was not revealed, so let's hope that it is more realistic than the last memo (p. 7, Mid-Dec. '71 Competition Newsletter). This memo dealt in generalities for the most part; other places specific suggestions were either highly impractical or logistically impossible. The overall implication was that two year programs would be necessary, yet we are seven weeks past the time when a two-year Indoor program should have begun. If a Program Administrator were to be appointed today, it would be wildly unrealistic to expect that a program could be designed, approved and announced before late May.

## STATE OF THE ART

The "dynamic duo" for the month represents first and second place at the West Coast Finals, flown at Santa Ana. Bud Romak's design remained mostly unchanged during the program, but Bilgri started from scratch between the Semi and the Finals. He credits Bud Romak with inspiration for the design, and for considerable encouragement to finish up in time! A certain "family resemblance" is there, and the performances were quite close under similar conditions in the hangar. The CMOS chart shows 0% margin as usual; if the drawings were exact scale, Bilgri used an actual stability margin of +1.4% and Romak used -7%.

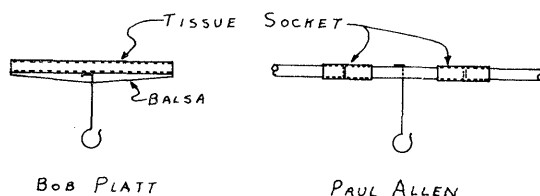


## HINTS AND KINKS

### Variable Pitch Prop Hubs

Bob Platt and Paul Allen have noted that better prop/model match is mandatory with one gram models. Each have suggested similar approaches to the problem - variable pitch hubs. Platt makes a balsa hub which mounts the hook, and adds a tissue socket rolled with white glue. Prop blades are then plugged into the socket and held by a little regular glue. To change either the pitch or a blade, he uses regular solvent which releases the blade without softening the white glue on the socket. Paul reports that "tack" cementing with regular glue and releasing with acetone works OK - the acetone evaporates before it has time to soften the hub.

Ed. Note: Neither Bob nor Paul mentioned two other advantages of socket-mounted blades. First, construction of the blades is much safer - has anyone dropped a block during the construction of the second blade? I have! Also, by using two sockets as Paul does, hub segments can be of different length to afford small changes in diameter as well as changes in pitch. It goes without saying that you should have a pitch checking jig to set up the blade angles!



# INDOOR

## NEWS and VIEWS

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

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

### New Members!

RICHARD F. DOUGLAS, 5303 Calderwood Ln., San Jose, Cal. 95118  
 BILLIE E. LANDRUM, 1166A Maple St., Ft. Dix., N.J. 08640  
 DONALD G. MURRAY, 2205 West 6th Ave. #1, Vancouver, B. C. Canada  
 LILBURN S. WATERS, Route 7, Box 263, Frederick, Md. 21701

### Family Memberships

CURTIS L. LANDRUM, 1166A Maple St., Ft. Dix., N.J. 08640

### Honorary Members

ANIANC MIRO, 4785 Castello, Venezia, Italy

### NIMAS Postal Meet

One question has arisen with regard to rules for the Postal meet - the PennyPlane no-touch rule. Because it is likely that a no-touch rule would not be uniformly interpreted, the Postal will dispense with the no-touch rule. In case of contests using this rule, a second watch can be started and allowed to run to completion of the flight to get the time for Postal entry. Flights eligible through April 17 - get the entries in!

### Recent Publications

Again we owe a vote of thanks to Walt Schroder for his April '72 Model Airplane News. This issue has a reprint of the article from Esquire - Ken Johnson's "Flip, Flop, the Ornithop." It is an entertaining article, and its appearance last year in Esquire brought out many enquiries, both to INAV and to indoor suppliers.

### '72 Nats

Although final approval (by the Navy) has not been received, AMA planning for the '72 Nats continues on the assumption that approval will be granted momentarily.

Tentative Indoor site is the Brig. Gen. Richard L. Jones Armory; 5200 S. Cottage Grove Ave., Chicago, this is the same site as for 1970 and 1971. HLG will be 9 am to 3 pm, Monday, July 24; Indoor Scale will follow, 3 pm to 9 pm. On Tuesday, July 25, all Indoor Rubber events will be held from 9 am to 9 pm. Three unofficial events, PennyPlane, Peanut Scale and Navy Scale will be held from 3 pm to 9 pm, July 24, sharing air space with Indoor Scale models as in previous years.

All indoor HLG fliers should note that the time-sharing approach will be used again this year. This means that alternate periods of test flying and official flying will be enforced. The goal is to allow only those launching official flights on the floor during the official flying periods; this minimizes turbulence for the gliders in the crucial touchdown phase of the flight. Note that official flights may be made during test flying sessions at the contestant's option - but no testing during the official sessions.

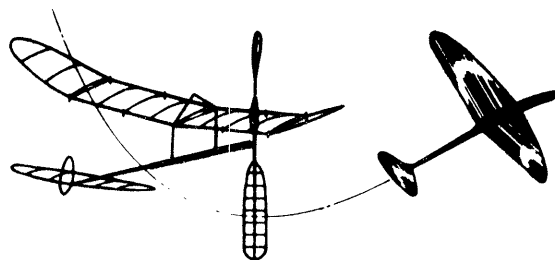
### Thanks Again

Both Jody and I had plenty of time last month to enjoy the new stereo purchased in part with our "10th NIMAS Anniversary" present - we spent most of the past month in bed! That's mostly why this issue is late, and lots of letters, etc. are overdue also. Illness sure slows one down!

### FAI INDOOR REPORT

#### Cranfield Charter

In order to encourage U. S. participation in the 1972 RC Pylon Internationals (held concurrently with the 1972 Indoor WCh), AMA is organizing a charter flight for both Indoor and RC participants (U. S. Teams will travel under other arrangements), including families of participants. Two possible periods are being considered: Aug. 19 or 20 through Aug. 28 or 29; and Aug. 23 or 24 through Labor



Day weekend. Those interested should register immediately with AMA HQ to obtain the latest information as it becomes available. The goal is about 40 people, with about 25 registered as of March 22, 1972. A special registration form appeared in the Mid-March Competition News; it is recommended that this form be used (copy OK) to register.

### FAI Survey Results

The Mid-February Competition News contained a detailed report of the Indoor Survey recently taken. In summary, this is what happened: 46 of 62 possible surveys were returned. The program to select the 1974 Team will be a one-year program, beginning Jan. 1973. Planning for this program will be done during 1972.

Other "decisions" based on the survey: A single suitable site within 600 miles of Kansas City will be the first object when deciding upon a Finals site. In the event that no suitable site is available, regional Finals will be held. A specific example cited is the possibility of Santa Ana/Lakehurst split as in 1971, assuming it is decided that a hangar should be used.

Comments: Considerable commentary has been directed to the utter unsuitability of having only two sites, due to the inequality of choosing the third team member. More comments reaching here indicate considerable dissatisfaction with the arbitrary and inflexible nature of the survey itself, which essentially steered the outcome. It may be a good idea for participants in the next program to demand another survey dealing with some of these questions where inadequate choices were given.

### Executive Council "Bombs Out"

In response to our editorial in Sept. '71 INAV, many FAI Indoor fliers contacted their Dist. VP's, requesting reform of the FAI situation and investigation of the situations leading up to the 1971 fiasco. In addition, we made direct appeal to the Executive Council with similar requests. The matter was an agenda item at the February Council meeting, but no discussion of grievances, problems or future direction was made. Instead, announcement was made of a document, almost ready, which would wrap up the whole problem. Apparently the document will be published without benefit of review by the Council, and the entire mess of 1971 will have been swept under the rug. We must anxiously await publication of this document!

One can only wonder why the Council abdicated its responsibility as outlined under Art. XI of the By-Laws. Since there is no procedure clearly spelled out for those who have grievances against HQ level administration, the Executive Council must be our court of last resort. Where now can we go?

### CONTEST CALENDAR

CALIFORNIA - Santa Ana  
 Record Trials at Santa Ana hangar, Apr. 16, May 14;  
 also PennyPlane contest May 14, 1972. Contact Bob Gibbs,  
 5005 Halifax Circle, Cypress, Cal. 90630 for details.

FLORIDA - Miami  
 Indoor contest at the Youth Fair Exhibit Hall, 107th  
 Ave. & Coral Way, Miami, Apr. 16, 1972. Peanut Scale,  
 PennyPlane, Easy B, HLG. Tom Cooney, 4245 Braganza,  
 Miami, Fla. 33133.

ILLINOIS - Chicago  
 Indoor contests at Brig. Gen. Jones Armory, 5200 South  
 Cottage Grove Ave., Chicago, Mar. 26, Apr. 22-23, 1972.  
 Events Mar. 26 - HLG, PennyPlane, Paper Stick. Apr. 22 -  
 PennyPlane, Paper Stick, Indoor Stick. Apr. 23 - HLG,  
 Plastic Prop Jr. Event, Scale. CD - Pete Sotich, 3351 W.  
 62nd Place, Chicago, Ill. 6-629, ph. 312-RE 5-1353.

MARYLAND - Frederick  
 The Frederick Model Airplane Club flies weekly in a  
 high school gym. Contact Bill Weaver, P. C. Box 1387,  
 Frederick, Md. for info.

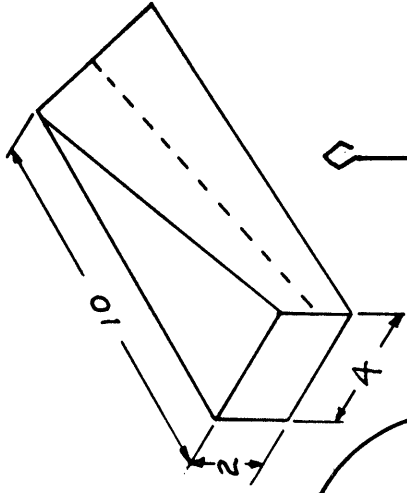
MARYLAND - Silver Spring  
 Indoor sessions at JFK High School, 1901 Randolph Rd.,  
 Silver Spring, Apr. 7, Apr. 14, Apr. 21, May 12, May 26.  
 John Thornhill, Route 1, Mt. Airy, Md. 21771.

BILGRI 1971 FAI PROP

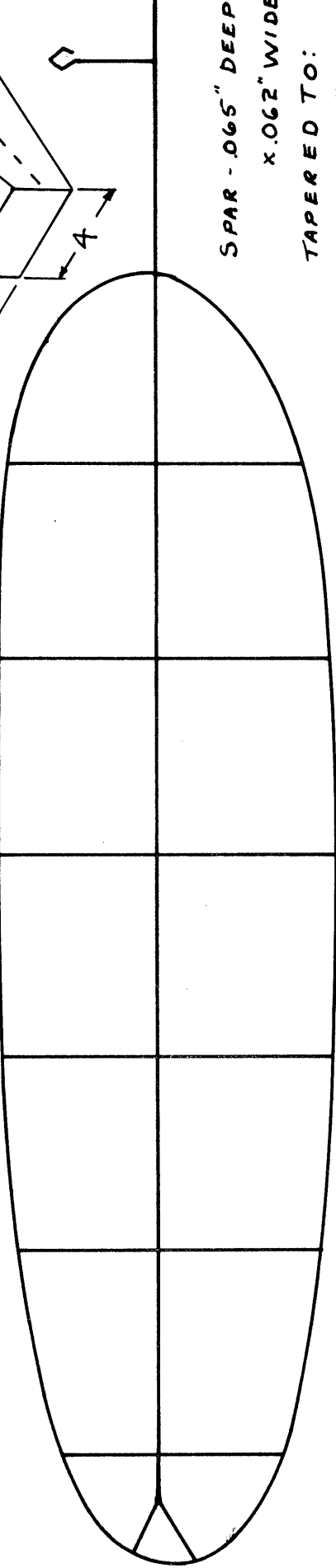
PROP WT. - .006 Z. W/BEARINGS

19 x 31

L.E.  
PROP RIB



SPAR - .065" DEEP  
x .062" WIDE  
TAPERED TO:  
.040" x .032" AT TIP

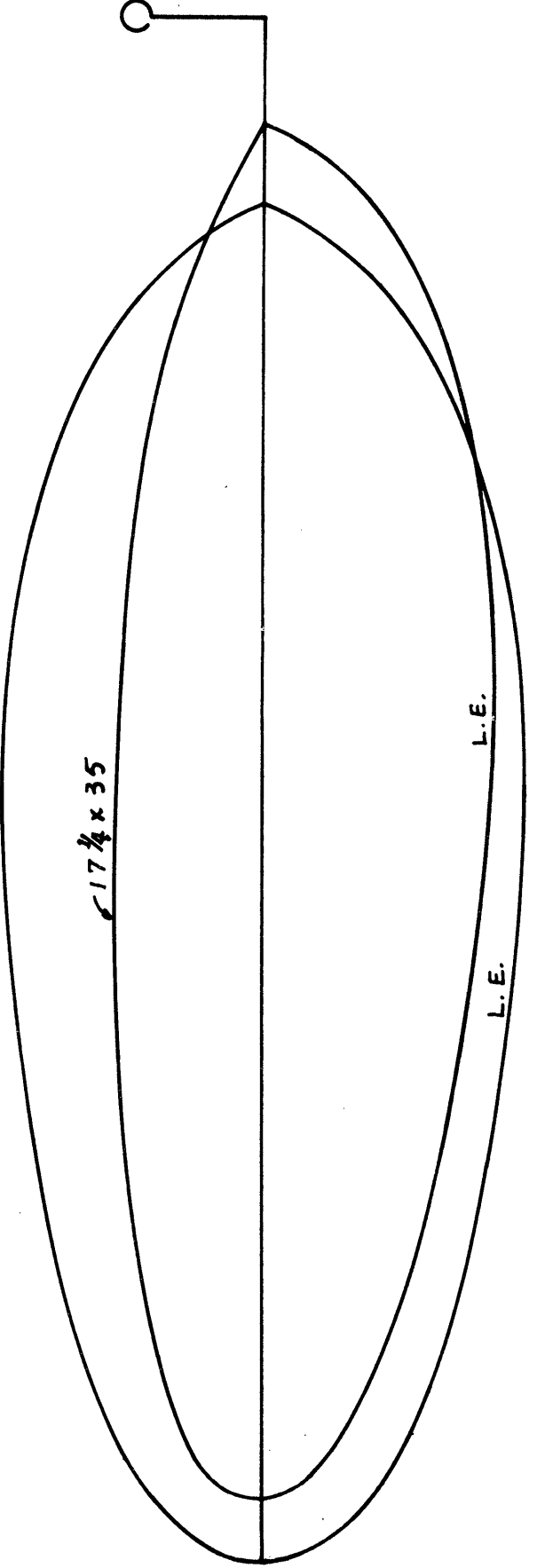


KOWALSKI PROPS

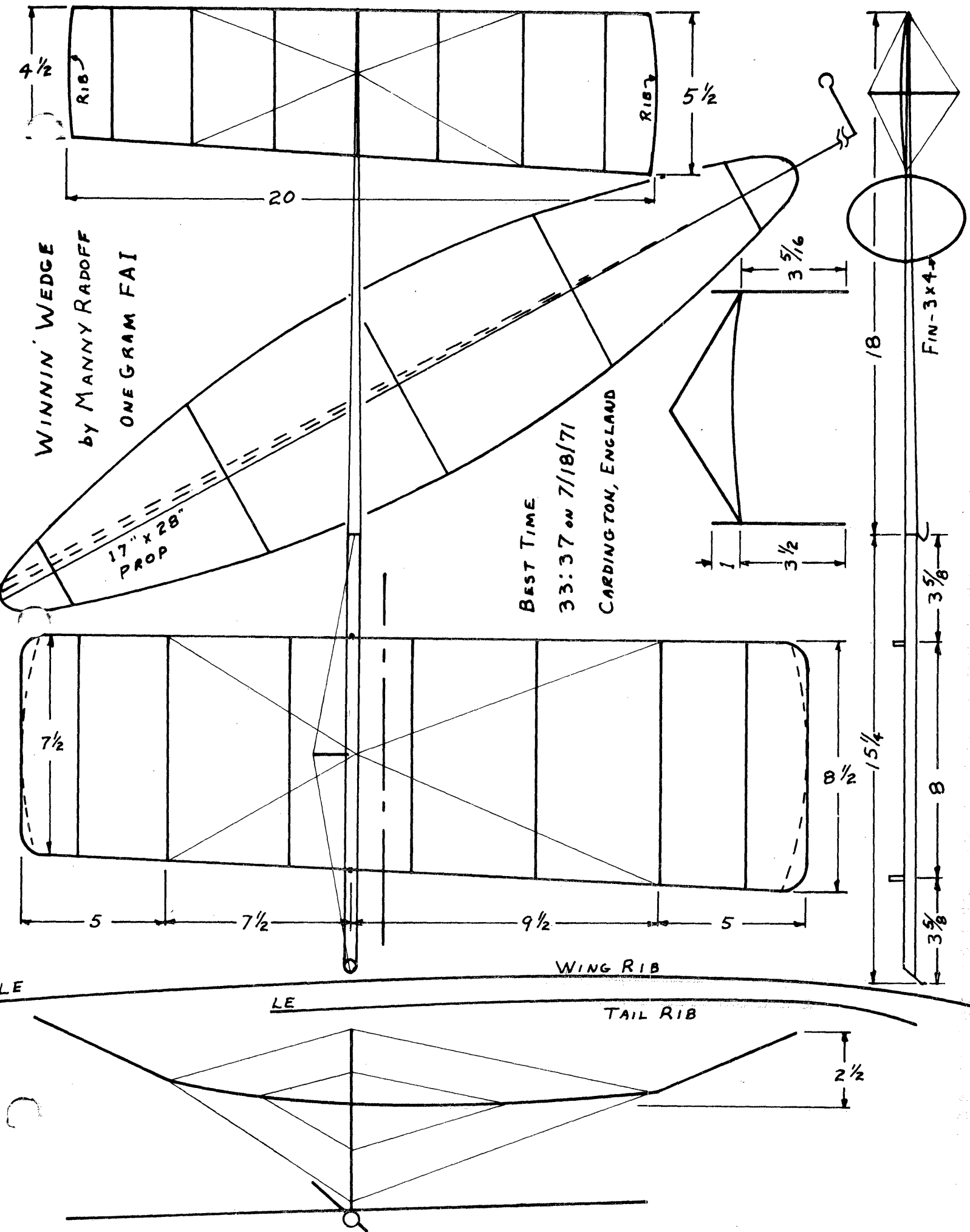
18 1/4 x 33

17 1/4 x 35

L.E.  
L.E.







#### MASSACHUSETTS - Amherst

Indoor session at Student Union of the University of Massachusetts in Amherst on Apr. 16, 1972. Charles Learroyd 100 Mill Valley Rd., Hadley, Mass.

#### MASSACHUSETTS - M.I.T.

Indoor contest at M.I.T. Armory, Vassar St. at Mass. Ave., Cambridge, Mass., Apr. 8, 1972, 1 pm to 8 pm. HLG, Indoor Stick, Delta Dart, Indoor Scale. Ray Harlan, 15 Happy Hollow Rd., Wayland, Mass. ph. 358-4013.

#### MISSOURI - Kansas City

Twice-monthly sessions are held in Kansas City in a 20' gym with smooth ceiling. Interested fliers may call Bill Langley at 741-0113 for details.

#### MISSOURI - St. Louis

Indoor contest Apr. 9 at Ft. Zumwalt High School in O'Fallon, Mo., 9 am to 5 pm, sponsored by Kirkwood Thermaleers. HLG, Delta Dart, PennyPlane, Easy B, Indoor Stick, Scale. Jim Bennett, 324 Helfenstein, St. Louis, Mo., 63119, ph. 314-962-5271.

#### NEW YORK - Long Island

Annual LIAMAC Indoor Meet, Apr. 30, 1972 at Cantiague Park, Hicksville, L. I., NY. Cat. II site; HLG, Easy B, Peanut Scale, Indoor Stick, Indoor Scale. CD Bill Dunwoody, 985 Ft. Salonga Rd., Northport, L.I., NY.

#### OHIO - Cincinnati

Indoor contest sponsored by Southwestern Ohio Free-fighters at Univ. of Cincinnati fieldhouse, April 16, 1972. Paper Stick, PennyPlane, HLG, Peanut Scale. For info: Donald Wright, 559 Evanswood, Cincinnati, O. 45220.

#### TEXAS - Dallas/Ft. Worth

The State Fair of Texas, a private non-profit corporation, will hold a multi-activity Spring Jubilee April 8 through April 16, 1972. Part of the activity will be an indoor contest with PennyPlane and HLG on Saturday, Apr. 8, and Easy B and Indoor Stick on Apr. 9. Hours 10 am to 5 pm; site is Automobile Building in Fair Park, with 24' ceiling. Bud Tenny, Box 545, Richardson, Tex. 75080, ph. 214-235-4035.

#### WASHINGTON - Kent

The Third Annual Boeing Management Association Model Aeronautics Scholarship Contest will be held June 24-25, 1972 at the Boeing Space Center, Kent, Washington. Indoor HLG and Easy B events will be held along with outdoor FF and Control Line events. Contact George Brownfield, 8330 12th NW, Seattle, Wash. 98107, ph. 206-655-8606.

#### STATE OF THE ART

Manny Radoff's "Winnin' Wedge" is a very interesting airplane which hasn't really been flown to top potential yet. Even so, it holds the current one gram record for Cardington, while flying at a weight of .040 oz. with a motor weighing .040 oz. Due to the 50% stab area set up in a relatively high aspect ratio, and an extra long tail boom, the 66% CG location left the model with a +18% stability margin. The relatively small prop and 1:1 rubber ratio used in Cardington left no reserve power for poor conditions at Lakehurst, so Manny plans to increase rubber weight and go up to 20" x 33" for prop size, while setting up for a lower stability margin. It is my prediction that these changes will make this design fly better; more important, there will be more "margin for error" under poor flying conditions. In its present form the model is an excellent ship for ideal to excellent conditions.

Some comments about the drawing: the wing offset as shown does not match the dimensions; the centerline drawn on the wing plan shows the proper location of the cabane and fuselage. The original square tip is shown, but this was ruled out as being over span limits at Lakehurst. So, a dotted line shows a 32.5 cm radius creating a tip which has to meet specs! This ruling is somewhat controversial and should be ruled on - at Santa Ana a similar planform was allowed to fly.

Manny has these comments: All ribs are inserted backwards; one day the thought occurred to me that the sharper curve in the rear would act like the flap on a commercial airliner or the turned down trailing edge used on some outdoor models. Compression ribs are used only at the dihedral break and are the solid tapered variety instead of built up. The model flies well with the wing centered, but turns better under power burst with the offset shown.

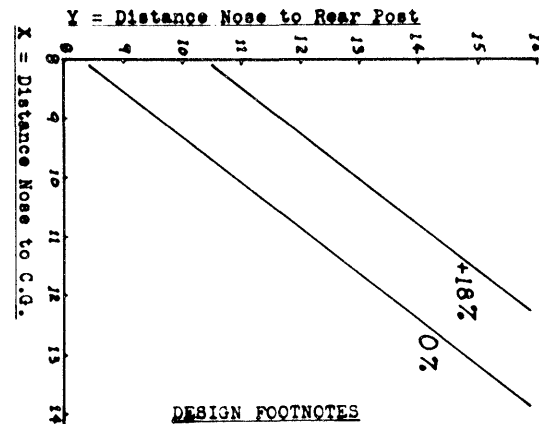
It was flown with about 1/8" washin. The wedge idea was intended to control torque, but I played it safe as I don't have much building time. Note that the front spars angle forward to the wide tips and the rear spars are perpendicular to the stick and boom.

Rubber size was .045" x 19" loop; the small size was possible because Sal Cannizzo supplied a piece of great quality rubber. Also, the small prop size with relatively low pitch reduced rubber requirements.

The center section of the wing has 1/2" of stressed dihedral to permit an expansion of the spars in an arc. Last year's trip to Cardington with a straight center section resulted in a warped rear spar. Finally, the boom had a slight warp which gave the stab about 2° negative incidence.

Note that the prop spar location is skewed (dotted lines) on the plan; make three props with #2 having the spar offset 1/16" at the tip and #3 having 1/8" offset at the tip.

Note: The CMOS diagram is turned 90° (space limits).



On page 3 there appear prop drawings from Joe Bilgri and Dick Kowalski. The Bilgri information is supplemental to the model plans contained in the Feb. '72 INAV. Dick's prop drawings were furnished in answer to a query about design changes made for the Finals last Fall. Essentially speaking, the basic design remains unchanged from that shown in the June '71 issue, except as noted in the comments below.

Dick made these remarks about his model changes: All changes were detail changes rather than configuration changes except for increased wing offset and prop changes to adapt the ship to hangar flying. Wing offset was increased to 2" semi span difference; the 7 5/8" center panel dimension became 8 1/4" and the 6 7/8" became 6 1/4" with no change in the tips. This was done to control higher torque levels needed in the hangar, while minimizing wing twist. With the original 3/4" wing offset, nearly 1/2" of spanwise twist was needed. The 2" offset wing handles full torque with less than half as much twist. The excessive twist destroyed optimum span-wise elliptical loading, and the new setup has restored proper loading.

The original 17 1/2" x 35" props were helical pitch progressive flare types with maximum blade width of 2.3". These were changed to 18 1/2" x 33.8" average pitch; non-helical pitch distribution with blades symmetrical about the spar and just under 3" wide. Prop pitch increases toward the hub, with changes set by mathematical analysis similar to velocity focusing. Both the pitch and blade area changes were based on flight measurements made over 4th of July at Lakehurst.

The wing changes give better control over the climb pattern under full torque, with no thrashing around as was experienced over 4th of July. The nose goes up steeply now and the climb is slow, smooth and steep.

The prop changes improved performance from launch RPM about 100 and cruise about 60 RPM, to about 72 RPM launch and below 50 RPM in cruise. This was with no change in rubber cross-section even though the loop was shortened 1" at the Finals.

#### THE LAB

#### Any Ideas?

In the process of operating the automatic rubber test apparatus (Sept. '71 INAV), some S-hooks were made from copper wire. A rash of motor failures - all at the hook - followed. Similar results followed with motors hooked to brass brazing rod. Has anyone an explanation why motors break under relatively low stress on copper or brass and not on S-hooks made from plated steel wire (paper clips)?

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

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

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

New Members!

SAL CANNIZZO, 20 Cooterbridge Ave., Staten Is. NY 10309  
 TOM COONEY, 4245 Braganza, Miami, Fla. 33133  
 JACK E. COWART, 119 Florida Title Bldg., Jacksonville, Fla. 32202  
 RUSSELL D. FULLER, RR#2, Box 85, Lake Canyada, Davenport, Iowa 52804  
 MICHAEL FULMER, 1600 W. Walnut, Apt. 8, Visalia, CA 93277  
 R. K. GERLITZ, 2225 Forest Dr., Waynesboro, Va. 22980  
 FREDERICK R. HAMLIN, Whiting Rd., Dover Mass.

'72 Nats

It is almost certain that the 1972 Nats will not be held. Shortly after the March issue, word was received that the hoped-for approval by the U. S. Navy would not be granted, and the Navy bowed out of their 25 year sponsorship of the Nats. Since that time AMA HQ and AMA President John Clemens have explored several possible alternatives to no avail. Planning had been going on to pick up on this situation, but the cancellation came too late to implement these plans this year. It is certain that there will be a '73 Nats, probably sponsored totally by AMA at one of two or three places already in planning.

At this time we must relax and remember with humble gratitude 25 years of Navy sponsorship of the Nats. In that time (and I remember with pleasure the first two "Navy" Nats, and most of them since), the Nats has grown to the wonderful competitive spectacle and fellowship we have come to take for granted. As a member of the AMA Nats staff nine years, I have been in an excellent position to understand the tremendous upheaval and expense a Nats meet causes on a Navy base. It is no exaggeration that the Navy did for us what we could never have done for ourselves over the past 25 years. At this time, it would be a very nice thing if thank-you letters be sent to the Navy, expressing our gratitude for their help in past years. Address any such letters to: W. Thompson, Rear Admiral, U. S. Navy, Chief of Information, Dept. of the Navy, Washington, D. C. 20350.

NIMAS Postal

This is to remind you that postal flights made through April 17, 1972 are eligible for entry in the '72 Postal. Entries have passed the 40 mark, which probably will make this our largest postal ever. Please mail in your entry promptly!

Rubber Stripper Offered

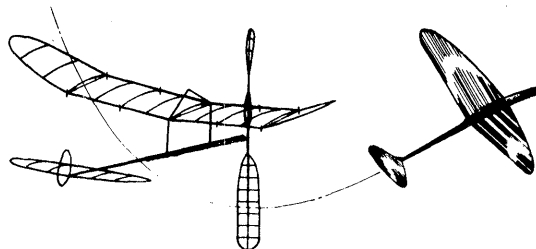
Tom Vallee has worked with a machinist to design and produce an excellent Roto-Shear type rubber splitter. Such a machine slices rubber with a uniform shearing action, producing excellent cuts of good uniformity. The price of these strippers will depend upon the number of orders received for each production run. If three strippers are ordered (three separate orders, you don't have to buy all three!), the price will be \$50 each. For six orders, the price drops to \$45; at nine orders the price drops to \$40.

If I understand Tom's memo correctly, the standard cutter assembly will cut .052, .058, .062 and .068 pirelli with one pass through 6 mm rubber. Other "standard" cutters make .065, .075, .030 and .070 or .050, .055, .040, .045 and .050 cuts. These two cutters are \$15 each when ordered with the basic stripper or \$16 ordered separately. Six other cutter head designs for "normal" 6 mm pirelli and six for "wide" 6 mm pirelli (over .255" wide) are listed. Tom says "Please note that these are extremely useful to the serious modeler for making accurate, repeatable cuts for critical applications, but that such a gadget is not necessary for successful contest flying."

Tom's address is 444 Henryton So., Laurel, Md. 20810. Drop him a line if you are interested; no production run can be made unless a minimum of three orders are received.

Dick Black Memorials

A long time ago INAV members began a memorial to Dick Black, in the form of tape-slide lectures on indoor topics



of all kinds. Two of these lectures were completed and have been enjoyed by many clubs, but we need many more to complete the job we started. The reason there aren't any more topics available is simply a lack of time. Each individual slide has to be photographed in color, which calls for either a special setup to stage the shot, or an eager photographer standing by while someone else is building a model or doing something else we need to demonstrate. Several individuals and clubs have offered to cover a particular topic such as indoor HLG, Easy B props, and other topics, but none have yet arrived in my mailbox.

So, let's try again! We need color slides on any part or aspect of any of the following suggested topics for Dick Black Memorials:

- |                                   |   |
|-----------------------------------|---|
| 1. Covering with microfilm.       | 10. Patching microfilm.                     |
| 2. Rolling sticks and booms.      | 11. Flight trim (movie might be best here.) |
| 3. Making built-up surfaces.      | 12. Winding models.                         |
| 4. Covering with condenser paper. | 13. Balloon steering.                       |
| 5. Rolling and mounting sockets.  | 14. Rubber stripping.                       |
| 6. Making all-balsa props.        | 15. Packing indoor models for travel.       |
| 7. Making built-up props.         |   |
| 8. Bending wire fittings.         |   |
| 9. Indoor bracing.                |   |

So, as you guys build new models, patch or repair, or make your flights in the NIMAS Postal, take some slides and we can begin to assemble more of these very effective training aids.

FAI INDOOR REPORTCranfield Charter

Insufficient interest was shown by potential users of AMA's charter flight to Cranfield Aerodrome in support of the '72 Indoor WCh and an international RC Pylon meet. In making the announcement cancelling their involvement, AMA HQ noted that the current "best buy" in charters to London is offered by International Travel Companions, Inc. P. O. Box 107, Cochranville, Pa. 19330, ph. 215-869-3500. Their offer is for a minimum of 15 persons, \$304 round trip airfare, Philadelphia to London and return. They can also arrange low cost lodging and travel assistance if this is desired.

AMA will make arrangements for food and lodging at Cranfield for Aug. 25-28, at \$75 per person. Final details of this will be made available soon.

RECORDS? MAYBE!

CAT. I RECORD TRIALS, Locust Valley, NY, Mar. 24, 1972  
 33' ceiling  
 Junior HLG - 0:49.2, Dan Aggers  
 Senior RCG Stick - 3:00.4, Ron Stransky  
 \*Junior Helicopter - 0:59.0, Richard Whitten  
 \*Junior Helicopter - 2:22.6, Dan Aggers

\*Both flights were made the same evening, and applications were filed on both. The usual practice is to award both fliers certificates, with the higher time standing as the new record.

CONTEST CALENDAR

CALIFORNIA - Santa Ana  
 Record Trials at Santa Ana hangar, Apr. 30 (changed from Apr. 14) and May 14, 1972, PennyPlane and HLG contest May 14, 1972. Bob Gibbs, 5005 Halifax, Cypress, Cal. 90630, 714-527-0251.

ILLINOIS - Chicago  
 Indoor contest at Brig. Gen. Jones Armory, 5200 South Cottage Grove Ave., Chicago, April 22-23, 1972. Events Apr. 22 PennyPlane, Paper Stick. Apr. 23, HLG, Plastic Prop Jr. event, Scale. Pete Sotlich, 3851 W. 62nd Place, Chicago, Ill. 60629, ph. 312-RE 5-1353.

MARYLAND - Frederick  
 The Frederick Model Airplane Club flies weekly in a high school gym. Contact Bill Weaver, P. O. Box 1387, Frederick, Md. for info.

## MARYLAND - Silver Spring

Indoor sessions at JFK High School, 1901 Randolph Rd., Silver Spring, Apr. 21, May 12, May 26. John Thornhill, Route 1, Mt. Airy, Md. 21771.

## MISSOURI - Kansas City

Twice-monthly sessions are held in Kansas City in a 20' gym with smooth ceiling. Interested fliers may call Bill Langley at 741-0113 for details.

## NEW JERSEY - Lakehurst

Flying sessions at Lakehurst Hangar #5, April 23, May 7, May 21, June 4, June 18, Aug. 6, 1972. Possible dates in Hangar #1 in June and July, probably night sessions. C. V. Russo. 143 Willow Way, Clark, N. J. 07066.

## NEW YORK - Long Island

Annual LIAMAC Indoor Meet, Apr. 30, 1972 at Cantiague Park, Hicksville, L.I., NY. Cat. II site, HLG, Easy B, Peanut Scale, Indoor Stick, Indoor Scale. CD Bill Dunwoody, 985 Ft. Salonga Rd., Northport, L.I., NY.

## WASHINGTON - Kent

The Third Annual Boeing Management Association Model Aeronautics Scholarship Contest will be held June 24-25, 1972 at the Boeing Space Center, Kent, Washington. Indoor HLG and Easy B events will be held along with outdoor FF and Control Line events. Contact George Brownfield. 8330 12th NW, Seattle, Wash. 98107, ph. 206-655-8606.

### CONTEST RESULTS

THERMALEERS FLY IN, Feb. 6, 1972, Ft. Zumwalt High School, Fallon, Mo. Cat. I.

ROG Stick (JSO)		AMA Scale (JSO)	
1. Jeff Hardcastle	3:51	1. F. T. Stark	71 pts.
2. Rosey Tryon	3:02	2. Art Biehl	57
		3. Cecil Cook	38

Junior Easy B		Sr.-Op. Easy B	
1. Jeff Hardcastle	4:15	1. Tony Schott	5:20
2. Doug DePaul	3:00	2. Jim Pears	4:53
3. Kevin Porter	2:23	3. R. E. Peters	2:34

Junior HLG		Sr.-Op. HLG	
1. Brent Frost	0:42	1. Dick Hardcastle	0:54
2. Jeff Hardcastle	0:41	2. Dale Frost	0:50
3. Rosy Tryon	0:30	3. Paul Tryon	0:49.8

Indoor Stick (JSO)		Simple Stick (Jr. only)	
1. Dick Hardcastle	4:10	1. Danny Biehl	0:59
2. Marion DePaul	3:54	2. Tim Potts	0:58
3. Pat Wood	3:30	3. Doug DePaul	0:55

Category High Time		Age Group High Time	
Tony Schott - Rubber		Tony Schott - Open	
Dick Hardcastle - HLG		Pat Wood - Senior	
Tom Stark - AMA Scale		Jeff Hardcastle - Junior	

MILWAUKEE AEROMODELERS' Chicago Indoor Contest, 4/20/72  
Forest View High School Girl's Gym Cat. I

Junior PennyPlane (3 best)		Open PennyPlane (3 best)	
1. Eric Miller	11:14.8	1. Chuck Markos	16:07.8
2. Al Stone	11:03.1	2. Howard Haupt	12:42
3. Steve Bandt	8:32.5	3. Ken Kraemer	11:37.3
4. Keith Gordy	8:14.9	4. Leonard Danber	10:03
5. Scott Wisniewski	7:08.2	5. Jim Noonan	9:54

Jr. Class A HLG		Open Class A HLG	
1. Keith Gordy	0:54.2	1. Mark Kummerow	1:02.8
2. Scott Wisniewski	0:52.9	2. Gordon Wisniewski	1:00.5
3. Fritz Curth	0:49.5	3. Chuck Markos	0:59.2
4. Rich Jaros	0:45.8	4. Charlie Sotich	0:57.2
5. Bill Schuh	0:39.5	5. Ken Krempetz	0:52.7

### THE LAB

#### For Want of a Knot

The torque tester (Sept. '71 INAV) has been busy with some wind-to-break tests on pirelli. A major problem has been failure at the knot; early tests failed at lower than expected stress. Careful observation showed that the knot was slipping to one side on the hook, so that all the stress was concentrated in one strand. A special clip was used to hold the knot straight, and failure stress went up quite a bit. However, 33 motors out of 50 (66%) still failed at the knot; both strands failed simultaneously, amputating the knot. As an example of the stress involved, a piece of .067" pirelli failed at .988 inch ounces torque level!

So, is there some method of making a loop besides a knot? The other end of the motor is under the same stress where it goes around the hook, but there has never been a failure there even though this is in the form of a single strand. Any ideas?

### FOLLOW-UP

The March '72 issue related how Radoff's Winnin' Wedge had wingspan problems at the Team Selection Finals. That is, it was claimed that the wing tips should have a radius of either 65 cm or 32.5 cm. It is my personal opinion that this interpretation is in error, and the following remarks by Ray Harlan state the case for the legality of absolutely square tips:

"Wingspan is the lateral extent of the aircraft, lateral being normal to the fuselage reference line. Hence, any diagonal measurements are not within the meaning of wingspan. The shape of the tips is irrelevant. Note, of course, "extent" refers to the projected planform, as the wingspan is a single, rectilinear measurement."

### And Again

The March '72 issue related sad experiences with copper and brass hooks used with pirelli in torque tests. Fudo Takagi relates this experience which sheds some light on the problem:

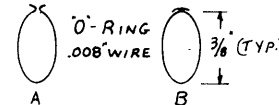
"After a flying session I stuck some wing rubber bands in my sweater pocket which happened to have some pennies in it. Several days later I used the sweater and found the pennies and rubber bands stuck together. The rubber bands were sticky and the pennies had turned black where the rubber had touched them. Also, the bands were weak and had lost their elasticity. Apparently the sulphur in the rubber had combined with the copper, turning it black to copper sulphate. This unvulcanized the rubber a bit to weaken it." Since then, I have never used anything having copper in it in contact with rubber motors."

It would seem the same precautions would apply on cold days - don't warm your motors in the same pocket where you carry your change!

### HINTS AND KINKS

#### Wire O-Rings

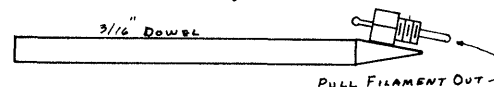
The Mar. '67 INAV hinted that a rubber O-ring slipped onto the motor before tying the knot would simplify hooking and unhooking the motor, besides permitting hook-up without losing turns. Fred Weitzel suggests that small wire can be formed into similar fixtures. The sketch below shows how: form an oval with small hooks, then hook the hooks and squeeze them shut. Relative weights: rubber O-ring - .002 oz., wire (010" wire) - .00045 oz., (.008" wire) - .00035 oz. Very small plastic sleeving 1/4" long slipped on the ring adds .0002 oz; I doubt it helps much, but it makes me feel better!



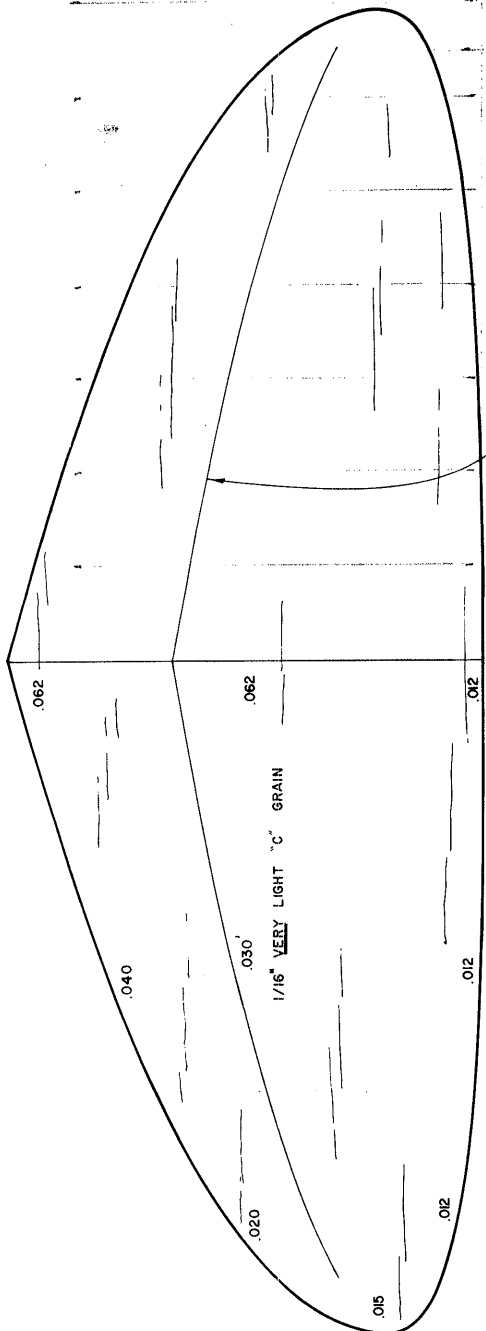
The above was reprinted from an early INAV. Since that time, several seasons of flying have confirmed the practicality of using such "O" rings. A good source of wire for these hooks is #00 stainless steel insect mounting pins (cat. #14 W 0145), from Ward's Natural Science Establishment, Inc., P. O. Box 1749, Monterey, Cal. 93942. These pins are also ideal for helping with emergency field repairs, since they are .008" in diameter with a very fine tapered point which will pin through even rib wood without splitting.

### Hot Wire Microfilm Trimmer

In the Sept. '66 INAV, there appeared a sketch of a hand-held hot wire microfilm trimmer designed by Bill Bigge. It used a "C" size flashlight battery for power and wire between .001" and .006" in diameter as heater. This type of device is very portable, but slightly fragile at the cutting tip due to the fine wire. Bob Dunham has suggested that a glow plug filament would do well, and made a device like that shown below. The glow plug was mounted on a sharpened dowel with the filament pulled out to a point as shown. He found that a weak 1 1/2 volt battery (telephone battery or equivalent) gave the proper heat for efficient cutting, while a new battery got the filament so hot that the wire made a wide cut. Perhaps a single cell Ni-Cad battery would be ideal?

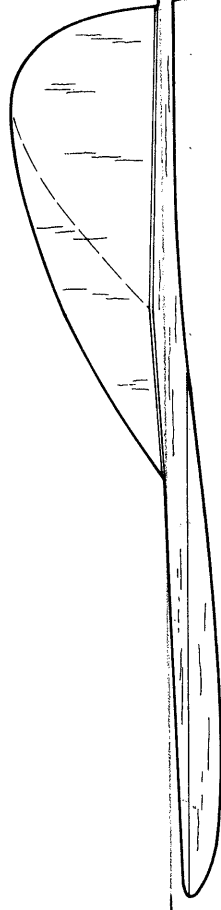


April 72



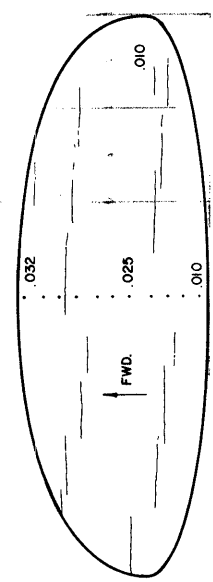
CUT HALF THROUGH WING AND  
BREAK IN 3/32" UNDERCAMBER.  
USE WHITE GLUE IN THE BREAK  
AND UNDERNEATH.

NOTE: WING HALVES ARE NOT IDENTICAL



FUSELAGE IS VERY HARD STOCK

WEIGHT 3.83 gm. OR .135oz.



STAB. ULTRA-LIGHT 'C' GRAIN



# BOXY 3

INDOOR HANDLAUNCH  
DESIGNED BY LARRY RENGER  
11-13-70

Handwritten notes on the right margin, including a date 'April 72' and other illegible text.

STATE OF THE ART

This month's plan is of Larry Renger's "Boxy 3". The Original "Boxy" appeared several years ago, after winning a local meet within hours of its conception. Boxy 3 was built after Larry moved to the Denver area, and won two meets there.

QUESTIONS AND ANSWERS

44. I would like to see some "rule of thumb" for variations in rubber weight and/or length as a function of air temperature, humidity, prop pitch and ceiling height.

Hal Crane offers the following comments:

High humidity hurts performance by increasing model weight; it also usually softens the motor stick so that less rubber can be carried safely.

Rubber puts out more power or will take more turns without breaking in warmer weather.

Rubber may be hard or soft (high torque/turn or low torque/turn), and may vary in quality. (Ed. note: The apparent maximum variations in pirelli are: energy storage - +15%; hardness - +25%.) These are unpredictable variables which call for advance testing before a flying session. I guess that a medium rubber (rated for both number of turns and torque output) is best for indoor. Rubber selection is most important and easy to goof on, especially without advance preparation.

The easy way to long Cat. I flights is to have the loop short - equal to the hook span before break-in. (If the loop is shorter than the hook span, it will overstress the stick.) Use a prop and wing loading combination such that a 15" loop of rubber which will take over 1600 turns will land with about 300 turns in a 20' ceiling. With a strong wing, launch torque can be 0.3 inch oz. Wind to 1600 turns, back off to 1500 turns. With a 60 rpm average, a ceiling scrubbing model would then have 20 minutes worth of turns. The 60 rpm average should be easily achieved with a large diameter, moderate pitch prop such as an 18" x 30".

That same model should make a no-touch flight of about 10 minutes by launching with 500 turns instead of 100 turns backed off. (Ed. note: For a precision method of altitude control, see "Slithery Dee" in the July '71 Model Airplane News, or "Choice of Rubber Motor For Low Ceiling Indoor", First NFFS Symposium Report.)

Again, that same model should fly about 30 minutes in Cat. III using a longer (18") loop of rubber wound to 0.5 inch oz. or more torque (launched at 0.4 to 0.5 inch oz.) and at least 1800 turns. Use a slightly lower pitch prop if needed to get 'way up. It would be desirable to have a stronger and perhaps longer motor stick for Cat. III. The wing can be lighter if no scrubbing or girder bumping is intended.

The flier should realize that launch torque may be as low as half the last meter reading if he winds on a fixed torque meter and has to release turns on both ends to attach the motor to the model. By using wire "o" rings at each end of the motor, a wound motor can be transferred to the model without loss of turns. If one "o" ring is used at the rear hook, the motor can be wound on the torque meter, turns let out to hook to the prop, then a torque reading taken just before hooking the rear "o" ring to the rear hook.

Wing loading of the model is the total weight divided by the wing area. Try to keep the model light without being too weak. Once the model is built you can vary the wing loading quite a bit by changing rubber. With a very good model the ultimate flight will come with rubber rubber weighing 1.5 times the airframe weight, which gets harder to adjust. It is more dangerous to the motor stick and to the wing during scrubbing, and much harder on the nerves! If the rubber weight equals the model weight, this provides good, and sometimes record results.

To summarize prop/rubber changes:

1. With inadequate climb, or if the model lands with too many turns, try reduced prop pitch or a shorter loop to get lower total model weight. If the rubber weight equals the model weight, change to shorter loop of wider rubber, since much lighter rubber will probably hurt performance more than the reduced weight will improve performance.
2. If the model seems overpowered, increase prop pitch, lengthen the loop, or use same length loop of smaller rubber (remember to keep rubber weight at least equal to model weight).

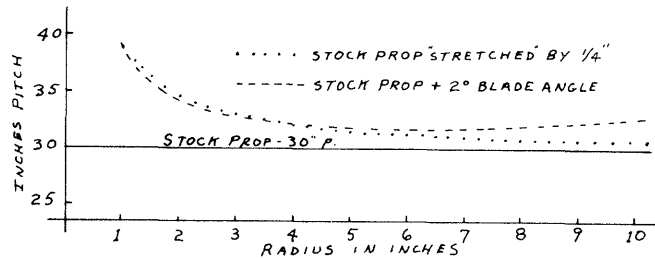
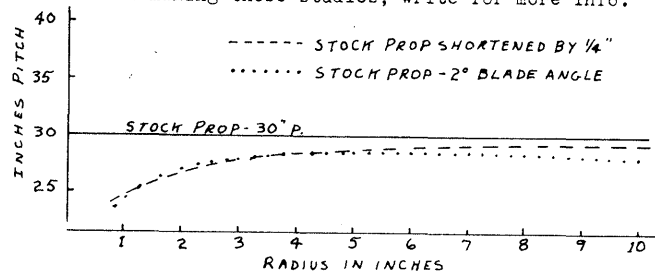
PROP FORUM

It is not uncommon for adjustable pitch props to be used on indoor models; it is even more common to tweak the blades to lower or different angles during changing flying conditions. What is not often appreciated is how drastically the pitch changes for just a small change of blade angle. Two graphs below illustrate those changes which results from change of blade angle via tweaking and also what happens if the spar is shortened or lengthened while holding the blade elements at the same angle.

The top graph illustrates the change in pitch distribution resulting from twisting the blade to a lower angle by 2° (dotted line), and the change resulting from shortening the spar on each blade by 1/4" to give 1/2" less diameter (dashed line). The solid line represents the stock prop with standard or helical pitch distribution which results from building the prop on a standard carved block.

In similar fashion, the lower graph shows the changes due to twisting in 2° more blade angle and the changes due to lengthening each blade 1/4" while keeping the blades at the same angle. Note that the dotted line and dashed line represent the opposite condition from the graph above - sorry about that!

It is easy to see that drastic changes in pitch will result from very small changes. This study is not intended to discourage tweaking, but to call attention to the need for small changes or to alert fliers to just what is happening when they tweak pitch. It is a valid and valuable technique and probably needs systematic study. It is possible to make these studies graphically, and it only takes about ten minutes per condition. If anyone is interested in making these studies, write for more info.



AIRFOILS

Ted Gonzoph offers the following information for those who use arc airfoils. The chart displays airfoil thickness and a corresponding multiplication factor to be used as follows: Wing chord x Factor = airfoil radius. As an example, 6" chord of 5.5% thickness would require 2.299 x 6 = 13.8" radius.

% Thick.	Factor	% Thick.	Factor
4.0	3.145	7.0	1.821
4.5	2.800	7.5	1.704
5.0	2.525	8.0	1.602
5.5	2.299	9.0	1.434
6.0	2.113	10.0	1.300
6.5	1.955		

Ted included the 9% and 10% figures "for the phone booth crowd" - those who fly in either very small or very low sites. He has noted (in common with others including Stan Chilton) that the thicker sections give a fantastic cruise in low ceilings, but often give difficulty in high ceilings. For another side to thick vs. thin airfoil for high ceiling flying, see DESIGN FOOTNOTES in May '71 INAV.

# INDOOR

## NEWS and VIEWS

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

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

### New Members!

Dr. JOHN B. MARTIN, 3227 Darwin St., Miami, Fla. 33133  
ALAN RICHES, 1568 Celeste Crescent, Port Coquitlam,  
B. C., Canada  
JOSE M. TELLEZ, P. O. Box 733, Laguna Beach, Cal. 92652

### Ernie Kopecky Ill

Manny Radoff has asked that friends of Ernie Kopecky drop him a line at home, as he has been sick. Ernie lives at 38 Pawn Lane, Watchung, NJ 07060, and enjoys hearing from his friends during his enforced idleness.

### '72 NATS

The 1972 Nats is back on, on the dates and schedules announced in the March '72 INAV. This information, and other pertinent info, will be repeated in the June issue. Briefly, the Indoor Nats will be on Monday, July 24 and Tuesday, July 25, 1972 at the Brig. Gen. Richard L. Jones Armory in Chicago; this was the '70 and '71 Nats site.

### Indoor Weighing Scale

Stan Chilton passes on the following: "For indoor flyers who want a professional weighing scale, I suggest an Ohaus triple beam balance Centogram scale, model CG-311. It is available through lab suppliers, school supply distributors, etc., and costs around \$30. It will weigh to within .00015 oz. accurately with repeatable readings over long periods of time, and is fast to use."

### Last Call!

Tom Vallee has announced that at least one production run of his rotary rubber shear. If anyone would like to order one (details in April '72 INAV), contact Tom very soon at 444 Henryton So., Laurel, Md. 20810.

### PennyPlane No-Touch Rule

In response to a question about background of the no-touch rule for PennyPlane, Charlie Sotich made the following remarks: "This was originally intended to make up for the differences in types of ceilings, so a building with a smooth ceiling would not give an advantage to models being flown against those in a place with a lot of girders (in postal competitions). It seems to have stuck for our Cat. I flying and got carried over to the Nats last year. At the April 21 Aeronuts meeting we voted to drop the no-touch rule for our Cat. II meets in the future."

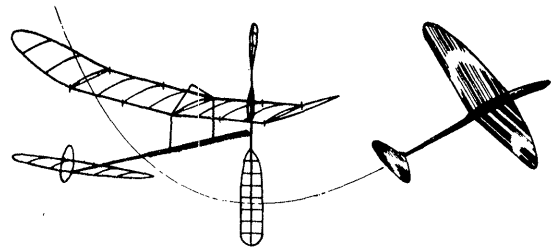
### NIMAS/NFFS Meeting

A large number of both NIMAS and NFFS members will be near Dallas during the FAI FF Team Selection Finals over 4th of July weekend. Would it be possible that an informal "bull session" type combination meeting could be held? How about all you NIMAS types dropping a card to Box 545 and telling us you are coming and what you think of this idea???

### FAI Span - Once Again

Two recent issues have noted some difficulty with the span measurement on Radoff's "Winnin' Wedge" model, due to the square tips. Subsequent remarks indirectly implied criticism of Bill Bigge, who was CD of the Eastern Finals. One of the major reasons Bill was asked to assume the job was the knowledge that he was a careful and thorough CD, with the ingrained habit of being fully cognizant of all applicable regulations. This is a habit all CD's should cultivate, along with the habit of never making a decision without consulting the current Rule Book. So, even though it came out that way, no criticism of Bill was intended and I apologize for the way it all sounded.

Now: Bill points out that Sec. 1.4.5 in the FAI Sporting Code defines wingspan as "the maximum distance between two points terminating the wing." Quite clearly, this is ambiguous enough to give rise to more than one interpretation. This weekend, during a Dist. VIII FF meeting, the matter was discussed with Murray Frank (Dist. VIII



VP) and some FAI types. Murray related having heard an interpretation of this rule to the effect that the mid-points of square tips would be the location of the points in question.

The moral of this question/mini-tempest is to not use square tips on an indoor model which will be checked to FAI specs. Ordinarily, the matter would not arise on indoor models due to the poor structural efficiency of square tips. On models with specified high wing loadings such as PennyPlane, weight penalty would be inconsequential. However, current theory indicates that a square tip is aerodynamically more efficient and may be beneficial on PennyPlane. For one gram models, it is doubtful that aerodynamic gains of a square tip would outweigh poor structural efficiency of the square tip.

### CONTEST CALENDAR

#### CANADA

Record Trials on June 4 and indoor contest July 1 in 90' AgroDome, Port Coquitlam, British Columbia. Contact Alan Riches, 1568 Celeste Crescent, Port Coquitlam, B.C., Canada for details.

#### FLORIDA - Miami

Indoor contests at 107th Ave. & Coral Way, Miami, Fla. on May 28, 1972, beginning 10 am. Paper Stick, Indoor Scale and HLG. For more details, and info on future planned meets, contact Dr. J. B. Martin, 3227 Darwin St., Miami, Fla. 33133.

#### NEW JERSEY - Lakehurst

Flying sessions at Lakehurst June 4, June 13, Aug. 6, 1972. Three day meet July 1-3, 1972 with entry fee, cash prizes. Sanctions in force for AMA, FAI Record Trials, Hangar #1. C. V. Russo, 143 Willow Way, Clark, NJ 07066.

#### OKLAHOMA - Tulsa

Indoor session (may develop into contest) in 34'11" John Mabee Gym, University of Tulsa, June 18, 1972. Contact Bob Dunham, Box 7151, Tulsa, Okla. 74105 for info.

### NIMAS POSTAL

Entry in the 1972 NIMAS Postal cannot be said to be small, as can be seen below. In fact, the 1972 entry can be equated to the entry of all previous postals combined! Many thanks for your support!

#### Junior PennyPlane

	Time	Ceiling	Fudge	Score
1. John Magnus	169 sec.	22.3'	1.253	211.7
2. Leonard Garrick	156.4	20'	1.323	156.4
3. Richard Whitten	50.2	20'	1.323	66.4

#### Senior PennyPlane

1. Doug Fronius	244	22.3'	1.253	305.7
2. Jim Haught	258.5	32'	1.046	268.3

#### Open PennyPlane

1. Hewitt Phillips	530	20'	1.323	701.2
2. Clarence Mather	391	22.3'	1.253	489.8
3. Fudo Takagi	284	22.3'	1.253	355.8
4. Howard Haupt	307	28'	1.118	343.2
5. Mike Fedor	312.4	32'	1.046	326.8
6. Frank Perkins	296.6	32'	1.046	310.2

#### Senior Indoor Stick

1. Jim Haught	335.2	32'	1.046	350.6
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#### Open Indoor Stick

1. Hal Crane	840	20'	1.323	1111.3
2. Howard Haupt	556	20'	1.323	735.6
3. Mike Fedor	490	32'	1.046	512.6
4. Mark Valerius	472	32'	1.046	493.7
5. Don Chancey	314.4	32'	1.046	328.9

#### Junior Class I HLG

1. Nigel Tarvin	45.2	20'2"	1.24	49.5
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#### Senior Class I HLG

1. Bruce Matthews	42.0	20'2"	1.24	52.0
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### Open Class I HLG

1. Don Murray	42.2	20'2"	1.24	52.3
2. Kevin Barrett	51.0	25'	1.0	51.0
3. Bob Leishman	37.6	19'	1.316	49.5
4. Leon Friedman	46.5	25'	1.0	46.5
5. Gerry Donahue	42.0	25'	1.0	42.0
6. Dick Sherman	40.0	25'	1.0	40.0

### Junior Class II HLG

1. Jimmy Clem	48.1	32'	1.094	52.6
2. Ian Yanagisawa	32.6	32'	1.094	35.7
3. Leonard Garrick	31.4	33'	1.061	33.3

### Senior Class II HLG

1. Jim Haught	48.3	32'	1.094	52.8
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### Open Class II HLG

1. Mike Fedor	74.0	32'	1.094	80.9
2. Harry Cook	55.7	27.5'	1.273	70.9
3. Don Chancey	63.0	32'	1.094	68.9
4. Tom Earle	61.4	32'	1.094	67.2
5. Dick Mathis	59.4	32'	1.094	65.0
6. Bill Langley	45.4	27.5'	1.273	57.8
7. Jim Clem	45.5	32'	1.094	49.8
8. Roger Schroeder	38.5	27.5'	1.273	48.0

### Ceiling Dodger

1. Hal Crane	630	20'	1.323	833.5
2. Stan Chilton	680.8	31'	1.063	723.7
3. Bill Langley	421	27.5'	1.128	474.8
4. Roger Schroeder	323	27.5'	1.128	364.3
5. Kevin Wehner	294	27.5'	1.128	331.6
6. Walter Lounsbury	271	27.5'	1.128	305.7

### Junior Easy B

1. Jimmy Clem	329	32'	1.046	344.1
2. Peter Sandburn	265	26'	1.16	331.0
3. Mark Killgo	160	32'	1.046	167.4
4. Leonard Garrick	110.2	20'	1.323	145.9
5. Richard Whitten	103.4	20'	1.323	136.8
6. Allen Crane	16.0	20'	1.323	21.2

### Senior Easy B

1. Kevin Wehner	323.5	20.5'	1.306	422.5
2. Jim Haught	327.9	32'	1.046	343.0

### Open Easy B

1. Clarence Mather	636	22.3'	1.253	796.9
2. Dick Hardcastle	707	31'	1.063	751.5
3. Ted Gonzoph	626	26'	1.16	726.6
4. Stan Chilton	540	20'	1.323	714.4
5. Bob Platt	529	20'	1.323	699.8
6. Bill Langley	491	20.5'	1.306	641.7
7. Dick Starks	451	20.5'	1.306	599.0
8. Gordon Wisniewski	480.2	20'	1.323	555.9
9. Hal Crane	411	20'	1.323	543.7
10. Phil Rennaker	407	20.5'	1.306	531.5
11. Fudo Takagi	393	22.3'	1.253	492.4
12. Mark Valerius	453.3	32'	1.046	474.2
13. Harry Cook	354	20.5'	1.306	462.0
14. Alan Riches	342	20'2"	1.315	449.7
15. Mike Fedor	415.2	32'	1.046	434.3
16. Walt Winberg	325.2	20'2"	1.315	427.6
17. Bob Leishman	306	19'	1.353	414.0
18. Bud Tenny	385.4	32'	1.046	403.1
19. Don Chancey	384.6	32'	1.046	402.3
20. Charles Learoyd	327.5	25'	1.183	387.4
21. Dick Sherman	301	25'	1.183	356.1
22. Howard Haupt	266	20'	1.323	351.9
23. Jim Clem	338.4	32'	1.046	342.9
24. Leon Friedman	260	25'	1.183	307.6
25. Gerry Donahue	229.4	25'	1.183	271.4
26. Kevin Barrett	160	25'	1.183	189.3

### STATE OF THE ART

This month's model was chosen not so much for its performance as for the concept and its performance vs. weight and future potential. Who else has done nearly 24 minutes with a 65 cm model weighing nearly 3 grams? John Kukon and Doug McLean collaborated on the design of a tandem FAI model, the prototype of which is shown here.

John says the following about the design: "Much of the theory of this design was worked out by a friend, Doug McLean. I've built 14 of these models and together we've flown them during the winter in a local gym. I've done the equivalent of 34 minutes on many occasions during simulated high ceiling flights. The simulation consists of using 1/8 of a normal loop of rubber along with a spacer weighing 7/8 of the loop, keeping the hook spacing exactly 1/8 of the total spacing. This gives the model full flying weight for all tests, and the stick can be given full load tests. The lightest model yielding 34 minute simulated flights weighed .049 oz. My .037 oz. version needs a different prop setup to get a higher climb, but the cruise is fantastic!

My biggest problem to date is to get the weight down to .035 oz. and still have a reasonably sturdy machine. Second, the long motor stick seems to show some torsional flex which changes the relative tilt between the lifting surfaces. The circle is large at launch and tightens as torque goes down.

Doug and I also built PennyPlane versions of this design for the November '71 contest in Philadelphia. We built identical models to the Chicago Aeronauts rules and entered the contest. Our times were 12:02 and 11:57 for 1st and 2nd under the 80' ceiling, without touching."

The usual CMOS diagram has not been included with the three-view, due to an unresolved question on the manner of applying CMOS to a tandem configuration. If the CMOS method is applied with the assumption that it is directly applicable to this model, John's trim of this model computes to +62% static margin. This would indicate that the model would have adequate stability with the front wing even further forward in relation to the CG, or that the model as shown is super-stable.

### NEWS FROM AROUND THE WORLD

#### CZECHOSLOVAKIA

The last two national Czech meets were not reported (see Sept. '71 INAV for results of July 10-11 meet; the Czech '72 Team selection was made on the basis of performance of these three meets. The finals scores below are the total of the two best times of three for each flier.)

#### National Meet in Z Hall, Brno, July 17-18, 1972

1. Rudolf Cerny	27:15	23:43	50:58
2. Dagmar Chlubna	22:59	26:40	49:39
3. Eduard Chlubny	22:47	22:53	45:40
4. Jan Hrdlicka	22:50	18:26	41:16
5. Jaroslav Jirasky	19:12	20:50	40:02
6. Tom Weigert	17:35	18:37	36:12
7. Jiri Kalina	21:30	13:53	35:23

#### National Meet in Z Hall, Brno, October 30-31, 1972

1. Jiri Kalina	29:40	30:50	60:30
2. Dagmar Chlubna	28:50	29:51	58:41
3. Eduard Chlubny	28:38	25:15	53:53
4. Karol Rybecky	29:56	22:53	52:49
5. Rudolf Cerny	23:36	25:17	48:53
6. Jaroslav Jirasky	22:05	20:45	42:50

#### Final Results, Czechoslovakia Championship for 1971

(First three placings constitute Czech Team for 1972)

1. Jiri Kalina	67:25	60:30	127:55
2. Dagmar Chlubna	55:21	58:41	114:02
3. Eduard Chlubny	58:44	53:53	112:37
4. Rudolf Cerny	55:51	50:58	106:49
5. Karol Rybecky	49:01	52:49	101:50
6. Jaroslav Jirasky	58:07	42:50	100:57

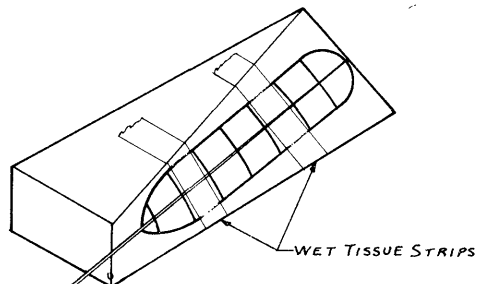
#### ENGLAND

Eight Cardington meetings were held in 1971, with about 12 regular fliers and not many of the formerly well known English indoor fliers having built one gram models. Four of these fliers have topped 30 minutes with one gram models: John Blount - 32:57, Martin Shepherd - 32:28, Bruce Edwards - 31:38 and Laurie Barr - 30:10. Winter flying has been done in a 300' x 190' x 17' RAF hangar, with over 10 minute FAI flights being made in poor conditions. A 36' hangar is also expected to be available.

#### HINTS AND KINKS

##### Prop Blade Holder

When reworking old prop blades or while building new ones, it is sometimes beneficial to wet the blade and then, bake it in the oven while holding it flat against the prop block. However, the blade is fragile and hard to hold down safely. Dick Ganslen suggests that strips of Jap tissue be stuck to the block and then water-shrunk before the block is baked. The blade will be held firmly in place without damage.



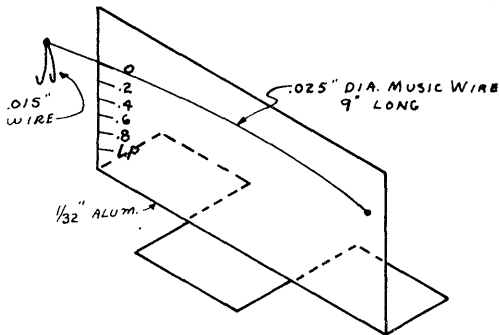




## HINTS AND KINKS

### PennyPlane Scale

Dennis Jaecks quoted his PennyPlane model weights in fractions of a "penny" weight (see Dec. '71 INAV). The sketch below shows how these weights were measured - on a scale calibrated in one penny full scale, of course! The scale was formed from 1/32" aluminum sheet with feet bent at right angles to the main body - which is a neat way to make a scale regardless of which units it works with.



PENNY PLANE SCALE

### THE LAB

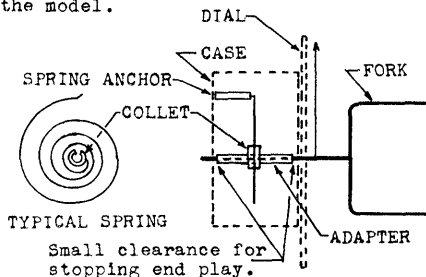
#### Launch Torque Meter

The Dec. '68 INAV presented a torque meter to be used as a winding stooage and for checking torque curves of rubber motors under test or evaluation. If you use an "0" ring at the torque meter end, that type can be used as a rough check of torque that you launch with. For low ceiling flying, the launch torque determines very closely how high the model will climb. (See "THE LAB", May '68 INAV and "CHOICE OF RUBBER MOTOR FOR LOW CEILING INDOOR", p. 78 of the 1968 NFFS SYMPOSIUM REPORT.)

If you lose any turns hooking up after winding, or wait very long to launch, the torque level will change. Also, it is very difficult to hit a desired launch torque exactly while winding on a torque stooage. The answer to all these objections and problems is to measure the torque just before launch. If you have this capability, it is a simple matter to hook up with a higher torque than needed and let the prop run in short bursts until the torque has dropped to the exact value needed.

A hairspring of suitable strength can be used to make a torque meter to make torque measurements on the model, as shown schematically below. The particular spring used in this torque meter cost \$1 postpaid at Addison Aero Parts & Sales, P. O. Box 216, Addison, Texas 75001; order part number 671-73 Hairspring. This spring has a split collet which will need an adapter. Make the adapter to fit the collet, and drill #67 thru the center of the adapter. Press a polished piece of 1/32" music wire thru the adapter to complete the main assembly. The case was made from 1/8" x 1/2" pine strips set on edge and covered with .020" aluminum to form a box. The only bearing necessary is to drill the case sides to fit the 1/32" music wire. Anchor the free end of the spring to the case, and assemble the case to the frame with small screws. Calibrate the unit in the same manner as for the meter in Dec. '68 INAV.

How do you use this device safely? Hold the model by the front wing socket (thumb and index finger of right hand) with the prop spinning free. Engage the fork with the prop spar, which stops the prop. Read the torque and launch the model.



(Reprinted from April '69 INAV)

## CONTEST RESULTS

### McDONNELL-DOUGLAS MID-AMERICA INDOOR FLYING CIRCUS

East St. Louis Armory, March 5, 1972, 34' AMA, 31' FAI

#### ROG Stick - (JSO)

1. Tony Schott	5:18
2. Jeff Hardcastle	5:04
3. Charlie Sotich	4:32

#### Indoor Scale - (JSO)

1. F. T. Stark	139 pts.
2. Charlie Sotich	138
3. Art Biehl	111.5
4. C. A. Cook	106.2

#### Open Easy B

1. Dick Hardcastle	11:47
2. Stan Chilton	11:20
3. Jim Bennett	9:05
4. Tony Schott	7:10
5. Paul Tryon	6:55

#### Jr.-Sr. Easy B

1. Jeff Hardcastle	7:03
2. Doug DePaul	4:06
3. Karl Crosby	3:07

#### Indoor Stick - (JSO)

1. Paul Tryon	11:07
2. John English	11:02
3. Dick Hardcastle	10:53
4. Tony Schott	10:19
5. M. DePaul	4:44

#### Peanut Scale - (JSO)

1. Charlie Sotich	6:24
2. F. T. Stark	3:26
3. C. A. Cook	1:49
4. A. D. Coe	1:02

#### Open HLG

1. Bob Klipp	1:02
2. Paul Tryon	1:01
3. Charlie Sotich	1:00
4. Tony Schott	0:52

#### Ornithopter - (JSO)

1. Doug DePaul	0:51
2. Bob Rother	0:50

#### Junior HLG

1. Jeff Hardcastle	0:51
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#### Category High Time

#### Rubber - Dick Hardcastle

#### HLG - Bob Klipp

#### Indoor Scale - c. Sotich

### CHICAGO AERONAUTS INDOOR CONTEST, Mar. 26, 1972 Cat. II

Brig. Gen. Armory, Chicago; 87' ceiling.

#### Jr. Class A HLG

1. Fritz Kurth	1:27.6
2. Keith Gordey	1:12.6
3. Rich Jaros	1:00.0
4. Tim Parker	0:49.3
5. Scott Wisniewski	0:36.0

#### Open Class A HLG

1. Bob Watson	1:33.9
2. Mark Kummerow	1:21.2
3. Gordon Wisniewski	1:12.4
4. Jeff Annis	1:09.8
5. Dick Swenson	1:08.8

#### Jr. AMA HLG

1. Keith Gordey	1:21.0
2. Steve Rak	1:15.8
3. Rich Jaros	0:54.3
4. James Loribecki	0:41.5
5. Bruce Bandt	0:38.8

#### Open AMA HLG

1. Richard Hixon	2:01.6
2. Bob Watson	1:48.5
3. Chuck Markos	1:47.9
4. Dick Swenson	1:43.0
5. Bob Johnson	1:30.0

#### Junior PennyPlane

1. Keith Gordey	6:51.2
2. Tim Parker	5:57.8
3. Scott Wisniewski	3:54.5
4. Rich Jaros	0:08.2

#### Open PennyPlane

1. Dennis Jaecks	9:55.6
2. Robert Hayes, Sr.	8:51.2
3. Chuck Markos	8:22.5
4. Mark Kummerow	7:03.0
5. Otto Curth	6:30.0

#### Junior Paper Stick

1. Scott Wisniewski	10:03.8
2. Fritz Curth	6:57.8
3. Kieith Gordey	5:04.0
4. Rich Jaros	1:20.2

#### Open Paper Stick

1. Dennis Jaecks	15:07.2
2. Gordon Wisniewski	14:07.0
3. Howard Haupt	12:32.8
4. Charlie Sotich	11:44.8
5. George Bucic, Jr.	10:43.5

### TECH MODEL AIRCRAFTERS INDOOR MEET, Apr. 8, 1972, Cat. II

M.I.T. Armory - 42' ceiling (AMA)

#### Indoor Scale - (JSO)

1. Chet Bokowski	137.5
2. J. G. Paillet	
3. Barry Paillet	
4. Bruce Paillet	
5. Fred Hall	

#### Delta Dart - Junior

1. Mike Roby	1:21.0
2. Dan Aggers	1:12.0
3. Susan Nichols	0:43.5
4. Juli Hall	0:42.6
5. Barry Paillet	0:35.9

#### Jr.-Sr. HLG

1. Bruce Paillet	1:05.3
2. Barry Paillet	1:00.8
3. Ron Stransky	0:58.6
4. Dan Aggers	0:51.6
5. Graham Eacock	0:13.2

#### Open HLG

1. Dick Sherman	1:05.5
2. J. G. Paillet	1:01.4
3. Ed Cattey	0:58.3
4. Gerald Donahue	0:56.4
5. Robert Nichols	0:55.3

#### Indoor Stick - (JSO)

1. Ron Stransky	8:31.2
2. Chet Bukowsky	8:04.8
3. Dick Sherman	7:46.8
4. Dan Aggers	6:10.2
5. Don Jeter	5:12.0

# INDOOR

## NEWS and VIEWS

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

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

### New Members!

OTTO CURTH, 2107 Center, Northbrook, Ill. 60062  
JAMES P. SULLIVAN, P. O. Box 91781, Los Angeles, CA 90009

### Family Memberships

FRITZ CURTH, 2107 Center, Northbrook, Ill. 60062

### '72 Nats

As announced in the May '72 INAV, the U.S. Navy has agreed to host the Nats one more time. AMA President John Clemens has set the theme as "Thanks, Navy!", and this is truly an historic event. Without the Navy, the character of the Nats will of necessity change somewhat, but there will be more Nats. If you haven't written a letter of thanks to the Navy (see Apr. '72 INAV), now is not too late. We owe the Navy more than most fliers realize.

The Nats Indoor site is the Brig. Gen. Richard L. Jones Armory; 5200 S. Cottage Grove Ave., Chicago. This is the same site as for 1970 and 1971. HLG will be 9 am to 3 pm, Monday, July 24; Indoor Scale will follow, 3 pm to 9 pm. On Tuesday, July 25, all Indoor Rubber events will be held from 9 am to 9 pm. Three unofficial events, PennyPlane, Peanut Scale and Navy Scale will be held from 3 pm to 9 pm, July 24, sharing air space with Indoor Scale models as in previous years.

All indoor HLG fliers should note that the time-sharing approach will be used again this year. This means that alternate periods of test flying and official flying will be enforced. The goal is to allow only those launching official flights on the floor during official flying periods to minimize turbulence for the gliders during the crucial touchdown phase of the flight. Note that official flights may be made during test flying sessions at the option of the contestant - but no testing during official flight sessions.

### Nats - Help!

Nats Free Flight Category Director Pete Sotich recently circulated a memo indicating manpower requirements for free flight events at the Nats. The Navy will furnish no manpower, so timing and officiating will have to be 100% AMA effort. For example, the list totals 85 bodies, exclusive of directors of individual events, for both indoor and outdoor events. That does not include indoor scale, since this category is staffed totally by the Detroit Cloud Busters, Inc.

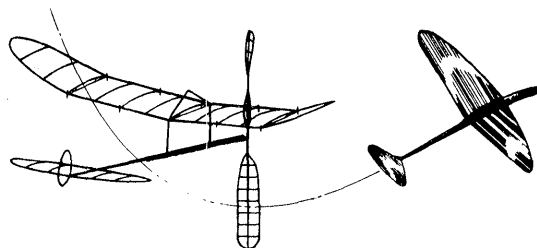
Indoor events customarily have only two co-directors who handle all four "standard" indoor events (PennyPlane and Scale events handled separately), and outdoor FF event direction is often handled by the same few men who work the whole meet. Recorders and processors are usually the same crew all week. The major manpower squeeze will be on flight timers, and it is expected that everyone except perhaps Juniors will have to participate in a strict time-a-flight-fly-a-flight procedure on a one-for-one basis. That is, no individual will be permitted to time an excess of flights and "coast" the rest of the day.

All the above leads to this: if your flying schedule will permit, please volunteer to help where you can. Send your name and open schedule to Pete Sotich, 3851 West 62nd Place, Chicago, Ill. 60629 immediately!

### NFFS Top Ten Model Winners

The National Free Flight Society announces the recipients of its ten FF Model of the Year awards for 1972:

<u>Event</u>	<u>Flier</u>	<u>Model Name</u>
1/4 A Gas	Vic Cunyningham, Jr.	Geodetic Galaxie
ABC Gas	George Fuller (England)	Dixielander
FAI Power	Thomas Koster (Denmark)	Andromeda
Wakefield	C. Schwartzbach (Denmark)	Little Big Horn
A/2 Nordic	Hugh Langevin	Osprey
Indoor	Joe Bilgri	(See Feb.'72 INAV)
HLG	Dick Mathis & M & P	Flash



### Special Classes

PennyPlane- Erwin Rodemsky  
Outdoor Scale, Gas - Leoning M-8

### Recent Publications

Indoor fliers continue to owe a word of thanks to MAN magazine for giving Indoor topics more coverage than any other magazine: a report of the East Coast Team Finals (Feb. '72), Tom Vallee's "Forum" in June '72 and "For Two Cents" (July '72). "For Two Cents" is an excellent bit on PennyPlane by Clarence Mather and Dave Linstrum with full-size plans of two models made available. Tom's Forum topic is an analysis of the aftermath of weight rules for FAI Indoor. Not everyone will agree with his conclusions, but the arguments are well organized and presented.

### NIMAS/NFFS Meeting

Only a few responses (all favorable) were received to last month's query about a possible joint meeting of NIMAS and NFFS members attending the FAI Team Selection Finals in Caddo Mills, Texas. Due to the less-than-overwhelming response, we'll have to play it by ear. I'll look forward to seeing all who come, as I will be helping time July 1 and July 2 (have to work July 3). Y'all come!

### FAI INDOOR REPORT

#### Joe Bilgri Resigns

Citing only personal reasons, Joe Bilgri has resigned his position on the U. S. Indoor Team. Joe is an experienced flier who will be missed, both by the Team and by his many friends overseas. We wish him the best of luck and a speedy return to his normal activity.

Sal Cannizzo will be the new member of the Team, following his photo-finish in the East Coast Finals last year (Sal missed the Team then by .07 percentage points). He is a relative newcomer to FAI Indoor, but never placed lower than 2nd place and never lower than 91% of the winning score during the Team Selection Program.

#### FAI Document Appears

Beginning on p. 105 of the July '72 AAM, the long-awaited "FAI Document" has been published. Thousands of words detail past history and present practice in general terms, plus explaining much about FAI procedures. It can be regarded as an excellent document to acquaint newcomers with the general "facts of life" about FAI programs.

However, it has been noted that a desperate need exists for detailed listing of program administrator duties and authority. No mention is made of who can override bad decisions by administrators, what channel of appeal can be used by program participants, etc. In short, nothing whatsoever appears in this document to answer the appeal made by numerous fliers for a definitive document. It might be noted that this document has been made up and published without either guidance or review by the AMA Executive Council (see Executive Council "Bombs Out", Mar. '72 INAV). Now that the "document" has appeared, it is inescapable that it contains nothing which would have served as guidance to either side during the controversy which almost scuttled the 1971 Team Selection Program.

Time has slipped by so fast that we are in danger of not having a 1974 Indoor Team. The deficiencies of "the document" make it impossible for any program administrator to function; he will have no assurance of freedom from capricious and bungling interference by "authorities" with undefined responsibility and authority. Even if deficiencies in the document were addressed immediately, the work of Nats preparation and other pressing AMA business would prevent an early solution. In view of recently-decided requirements for program details to be settled by polling expected participants, it is already too late to make any effective program preparation to complete team selection before late in 1973. The matter should have been settled and an administrator appointed no later than May 1, 1972.

**CONTEST CALENDAR**

**CALIFORNIA - Santa Ana**

Record Trials at Santa Ana MCAF on July 23, 1972 and Aug. 12-13, 1972. Bob Gibbs, 5005 Halifax Circle, Cypress CA 90630.

**CANADA**

Indoor contest in 90' Agrodome in Port Coquitlam, B.C. Contact Alan Riches, 1568 Celeste Crescent, Port Coquitlam, B. C., Canada for details.

**FLORIDA - Miami**

Indoor contests planned during summer in Miami - contact Dr. J. B. Martin, 3227 Darwin St., Miami, Fla. 33133.

**GEORGIA - Albany**

Easy B, HLG, Indoor Scale, Paper Stick contest as part of Georgia State Championships, held at NAS Albany on July 1-2, 1972. Indoor to be 7:30 pm to 11 pm in a navy hangar with 28' 6" to first obstruction. Contact Bob Stevenson, 209 Sourwood Dr., Marietta, Ga. 30060 for info.

**NEW JERSEY - Lakehurst**

Indoor meet July 1-2, 1972 (not including July 3 as originally announced) in Hangar #1. Entry fee will be charged and cash prizes awarded for events chosen. Sanctioned for AMA and FAI Record Trials. C. V. Russo, 143 Willow Way, Clark, NJ 07066.

**TOP TEN EASY B**

The Top Ten Easy B listing begins anew each year with the winners of that year's NIMAS Postal (see May '72 INAV for that listing). From that time until the next Postal, additional flights can be submitted which will "bump" into the Top Ten listing. This has happened early this year - the listing below represents the latest standings as Dick Hardcastle bumped into first place and Jim Bennett bumped into the Top Ten.

	Time	Ceiling	Fudge	Score
1. Dick Hardcastle	585	18'	1.394	815.5
2. Clarence Mather	636	22.3'	1.253	796.9
3. Ted Gonzoph	626	26'	1.16	726.6
4. Stan Chilton	540	20'	1.323	714.4
5. Bob Platt	529	20'	1.323	699.8
6. Bill Langley	491	20.5'	1.306	641.7
7. Dick Starks	451	20.5'	1.306	599.0
8. Jim Bennett	545	31'	1.063	578.3
9. Gordon Wisniewski	480.2	20'	1.323	555.9
10. Hal Crane	411	20'	1.323	543.7

**TOP TEN CEILING DODGERS**

The Top Ten Ceiling Dodgers listing has been continued uninterrupted, rather than being renewed after each Postal meet. This is due to the lower participation in this fascinating but technically more difficult event. The listing below has been updated to include results from the '72 NIMAS Postal.

	Time	Ceiling	Fudge	Score
1. Stan Chilton	1115	35'	1.0	1115
2. Tom Vallee	810	20'	1.323	1071.6
3. Hal Crane	682	20'	1.323	902.3
4. Dick Hardcastle	602	23'	1.234	742.9
5. Hewitt Phillips	528.2	20'	1.323	698.8
6. Howard Haupt	456	22'	1.261	574.5
7. Harry Cook	471	26'	1.16	546.4
8. Bill Langley	421	27.5'	1.128	474.8
9. Jim Davidson	280	13'	1.64	459.2
10. Roger Schroeder	239.5	15'	1.527	365.7

**RECORDS? MAYBE!**

SANTA ANA RECORD TRIALS - May 14, 1972, Cat. III Santa Ana Hangars, Santa Ana MCAF, Calif.

Jr. Cat. III HLG - 1:39.2, Dennis Cunningham Sr. Cat. III HLG - 2:13.5, Marty Thompson

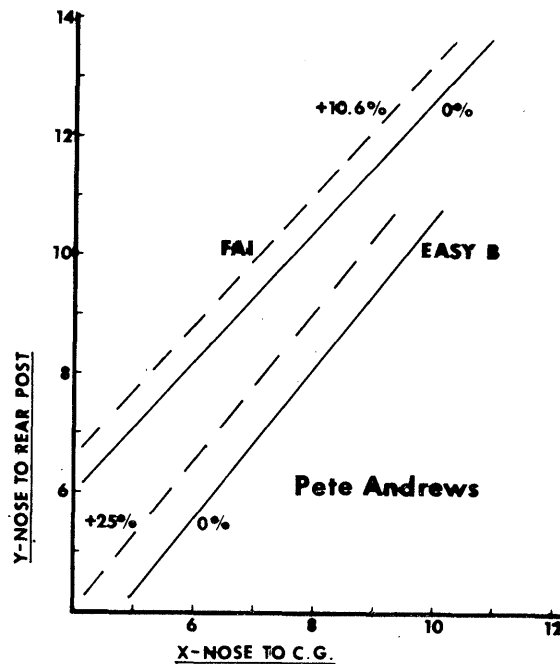
SANTA ANA RECORD TRIALS - June 11, 1972, Cat. III Santa Ana Hangars, Santa Ana MCAF, Calif.

Open Cat. III Cabin - 29:46, Bob Randolph  
BRAINBUSTER'S RECORD TRIALS - May 20, 1972, Cat. I Willis School, Hampton, Va. 20' ceiling  
Open AMA Cat. I FAI - 20:19, Bob Platt

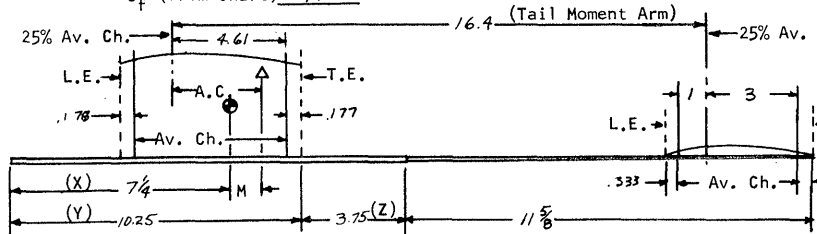
**STATE OF THE ART**

This issue must be a Pete Andrews "special" - with a three view of Pete's Easy B and info below on one of the FAI's he flew last year. Pete's model designs are worked out on his programmable desk calculator, using CMOS design methods. The Easy B reached what may be an all-time high time for Easy B - 17:10 (flight in Lakehurst). It also won 1st at the only indoor meet it was entered in - the LIAMAC meet at Cantiague Park on April 30, 1972.

The diagram below, with dimensions from Pete's FAI, is the top of the standard CMOS computation form. Forms are available on request (self-addressed envelope), and an instruction packet on CMOS is also available. Beside the diagram is a compilation of pertinent dimensions of the model. The CMOS diagram below has balance info on both models, with the dashed line showing Pete's balance point and the solid line being the 0% balance line which is the most sensitive balance setup recommended for all-purpose models. More sensitive setups are possible, and probably well worth using for record trial/ideal weather flying.



MODEL SPECS: Wing Span 25.6 Wing Area 157.33 Av. Chord 6.145 Aspect Ratio 4.165:1  
Stab span 14 Stab area 56 Av. chord 4 Aspect ratio 3.5:1  
C<sub>f</sub> (from chart) .417



**ANDREWS 1971 FAI**

Wing span	25.6"	Stab span	14"
Wing chord	6.5"	Stab chord	5"
(straight wing with round wing tips)		(stab is 1/3-2/3 double parabola)	
Wing area	157.33 sq. in.	Stab area	56 sq. in.
Average chord	6.145"	Average chord	4"
Aspect ratio	4.165:1	Aspect ratio	3.5:1
Airfoil - Kowalski 7%		Airfoil - 540	
Dihedral 3" each tip		Prop 17 x 30, 2" wide at maximum width	
Rubber .051 x .043 x 17			
Rudder 2 1/2 x 4 1/2			



By Erv Rodemsky

Since I am one of the "bad guys" who pushed for a weight rule in FAI Indoor, I would like to rebut Tom Vallee's criticism published in MAN Forum.

I do agree with his comment that the rule was hastily and poorly written. The reason was for simplicity. All rule changes are unpopular with "experts" who are winning under the old rules; invariably these changes bring out creative thinking and new participants. (The reduction of wingspan from 90 cm to 65 cm gave us World Champion Jim Richmond.) Ed note: don't forget Jiri Kalina!

So, in attempting to keep it simple (an excellent principle), the rules writers did not go far enough. The intent of the one gram rule was to increase the strength of indoor models. That goal could have been better accomplished by limiting wing and tail area along with requiring one gram weight. Cutting performance can be accomplished by limiting the weight of rubber (perhaps one-half gram). "It puts too much premium on good rubber," they scream. If a competitor doesn't know how important good rubber is now, he's not paying attention!

Tom blames the lack of balloons for problems in Romania. This is a half truth. Balloons would have been invaluable in retrieving, but can you imagine "steering" a 26" span, transparent model, 180' high in a dark, drafty salt mine? If you want to reduce hang-ups, stop the time as soon as the model touches anything. This will eliminate rafter-banging. I think steering should be limited to sites of less than 50' ceiling.

Tom's observations on design trends are accurate\*, but it wasn't the 10" chords, 20" props and 18" motor sticks that made the Team! All three members\*\* used relatively conventional well-trimmed models that were capable of handling large motors. No one ever said a weight rule would make a poor builder into a champion, but it sure opens the way for some original thinking as evidenced by the proliferation of new designs seen at contests. If for no other reason than encouraging some new builders to give Indoor a try, the weight rule is worth it.

Analyzing the results of contests under both sets of rules brings out one very obvious advantage of the weight rule - an equalizer. Contrary to Tom's allegations, top time was lowered; more importantly, the spread from first through fifth was much smaller. Isn't that where it's at - close competition?

In closing on a positive note (as did Tom), rule changes should be provisional before becoming final, and perhaps tried in other events such as PennyPlane.

\*Tom's article was written before the Finals; perhaps after "Salt Mine II", he might have noted a requirement for reliability under adverse conditions!

\*\*Since Bilgri's resignation (see p. 1) and his replacement by Sal Cannizzo, this statement is still true. Sal's models were even more "conventional" than the other three winners.

HINTS AND KINKS

Slick Tissue Sockets

Dick Ganslen suggests that teflon tubing can be used as a no-stick form to roll wing sockets on. Just slip the tubing over a thin wire to hold it stiff, and roll the sockets as usual. However, it is not necessary to remove the sockets before the glue dries, as the teflon is slick enough to permit the dry socket to slide off.

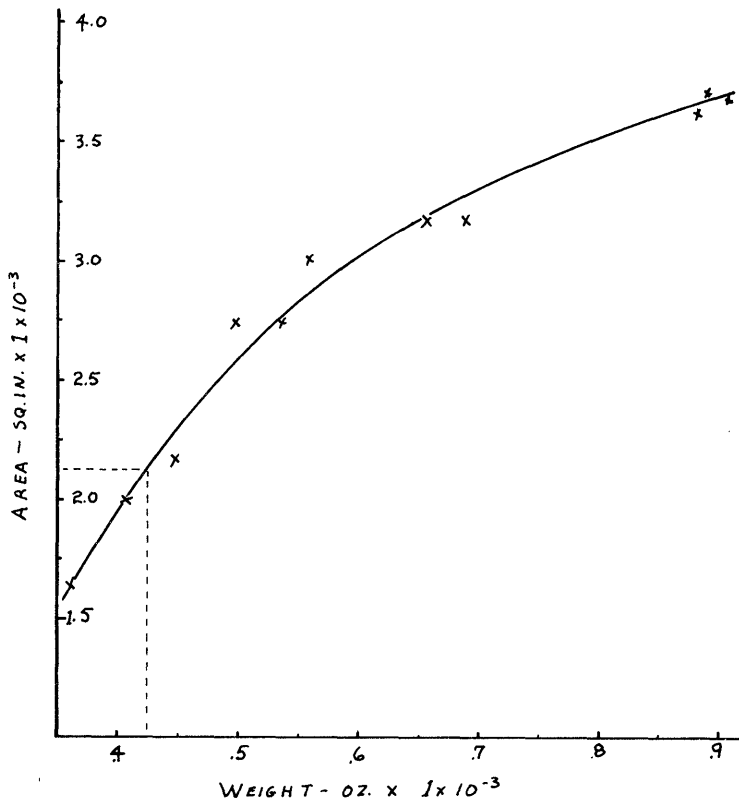
Wing Reinforcement

Bob Platt has been reinforcing his FAI wings with a length of dacron bracing glued to the leading edge and trailing edge where he makes contact with the steering pole. This is intended to hold the wing together if it breaks, thus preventing the film from tearing. In similar fashion, Bob Randolph puts dacron across the top of the spar at the dihedral break in case the spar breaks completely while he is installing the dihedral. In either case, you get two chances to fix the wing before the film gets torn; just be sure you don't have sticky film which will fold over and tear anyway!

Knot Correction Chart

In the process of making extensive torque tests on pirelli, some method of correcting for the weight of the knot was needed. The solution to the problem was to tie many standard knots in rubber, cut them loose, then weigh the knots and average the results. The graph below gives the correction at a glance. Each point on the graph is an average of at least three knots, and the accuracy of correction factors from the chart should be about 1%.

Use the graph this way: measure the rubber cross-section with standard (not spring-loaded) micrometers, and compute the area. Locate this area along the left side of the graph, move across to the graph, then down to the bottom line and read the weight of the knot. For example, .042 x .051" rubber has an area of .00213 sq.in. Following the dashed line, this equates to .000425 oz.



CONTEST RESULTS

ST. LOUIS INDOOR CHAMPIONSHIPS, Apr. 9, 1972 Cat. I  
Ft. Zumwalt High School, O'Fallon, Mo. 24' ceiling

Open Easy B		Junior Easy B	
1. Jim Bennett	7:46	1. Jeff Hardcastle	6:19
2. Tony Schott	7:29	2. Rosy Tryon	5:30
3. Stan Snyder	7:22	3. Doug DePaul	2:15
4. Jim Pears	7:03	4. Jason Tryon	1:10
5. Paul Tryon	6:25		

Open HLG		Junior HLG	
1. Dick Hardcastle	1:04	1. Rosy Tryon	0:26
2. Bob Klipp	0:56	2. Jason Tryon	0:19
3. Tony Schott	0:44		

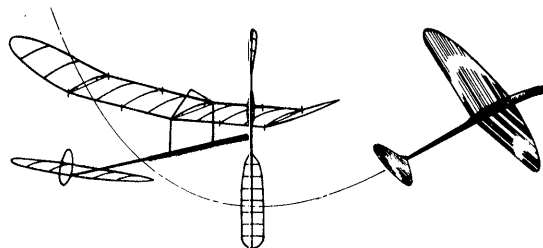
Indoor Stick		Ornithopter	
1. Dick Hardcastle	9:44	1. Bob Rother	1:00.2
2. Paul Tryon	6:46	2. Jeff Pears	0:36.6
3. Tony Schott	6:45		
4. Marion DePaul	3:47	Indoor Scale	
5. Jim Bennett	0:44	1. Art Beihl	0:43
		2. Lloyd Wood	0:27

Helicopter	
1. Jeff Pears	0:48

High Point Champion - Dick Hardcastle

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

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

\*\*\*\*NATIONAL INDOOR MODEL AIRPLANE SOCIETY\*\*\*\*New Members!

RICHARD A. McCLELLAND, 42 Maple Place, Nutley, NJ 07110

Help - Nats Report!

Much of the success of this newsletter has been due to willing help from many people. If there is any sort of Nats report beyond the "bare bones" listing of results, Nats entrants will have to help out. Due to my upcoming trip to the WCh in August, vacation time must be saved for that instead of the Nats. Therefore, any help which is available (pictures and description of what happened) will be welcome. Due to my need to mail the Aug. issue as early as possible, please try to mail text by Aug. 1, 1972, and pix as soon as possible after that. If you have a contribution that will be a little later, please drop a card saying it is coming so I can plan for it.

Free PennyPlane Kits

The Chicago Aeronuts will again furnish free PennyPlane kits for the convenience of P/P newcomers. These kits will be available at the HLG/Scale session at the Nats (Monday, July 24, 1972).

Caddo Mills Report

After the wind went away (July 6, it was calm enough to fly PennyPlane outdoors!) and the dust settled, the FAI Team Finals produced the following FF Team members:

<u>Wakefield</u>	<u>Nordic</u>	<u>Power</u>
Frank Parmenter	Hugh Langevin	Hank Spence
Bob White	Paul Crowley	Frank Wolf
Jon Davis	Vince Croghan	Tom McLaughlin

The possibility of a NFFS/NIMAS confab went by default because of repairs, searching for lost models, and general fatigue caused by long chases. Several very welcome bull sessions were had with old friends, but it was impossible to get more than a few together at any one time.

FAI INDOOR REPORTInternational Record Application

Considerable skepticism has greeted a tentative record received by FAI. C. W. Hennecart, Director General sent out copies of the application for Class F1d (Indoor Model) record, with a claimed Cat. I time of 1:58:28. No other details were available at publication time, except that the flight was claimed by Russia and the date of application was June 30, 1972.

Record WCh Entry?

A note included with AMA's request to NAA for transportation for the U. S. Indoor Team stated that thirteen (13) countries had entered the 1972 Indoor World Championships. Information available here indicates that these countries have entered: Australia (proxy entry by Boyd Felstead) to be flown by Manny Radoff with Erv Rodemsky as team manager; Czechoslovakia, England, France, Italy and Romania. In addition, Poland and Hungary are known to have teams, even though word from Hungary indicated that Hungary would not attend. Finally, Germany and Finland have never missed an Indoor WCh, and Yugoslavia has attended all since Debrecen, Hungary (1966). The other countries reported to have indoor activity at some level are: Argentina, Austria, Canada, Holland, New Zealand, Russia and Sweden.

Hopefully, information will come in regarding teams from the other countries that have entered. Meanwhile, the following fliers are members of teams from their respective countries:

<u>Czechoslovakia</u>	<u>Italy</u>
Jiri Kalina	Carlo Cotugno
Eduard Chlubny	Mascuillo Germano
Dagmar Chlubna	Frioli Adalberto

Hungary  
Andras Ree  
Buzady Gyorgy  
Antal Egri

Poland  
Ryszard Czechowsky  
Edward Ciapala  
Stefan Bombol

Romania  
Nicu Bezman  
Otto Hints  
Vasile Nicocara

CONTEST CALENDARCALIFORNIA - Santa Ana

Record Trials at Santa Ana MCAF on July 23 and Aug. 12-13, 1972. July RT - Bob Randolph, 25145 Lawton Ave., Loma Linda, CA 92354. Aug. RT - Bud Romak, 85 Sullivan Dr., Moraga, CA 94556.

NEW JERSEY -Lakehurst

Flying sessions at Lakehurst on Aug. 6, 1972. C. V. Russo, 143 Willow Way, Clark, NJ 07066.

RECORDS? MAYBE!

TULSA GLUE DOBBERS RECORD TRIALS, June 18, 1972 Cat. I John Mabee Gym, Univ. of Tulsa 34' 11" ceiling.

Open FAI Cat. II FAI - 16:45, John English  
Sr. Cat. I HLG - 1:07.1, Robert Dunham II  
Sr. Cat. I Cabin - 7:10, Robert Dunham II

NIMAS AWARDS

Gold Cat. III HLG Award - 1:06.2, Dan Domina

TOP TEN CEILING DODGERS

	Time	Ceiling	Fudge	Score
1. Stan Chilton	1115	35'	1.0	1115
2. Tom Vallee	310	20'	1.323	1071.6
3. Hal Crane	682	20'	1.323	902.3
4. Dick Hardcastle	602	23'	1.234	742.9
5. Hewitt Phillips	528.2	20'	1.323	698.8
6. Howard Haupt	456	22'	1.261	574.5
7. Harry Cook	471	26'	1.16	546.4
8. Bill Langley	421	27.5'	1.128	474.8
9. Jim Davidson	280	13'	1.64	459.2
10. Kevin Wehner	263	18'	1.394	366.6

CONTEST RESULTS

CHICAGO AERONUTS INDOOR CONTEST, Apr. 22-23, 1972 Cat. II Brig. Gen. R. L. Jones Armory, Chicago 90' ceiling

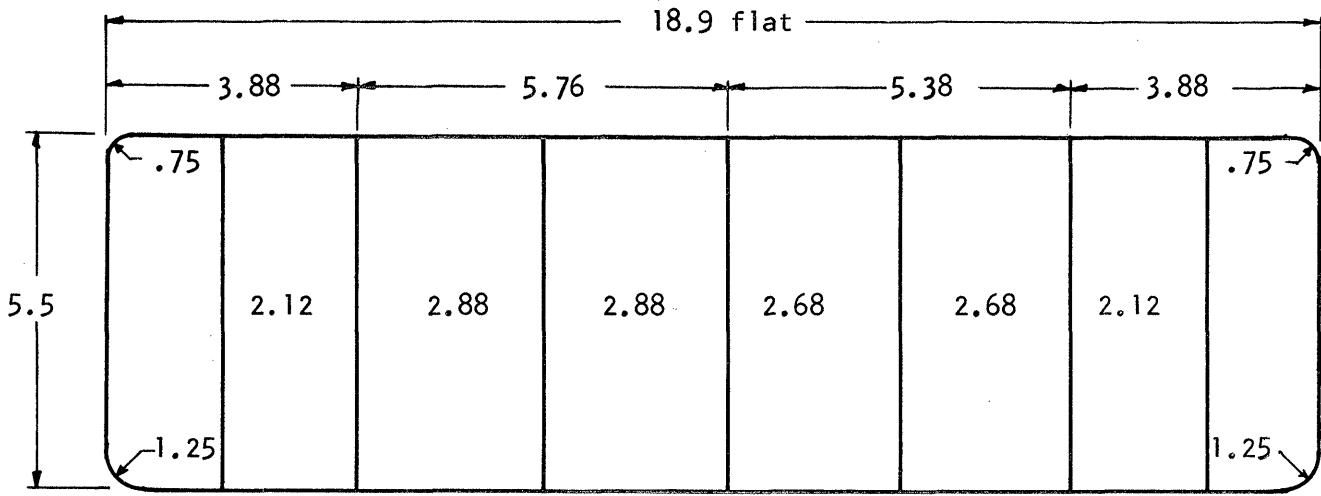
Jr. PennyPlane	Open PennyPlane		
1. Steve Oravec	5:02.0	1. Dennis Jaecks	10:05.0
2. Scott Wisniewski	4:31.5	2. Rol Anderson	9:37.6
3. Keith Gordey	3:49.8	3. Hank deKat	8:17.8
4. Eric Miller	2:54.0	4. Gordon Wisniewski	8:12.1
5. Rich Jaros	1:38.8	5. Robert Hays, Sr.	7:09.0

Jr. Paper Stick	Open Paper Stick		
1. Scott Wisniewski	9:30.8	1. Dennis Jaecks	15:33.7
2. Fritz Curth	9:03.1	2. Chuck Markos	15:07.9
3. Eric Miller	4:51.2	3. Charlie Sotich	14:40.3
4. Rich Jaros	1:58.2	4. Ed Stoll	13:13.4
		5. Gordon Wisniewski	12:09.4

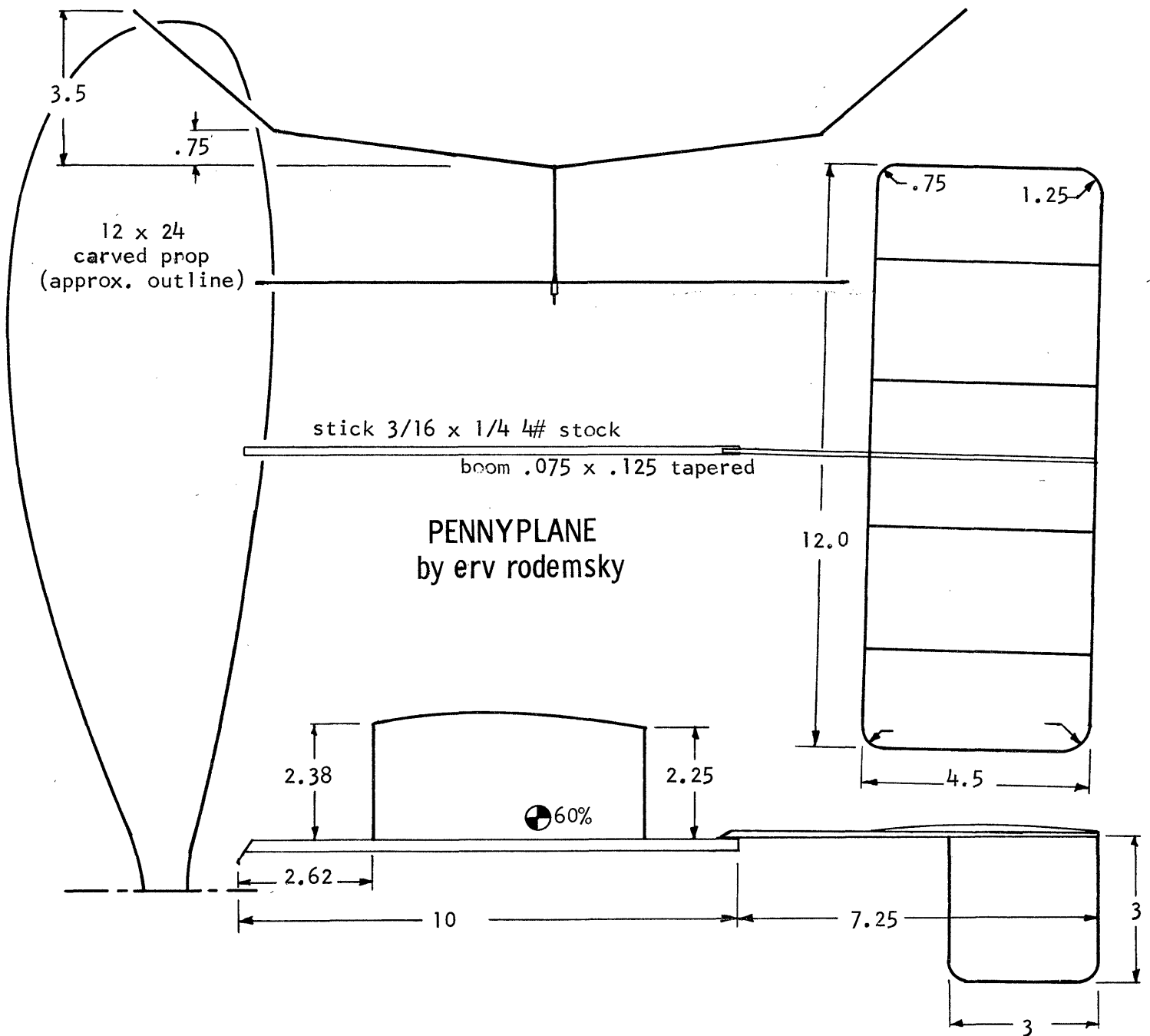
Jr. Indoor Stick	Open Indoor Stick		
1. Scott Wisniewski	8:45.8	1. Dennis Jaecks	20:29.2
2. Fritz Curth	6:32.5	2. Howard Haupt	17:04.0
3. Eric Miller	3:40.7	3. Ed Stoll	15:01.1
4. Rich Jaros	1:35.4	4. Charlie Sotich	14:14.0
5. Steve Rak	0:13.9	5. Rol Anderson	14:11.0

Jr. HLG	Open HLG		
1. Keith Gordey	110.0	1. Rick Hixon	112.8
2. Steve Rak	88.7	2. John Loribecki	111.0
3. Scott Wisniewski	81.8	3. Dick Swenson	96.0
4. Rich Jaros	72.9	4. Chuck Markos	93.4
5. Fritz Curth	33.2	5. Louie Bromley	89.0

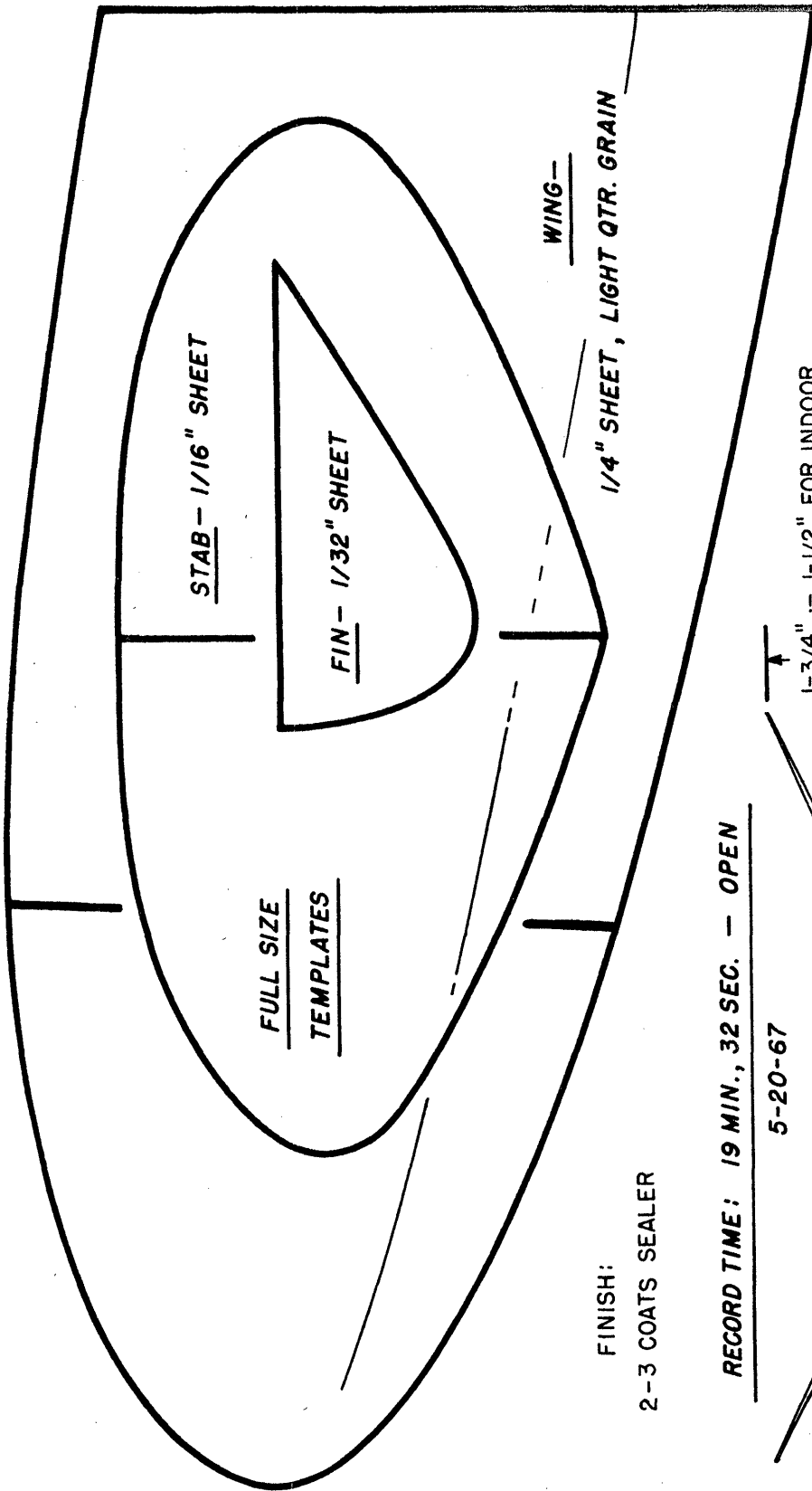
(CONT. P. 4)



wing spars 1/16 sq. tapered to .04 sq. at tip



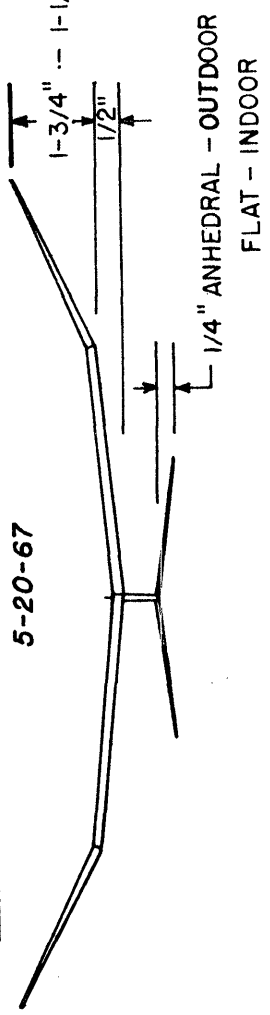




FINISH:  
2-3 COATS SEALER

RECORD TIME: 19 MIN., 32 SEC. - OPEN

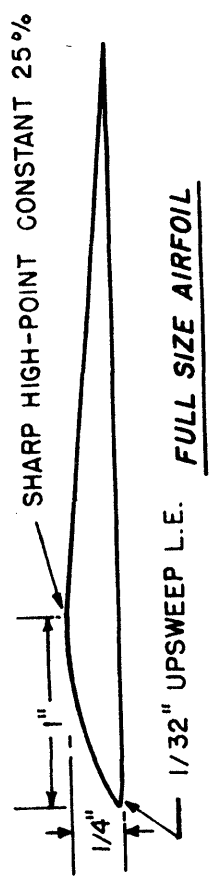
5-20-67



# TARA 18

BY

*Ron Wittman* 12-3-67  
 TRUE SPAN - 17-3/8"  
 LENGTH - 19-3/4"  
 WING AREA - 64 SQ. INS.  
 STAB AREA - 12 SQ. INS.  
 WEIGHT - 19 GRAMS



1/32" UPSWEEP L.E. FULL SIZE AIRFOIL

**STATE OF THE ART**

**Indoor Scale**

1. Jack Neiderhauser	Douglas M2	155.0
2. Mark Kummerow	1911 Cessna	149.0
3. Keith Ward	Piper Cub	147.1
4. Ron Martelet	Pilatus Porter	137.0
5. Chuck Markos	Westland Widgeon	121.0

**Plastic Prop Jr. Rubber**

1. Gregg Miller	27.9
2. Jenny Linstrum	27.3
3. Mindy Linstrum	27.2
4. Chuck Fort	25.4
5. Jim Jamrose	25.3

**ST. LOUIS GATEWAY CHAMPIONSHIPS (Indoor section) 6/3/72**  
Missouri Baptist College, St. Louis 18' ceiling

<b>Indoor Stick</b>		<b>Indoor HLG</b>	
1. Dick Hardcastle	9:45	1. Dick Hardcastle	48.0
2. Tony Schott	7:48	2. Bob Klipp	44.0
3. Jim Bennett	6:54	3. Lloyd Wood	05.0
4. Pat Wood	4:04		
5. Lloyd Wood	2:10		

**Indoor Scale**

1. Dick Hardcastle	78
2. Tom Stark	62
3. Lloyd Wood	32
4. Pat Wood	15

**NEWS FROM AROUND THE WORLD**

**ARGENTINA**

The Argentina Nats were held simultaneously with the South American Contest, which drew entries from Chile, Brazil, Uruguay, Bolivia and Peru. The scheduling of indoor for the Argentina Nats gave unprecedented opportunity for modelers from all these countries to see and admire a relatively rare type of model. Interest was very high, and the fliers from Argentina were very busy answering questions. It is possible that Indoor will become a regular event at future South American Championships; this is only one step away from the possibility of International Indoor Contests in this hemisphere. The next step may be a World Championships in this hemisphere!

The contest itself was made more difficult by uncontrollable drafts near the top of the theatre site, which caused most flights to terminate in an upper balcony.

1. Eduardo Grippo	13:12	8:52	22:04
2. Alberto Barilari	7:27	9:40	17:07
3. Nereo Begglatto	6:50	8:52	15:42
4. Luis M. Coronel	7:34	6:47	14:21
5. Miguel A. Leone	6:44	6:55	13:39
6. Julio C. Martinez	3:46	4:37	8:23
7. Domingo Sassone	0:13*	7:47*	8:00

\*Both models destroyed on only flight.

**ROMANIA**

An International Indoor Contest was held in the salt mine at Slanic-Frahova, Romania, May 5-7, 1972.

**Individual results**

1. Zoltan Oscodi	Hungary*	30:56	30:15	61:11
2. Jiri Kalina	Czechoslovakia	31:03	29:40	60:43
3. Karol Rybecky	Czechoslovakia*	29:38	29:45	59:23
4. Andras Ree	Hungary	28:38	30:42	59:20
5. Ryszard Czechowsky	Poland	28:21	30:17	58:38
6. Gyorgy Buzady	Hungary	28:31	29:58	58:29
7. Nicu Bezman	Romania A	27:06	29:05	56:11
8. Otto Hints	Romania A	27:50	28:15	56:05
9. Eduard Chlubny	Czechoslovakia	27:00	28:19	55:19
10. Vasile Nicoara	Romania A	27:07	27:06	54:13
11. Tudorel Lungu	Romania*	24:16	29:48	54:04
12. Antal Egri	Hungary	26:37	27:18	53:55
13. Dagmar Chlubna	Czechoslovakia	25:00	27:54	52:54
14. Aurel Popa	Romania B	23:25	26:11	51:36
15. Gheorghe Chinga	Romania*	26:20	24:13	50:33
16. Edward Ciapala	Poland	22:08	27:57	50:05
17. Eugen Holtier	Romania*	24:41	24:32	49:13
18. Aurel Moraru	Romania B	19:57	27:02	46:49
19. Stefan Bombol	Poland	20:41	25:09	45:50
20. Eugen Cures	Romania*	26:11	19:37	45:47
21. Karoly Biro	Hungary*	22:31	19:59	42:30
22. Stefan Botos	Romania B	16:19	22:09	38:28

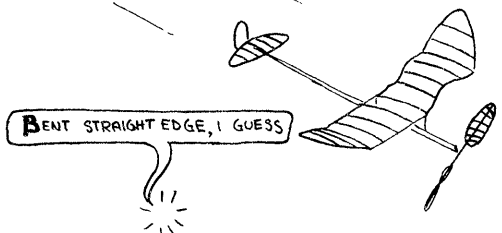
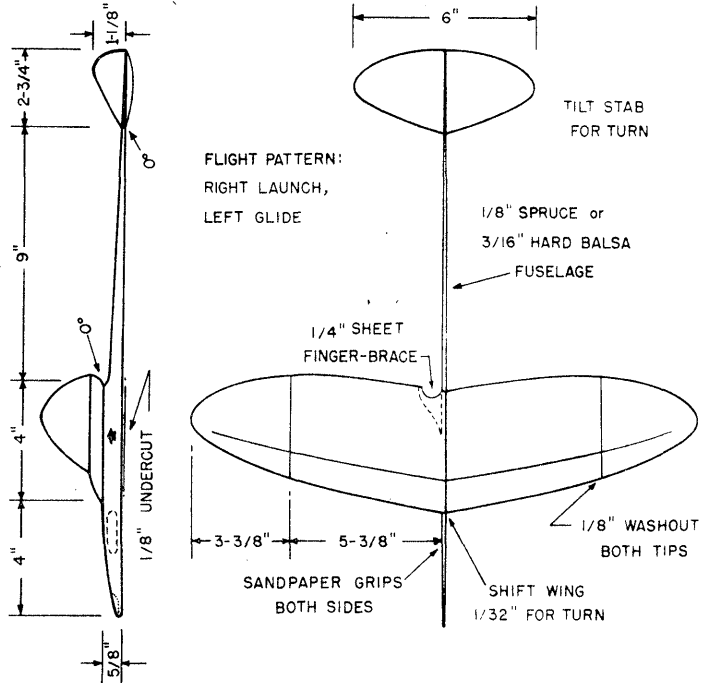
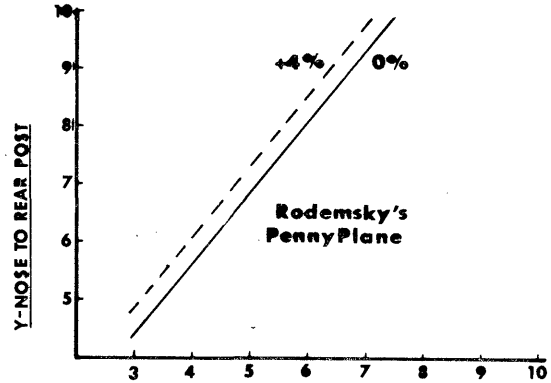
**\*Individual entrants**

**Team Results**

1. Hungary	171:44
2. Czechoslovakia	168:56
3. Romania A	166:29
4. Poland	154:33

Erv Rodemsky was honored by NFFS this year for his "invention" of the PennyPlane, along with the Chicago Aeronauts for their promotion of the model. NFFS features four PennyPlanes as examples, including Dennis'Jaecks' Nats winner (Dec. '71 INAV), models by Dave Linstrum and Clarence Mather (July '72 M.A.N.) and Rodemsky's 1¢ Plane as shown on page 2.

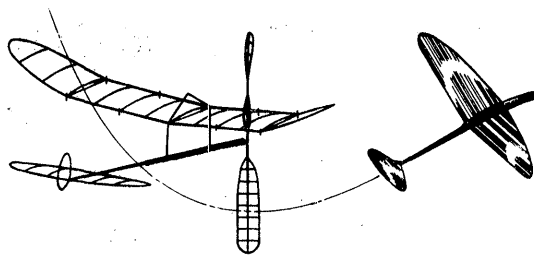
A second offering for the month is Ron Wittman's Tara 18, a glider which took several places at the 1967 Indoor Nats, and has set outdoor records as well. Full size outlines appear on page 3, with top and side views below.



PAT PERCIVAL - INDEPENDENCE, O.

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

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<u>Indoor Stick</u>		<u>Paper Stick</u>		<u>Indoor Cabin</u>		<u>Indoor HLG</u>	
<u>Junior</u>		<u>Junior</u>		<u>Junior</u>		<u>Junior</u>	
1. Gordon Clark	13:01.2	1. Scott Wisniewski	11:41.0	1. Richard Whitten	4:49.4	1. Jeffery Tillou	96.6
2. Scott Wisniewski	12:13.2	2. Bruce Pallet	10:47.0	2. William Wood, Jr.	3:46.2	2. William Schlarb	93.3
3. Jeff Hardcastle	10:43.6	3. Jimmy Clem	10:10.0	3. William Schlarb	2:59.2	3. Scott Wisniewski	86.2
4. Jimmy Clem	10:14.4	4. Jeff Hardcastle	9:56.6			4. Barry Pallet	85.8
5. William Schlarb	9:33.2	5. Barry Pallet	9:55.0			5. Kenneth Bauer	82.9
<u>Senior</u>		<u>Senior</u>		<u>Senior</u>		<u>Senior</u>	
1. William Shailor	23:04.0	1. Tom Sova	19:34.2	1. Tom Sova	14:41.0	1. Charles Wiese	115.3
2. Tom Sova	22:15.2	2. Robert Dunham II	17:03.8	2. Gregory Simon	13:19.4	2. Ronald Ganser	110.8
3. Richard Doig	18:32.0	3. Ronald Ganser	16:13.2	3. Michael Kuehne	11:13.0	3. Robert Dunham II	109.6
4. Ronald Ganser	17:03.8	4. William Shailor	12:25.0	4. Ronald Ganser	9:01.2	4. Peter Lewis	109.2
5. Robert Dunham II	16:35.0	5. Gregory Simon	11:38.2	5. Robert Dunham II	9:00.6	5. Brian Pardue	106.0
<u>Open</u>		<u>Open</u>		<u>Open</u>		<u>Open</u>	
1. Clarence Mather	30:00.0	1. Larry Cailliau	23:19.0	1. Bucky Servaites	22:18.8	1. Rudy Kluiber	127.0
2. Jim Richmond	28:50.6	2. Dennis Jaecks	21:06.0	2. Jim Richmond	21:48.6	2. Larry Cailliau	121.0
3. Al Rohrbaugh	27:28.6	3. Jim Richmond	20:34.8	3. Al Rohrbaugh	19:40.6	3. Don Chancey	117.5
4. Dennis Jaecks	26:23.4	4. Clarence Mather	19:11.6	4. Wayne Zink	14:31.4	4. Bucky Servaites	116.0
5. Gilbert Graunke	23:56.2	5. Charlie Sotich	18:30.6	5. Charlie Sotich	12:11.0	5. Robert Watson	115.0
<u>Indoor Scale</u>		<u>PennyPlane Event</u>		<u>PennyPlane Event</u>			
<u>Junior</u>		<u>Junior</u>		<u>Open</u>			
1. William Wood	100	1. Tim Stone	5:55	1. Dennis Jaecks	12:25		
2. Barry Pallet	92	2. Tim Noonan	5:25	2. Larry Cailliau	11:36		
3. Scott Wisniewski	82	3. Kurt Berg	5:16	3. Martin Richardson	11:31		
4. Bruce Pallet	80	4. John Gvrtlik	4:59.3	4. Clarence Mather	10:40.1		
		5. Bob Perkins	4:29	5. Joseph Sova	10:39		
		6. Gregg Miller	4:01.7	6. Rol Anderson	10:03		
		7. Mindi Linstrum	3:35	7. Charlie Sotich	9:54		
		8. Dan Hinich	3:26	8. Warren Williams	9:50		
		Scott Wisniewski	3:26	9. Bucky Servaites	9:34		
		9. Jenny Linstrum	3:19	10. Richard Hardcastle	9:32		
		10. Gordon Clark	1:42	11. Rolfe Gregory	9:22.4		
				12. Hank DeKat	8:54		
				13. Robert Hayes	8:01		
				14. Ken Kraemer	7:57		
				15. Jack Tisinal	7:24		
				16. Al Kirchoff	7:19		
				17. Jim Pulley	7:10		
				18. Howard Haupt	7:07		
				19. Otto Curth	7:00		
				20. Hardy Brodersen	6:22		
				21. Gordon Wisniewski	6:19		
				22. Bob Johnson	5:56		
				23. Dave Linstrum	2:39		
<u>Senior</u>		<u>Senior</u>					
1. Mark Kummerow	130	1. Tom Sova	10:23				
2. Brian Webster	105.83	2. Kim Mather	7:19				
3. Michael Kuehne	103.67	3. Mark Kummerow	7:15				
4. Patrick Wood	54.0	4. Bill Shailor	6:53				
5. Michael Joerms	51.33	5. Greg Simon	4:29				
		6. Rich Jaros	3:40				
<u>Open</u>							
1. Frederick Stark	146.67						
2. Charles Markos	130						
3. Clarence Mather	124.33						
Don Garofalo	124.33						
4. Bucky Servaites	118.0						
5. Charlie Sotich	112.67						

'72 Indoor Nats

by Curtis Janke

The most inspiring feature this year was the presence of the two little girls, daughters of Dave Linstrum, who flew in the PennyPlane event and did surprisingly well. Did their own winding, with Pop holding.

I didn't fly in the glider event, of course, and was pressed into sitting at the table and counting gliders so that no one tried to fly more than three. From what cards I saw, the times seemed to be mediocre. (Ed. Note: all times were lower than '71, except for the top two times in Open HLG, which were up by a fair margin.)

Tuesday, very early in the day, there was noticeable lift, but the sun went behind clouds soon after that for the rest of the day and this seemed to affect the times. I think that Mather was first with about 30 minutes, Richmond next with close to that and Rohrbaugh next with about 28 minutes.

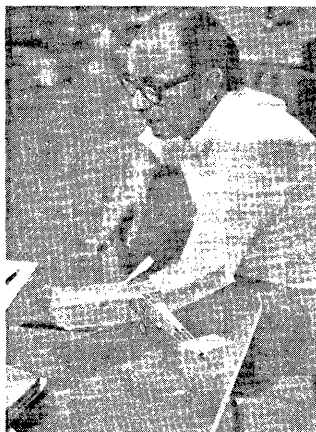
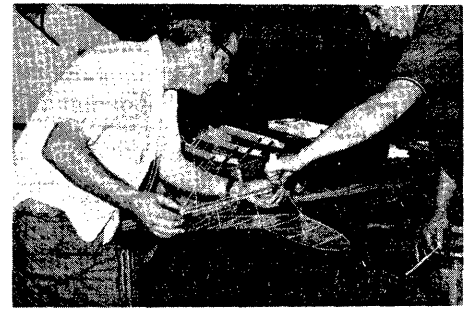
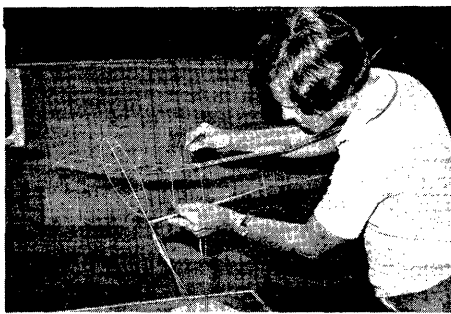
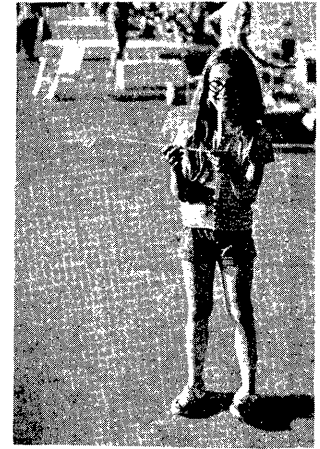
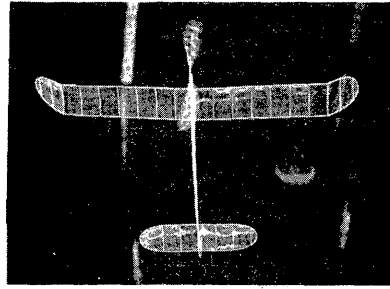
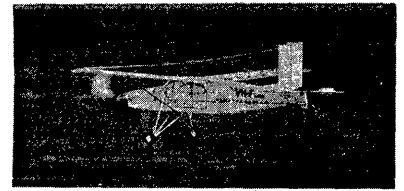
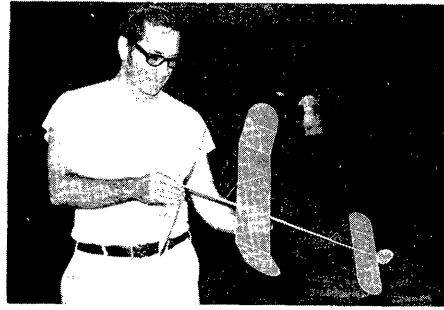
Richmond's best flight got up quite high but didn't do the rafter-banging that featured his wins of other years. He placed high in paper, and the ship seemed to be flying well. (Ed. Note: Jim's 20:34.8 third place would have won in '71.) Jim also took second in Cabin, with almost 22 minutes. He spent more time on this than on the others combined, but took only two flights. First he damaged the model during processing (token processing was in effect for Paper and Cabin, but not Stick.) He repaired it, then ran into difficulties several times while winding, requir-

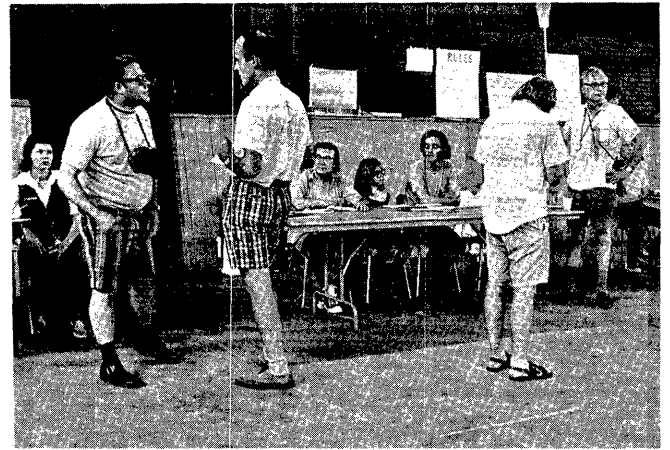
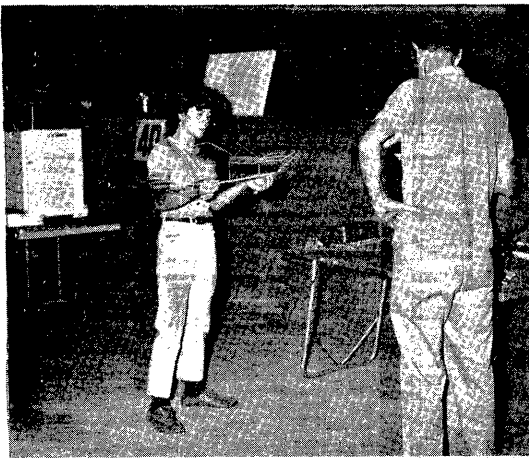
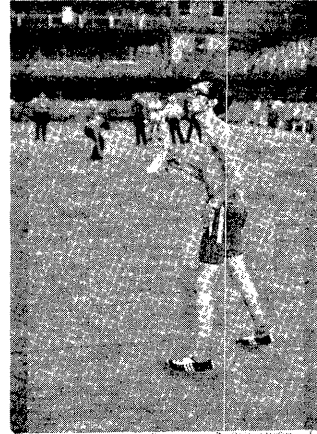
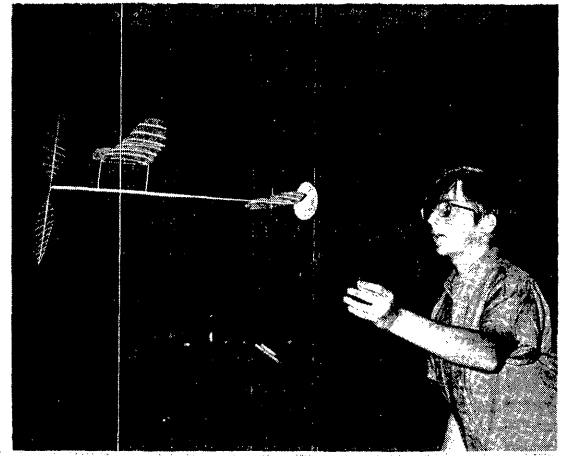
ing further repairs. He eventually did get off a flight after repairing some damage incurred during wind-up, but the ship climbed too fast and hung. He bumped it down, but completely smashed the rudder and stab. I advised him to transfer tail surfaces from one of his Stick models, (this would have been relatively simple, requiring only cutting both booms at the right spot and splicing) but instead he pulled off one of his miracles and repaired it. This called for an almost 100% recovering job (from a sheet of patch film I was able to supply, and which I would have sworn didn't have that much film on it!) as well as the gluing of broken ribs and outlines.

He got it off about 8:30. It struck another model head-on during the flight but both bounced away unscathed. It may have struck lights once or twice during all this as well, but it was hard to follow against the glare of the lighted bulbs.

The most remarkable ship there was Rohrbaugh's large ship which he took out fairly late in the day. It had a span of around 48" (very high aspect ratio) with a 27" prop that turned over at an incredible 35 RPM in the climb. He didn't get it high enough to really show its potential, but it was a slow airplane and turned in remarkably high time at low peaks. The dihedral he used looked like a tow-line format; in fact I called it a mike-covered Nordic.

What few official flights I had didn't amount to much, and were made under difficult conditions. My paper job of







some vintage seemed to be in trim, but it hung and was destroyed after one fairly good flight. However, a new "C" that I built for the meet got up into the peak on an unofficial flight (launched by Richmond, who picked the perfect spot for a classic pattern) but it was the first time in the air for the airplane. It landed deadstick and did only 24 minutes. Perhaps it would have done better with the longer loop I tried next, but the wing was just too weak and folded on the next (official) attempt.

-30-

From other correspondents we gleaned a few more items about the "largest Nats ever" (at least in total entry). Everyone gave high praise for Bob Champine's work as Indoor Category Director, and for Ron Evans, who ran HLG. Somewhat cool air was mentioned as hampering HLG times, and drift was high during the Rubber events. To someone it seemed as if there were more hung models, and there was a narrow escape when a light came loose as it was lowered for model retrieval.

One other item stood out in everyone's mind: the timer situation. Navy timers were not available, so volunteers supplemented a time-a-flight-fly-a-flight system. All who commented mentioned the high degree of cooperation evidenced in this operation - both indoors and out - and we can all be proud of the universally good response. It would be well to note that this type of operation will probably be typical for all future Nats, so we are off to a good start that can become a tradition.

#### INDOOR SCALE REPORT

By Dr. John Martin

Total entry in the Indoor Scale, Peanut Scale and Navy Scale events was 61, with 29 in Indoor Scale and nearly as many in Peanut Scale. New rules for Indoor Scale stated that flight points could not exceed workmanship points. Therefore, judging became crucial and the judging this year was very tough. Static scores (top five) were:

1. Tom Stark	DeHaviland 29	78 2/3
2. Bob Clemens	Longster	78
3. Andy MacIsaac	PT-19	71 1/2
4. Don Garofalow	Corbin Super Ace	71 1/3
5. Fulton Hungerford	Boeing 80A-1 Trimotor	70 1/3

As can be seen from above, the best possible total score would be 157 1/3. Of those who flew, 10 equalled or bettered their static score, 15 did not. The average score for workmanship was 57 out of 100 possible; pretty strict! The flying was over early for the 10 who equalled their static score, and the rest posted their four official flights in quest of their best times.

A different type of ship will emerge as a result of these new rules - which were well received by most of the modelers. Just after the contest, it was possible to send the winning model to the Smithsonian for display! Bid goodby to the flimsy three-minute flier! (Final results elsewhere in this issue).

The winning model (DH-29 Doncaster) was large (about 28" span), blue tissue covered, strictly scale model of 1 1/2 oz. weight. It was loaded with scale details: shocks, external control horns and wires, realistic scale engine, windows, padded cockpit, outlined surfaces and no deviation in number of ribs, spars and amount of dihedral. The prototype was an early passenger monoplane; DeHaviland's first monoplane with cantilever wing.

Due to the scale dihedral, Tom had plenty of problems with trim despite the fact that this was his third year with the model. At one time he had 45" of 1/4" pirelli stuffed inside. It survived several hard crashes before making 1:08 to win on the last flight. A beautiful model!

The winning Senior model was a 1911 Cessna, modified from a Henry Struck plan and incorporating all the details of the original. The first flight (1:08) exceeded the static score of 65, giving Mark Kummerow a score of 130, a tie for overall 2nd place.

Navy Scale, an unofficial event, was offered as a tribute to the Navy by the Michigan Cloudbusters and as a farewell to the Nats sponsor of so many years. The severe judging of Indoor Scale was continued in Navy Scale, where any Navy aircraft was eligible. Tom Stark repeated his winning ways to take this event also. The top five:

1. Tom Stark	Brewster XSB-1	118
2. Dr. John Martin	Martin MO-1	104
3. Ed Fort	Lewis & Vought VE-7	99
4. Ralph Kuenz	F4F3 Wildcat	82
5. Pat Wood (Sr.)	Douglas A-1	75

The winning model, a Brewster XSB-1, an obscure and unlikely flyer, is a barrel-shaped, mid-winged and stubby airplane which performed beautifully for Tom Stark; and his flight of 59 seconds just equalled his static score of 59 points. The model had 20" span, weighed 1 oz. and was covered with clear-doped colored jap tissue. Power was four strands of 1/16" pirelli in a loop three times the distance from nose to rear hook. The winning flight carried 1760 turns.

To this writer's thinking, Peanut Scale has got to be the most interesting and exciting indoor event. Consistency is a factor since the score is a total of three official flights. A ten point bonus for rise-off-ground tempts one to risk "blowing" the whole deal by letting the 13" rascal struggle off the boards into the air. This event properly balances the scale emphasis of Indoor Scale by stressing flying and consistency. I feel that Indoor Scale should always be accompanied by Peanut Scale to balance out the program! At the Nats, Peanut is another unofficial event sponsored by the Cloudbusters. The event is still growing in popularity, with the models resembling the 1935 Megow 10 1/2 kits. It drew almost as many entries as Indoor Scale including such "pros" as Sotich, Hardcastle, Warner, Mather, Stark, Martlet and Hungerford.

Bill Warner won the Hannan Best Antique award with a wierd canard Sopwith SE-1 that fortunately never hit anyone during its aerial escapades. It was a mass of horizontal and vertical fore and aft planes, and it was fast! Getting these little one-foot beasts to trim out is not as easy as it looks. The top ten Peanuts:

1. Clarence Mather	Nesmith Cougar	359
2. Al Kiechoff	Nesmith Cougar	232
3. Dr. John Martin	Martin MO-1	227
4. Mike Kuehne (Sr.)	Beardmore Wee Bee	215
5. Tom Stark	Damlier L-15	214
6. Jim Pulley	Waterman Racer	174
7. Don Garofalow	Nesmith Cougar	146
8. Charlie Sotich	Volksplane	141
9. Steve Ovavec	Piper Vagabond	137
10. Chris Clemens (Jr.)	Farman Mosquito	133

As a warmup to his win in Indoor Stick the following day, Clarence Mather won Peanut Scale with a "bare bones" Cougar. The span was 13", single covered with microlite. Power was a 15" loop of .043" pirelli; 1200 turns gave consistent flights of 2 minutes. The model weighed under 3 grams and was constructed of 1/32" sq. C grain 4 lb. wood throughout. "Such a model is capable of a lot more time," observed Mather. It is interesting to note that Clarence ignored penalties for single-covered flying surfaces and for using microlite covering. In fact, his model had the lowest static score of the 25 models entered - a minus 13. He also disadined another 10 points by not choosing to R.O.G. on any flight. The proof that he knew what he was doing was that he won the event, on flying time alone, by a healthy 127 point margin! Some post-event muttering produced a most helpful suggestion: All Peanuts should be double-covered with Jap tissue, period. To this correspondent, an excellent suggestion! Any Peanut structure supporting two layers of Jap tissue would end up in the 4 to 5 gram class without the need for a weight rule.

Charlie Sotich's super-light Volksplane met disaster when his pirelli hung up on the internal tungsten bracing on flight #2. The fuselage of the .076 oz. (2.2 g) model was demolished while extricating the rubber.

The Farman Mosquito by Chris Clemens won Junior Peanut while powered with an 18" loop of .070 pirelli. The model was double-covered with condenser paper and was scaled down from the Lew Gitlow design.

Some concluding observations: The atmosphere of this scale contest was electric! At the conclusion of HLG (which can be described as hectic) an appreciative core of spectators remained. As I recall, Mr. Neiderhauser put up a flight with his Douglas M-2 "Globe Girdler" biplane that was as esthetic an experience as watching Pavlova do a ballet pas-de-deaux. When the craft landed and appreciative gallery applauded the flight in salute! This was a stirring moment. Succeeding flights were greeted with applause from those who knew what was transpiring. This sincere appreciation for effort touched this reporter's sensibilities! Come and spectate next year!

Also, the new rules (flying time cannot exceed workmanship points) have accomplished something. Pilatus Porters and Cessna 1911's did not dominate the event as in past years. Of the 12 models on top in overall score (including two ties) only two Cessnas and one Porter were placed. Next year's scale model will be a lot more like a real aircraft - ribs, rigging, etc. (and probably heavier). Hopefully, Peanut Scale will remain the joyous giggle that balances the serious efforts of the Indoor Scale modeler.

New Members!

JIM RICE, 632 NW 57 Ct., Miami, Fla. 33126

Nats Report - Thanks!

The July issue carried a plea for help in reporting the '72 Indoor Nats. The response was terrific - lacking only details of HLG - and came out so well that this may well become a regular thing. Five people sent photos - a total of over 30 to choose from - with excellent choice of subject and good captions. Your editor has always had a "conflict of interest" in reporting the Nats - either he was flying or CD'ing - neither calculated to make for an efficient and complete report. Not only did those who sent reports and pix make this issue possible, they did so well that a group effort is obviously much preferred!

Nats Indoor Champion

One item of interest was omitted from the many reports received - who was Indoor Champ? It is possible to piece together an interesting picture of very close performance, without actually discovering who the winner was.

To understand the above, we need background. First, Championship rules require that aspiring Champs submit an entry naming which events they wish to be scored in, and this entry can comprise no more than half the number of events in the category (fractions rounded to next larger integer). For Indoor Champ, five events (Stick, Paper, HLG, Cabin and Scale) are official, making 5/2 events (round to three) to be counted. Points are awarded as % of the winning score. The performance of four possible contenders are summarized below:

	Stick	Cabin	Paper	HLG	Scale
Richmond	96	97.7	88	0	0
Mather	100	0	82	0	85
Cailliau	0?	0	100	95	0
Servaites	0	100	0	91.3	80

The question mark by Cailliau's name in Stick reflects that Larry might have entered Stick and placed below the information available. The other three fliers are shown with scores in just three events apiece. If they each entered for Champ and declared the events shown, Champs scores are: Richmond - 281.7; Servaites - 271.3; Mather - 267. Cailliau would have needed 86.7 points in Stick, but 5th (Graunke, flying a Slithery-Dee) was 80 points. So, depending upon who entered what, and what was declared for Champs points, the Indoor Champion was either Richmond (again), Servaites or Mather. (After computing all the above, curiosity overwhelmed me enough to prompt a phone call to pin down the Champion - it was Jim Richmond - but by a very narrow margin as shown above. That makes three times - congratulations, Jim!

FAI INDOOR REPORT

Team Departure

Shortly after you receive this issue, the U.S. Indoor Team (Bud Romak, Pete Andrews and Sal Cannizzo; with Bud Tenny as manager) will be enroute to the 1972 Indoor World Championships at Cardington, England. Thirteen countries are reported to have entered the contest, which will be flown Aug. 26-27, 1972. The U.S. Team will leave Aug. 20, expecting to be set up for possible needed repairs by Aug. 22. Official test flying will begin Aug. 25, with the contest beginning early the next day. Wish us luck!

Other European Teams

The July '72 INAV listed team members for Czechoslovakia, Italy, Hungary, Poland and Romania. Of these, only Hungary will not be attending the WCh; it was not then and still is not possible for me to tell which other countries make up the 13 entries reported. Since that issue, both England and France have reported on their team members:

England	France
Laurie Barr	Guy Cognet
John Blount	Jean-Claude Souveton
Martin Shepherd	
*Reg Farham	*Mrs. Souveton

\*Managers (France had a third member, a Mr. Meritte, who had to resign. A report is available of the British Finals, which will be presented in a later issue. Top times were over 33 minutes in Cardington. French times were around 30 minutes in a 38 m hall near Paris.

Besides the records listed below, I received a photo of an A ROG model which "set a Junior record during the Nats." No other mention was made, either of who the flier was or the time involved. Also, a hand-written note on my copy of the official results indicated that Mather's 30 minute flight was a record. If he had been flying an FAI model (Janke's comments seem to preclude this) it could have been a AMA Cat. II FAI record.

TULSA GLUE DOBBERS RECORD TRIALS, July 16, 1972, Cat. I  
John Mabee Gym, Univ. of Tulsa, 34' 11" ceiling.  
Open FAI Cat. II FAI - 17:53, John English  
Senior Cat. I Paper Stick - 11:58, Robert Dunham II

1972 INDOOR NATS - July 25, 1972 - Cat. II (90' ceiling)  
Brig. Gen. R. L. Jones Armory, Chicago.  
Senior Paper Stick - 19:34.2, Tom Sova

THE PICTURE STORY

The captions below are for the pix on pages 2 & 3; numbers in parentheses after the caption key the source of the pictures according to this code:

(1) U.S. Navy; (2) Ron Plotzke; (3) Dave Linstrum; (4) Bob Clemens processed photos by Chris Clemens; (5) Gilbert Graunke.

Page 2 (vertical columns)

Left top: Overview of the indoor site during HLG (1)

#2 left: Bob Champine measures span of Charlie Sotich's Paper Stick (1)

#3 left: Richard Doig, member Detroit Balsa Bugs (2)

Bottom left: Fulton Hungerford, Curtis Pusher Peanut (3)

Top center: Jim Richmond & Paper Tiger (2)

#2 center: Al Rohrbaugh's high A/R "300" (4)

#3 center: Ralh Kuenz (1) and George Lewis examine "Golden Peanut" trophy (3)

#4 center: Paul Simon (1) helps son Greg prepare to fly Greg's cabin model (2)

Bottom center: Clarence Mather and Bipe (1)

Top right: Charlie Sotich's Volksplane (4)

#2 right: Jenny Linstrum and PennyPlane (3)

#3 right: Unidentified flier with variable-camber HLG (3)

#4 right: Rohrbaugh (1) and Wayne Zink wind Rohrbaugh's cabin model (2)

Bottom right: Dennis Jaecks and top Penny Plane; 8" wing chord! (2)

Page 3 (horizontal rows)

Row 1 left: Members of Bong Eagles on HLG day (5)

Row 1 right: Bill Shailor and Paper Stick (1)

Row 2 left: Jim Richmond (1) and Curtis Janke (5)

Row 2 center: Grady Turner, Longview, Texas (3)

Row 2 right: Mike Thompson, Lorain, Ohio (3)

Row 3 left: Kim Mather and Dad Clarence with Kim's first microfilm model (1)

Row 3 right: Dennis Jaecks and Bill Bigge (r) in left foreground, Curtis Janke (1) and Ron Evans beside unidentified young lady (5)

Row 4 left: Wayne Zink holds cabin model for winding (3)

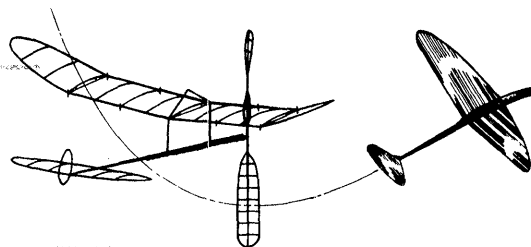
Row 4 center: Dick Hardcastle catches Indoor Stick (2)

Row 4 right: Indoor Scale judges at work (3)

# INDOOR

## NEWS and VIEWS

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



### 1972 INDOOR WORLD CHAMPIONSHIPS

1. Pete Andrews	U. S. A.	32:20	36:12	10:14	27:45	30:38	34:57	71:09
2. Karol Rybecky	Czechoslovakia	32:37	33:29	-	35:41	15:53	33:54	69:35
3. J. Jirasky	Czechoslovakia	29:30	32:37	36:12	0:13	31:39	29:56	68:49
4. Jiri Kalina	Czechoslovakia	29:48	22:35	14:32	13:00	30:24	38:18	68:42
5. Sal Cannizzo	U. S. A.	29:06	34:02	30:50	30:21	34:08	32:58	68:10
6. Aurel Popa	Romania	33:31	4:20	9:28	32:02	24:45	6:12	65:33
7. Bud Romak	U. S. A.	26:57	25:22	11:51	9:27	29:05	36:06	65:09
8. John Blount	England	31:18	14:18	25:16	29:51	28:00	32:52	64:10
9. Stefan Bombol	Poland	25:50	26:43	32:02	30:15	29:11	13:02	62:17
10. Adalberto Frioli	Italy	22:41	30:25	31:29	6:51	0:06	27:02	61:54
11. Teodor Strasberger	Yugoslavia	26:22	32:23	14:40	23:58	28:52	29:28	61:51
12. Otto Hints	Romania	27:48	8:36	27:22	4:20	29:47	31:33	61:20
13. Vilim Kmoch	Yugoslavia	26:05	30:09	0:23	24:44	23:06	29:53	60:02
14. Pentti Nore	Finland	26:33	27:55	22:56	29:04	30:01	28:25	59:05
15. Vasile Nicocara	Romania	28:56	4:56	12:09	17:01	29:42	19:19	58:38
16. Leopold Gabriel	Yugoslavia	28:52	29:23	28:13	23:05	27:47	0:25	58:15
17. Carlo Cotugno	Italy	24:51	27:53	27:02	19:40	26:31	30:18	58:11
18. Boyd Felstead	Australia	28:48	28:52	0:07	27:07	23:24	0:06	57:40
19. Martin Shepherd	England	23:31	28:03	8:54	28:49	21:38	0:06	56:52
20. Kurt Vogler	Germany	26:50	0:26	25:10	29:22	26:25	7:51	56:12
21. J. C. Souveton	France	23:16	29:13	26:28	13:53	24:04	23:09	55:41
22. Sylwester Kujawa	Poland	26:46	26:36	14:54	24:44	27:33	9:12	54:07
23. Ryszardol Czechowski	Poland	24:35	25:17	26:15	0:17	17:46	25:16	51:32
24. Harro Erofejeff	Finland	20:43	23:56	25:53	24:59	10:28	-	50:52
25. Guy Cognet	France	19:30	24:42	24:41	26:52	17:38	0:21	49:34
26. Harri Raulio	Finland	23:05	23:08	20:56	24:24	23:58	17:08	48:22
27. Germano Masciullo	Italy	23:54	23:55	20:45	23:03	18:09	16:28	47:49
28. Laurie Barr	England	0:09	25:51	17:11	15:55	18:23	20:10	46:01
29. Horst Tiemann	Germany	20:54	20:35	19:02	20:10	21:39	23:26	45:05
30. Mike Thomas	Canada	17:19	18:12	16:11	18:14	19:27	19:34	38:01
31. Herbert Langner	Germany	15:20	19:03	17:28	18:15	0:12	17:15	37:18
32. S. Nonaka	Japan	0:12	13:42	19:00	9:55	0:15	10:16	32:42
33. W. H. Beekmeyer	Holland	6:53	9:46	7:15	3:30	13:23	19:02	32:25
34. Cornelis Wolthoorn	Holland	6:55	5:36	8:13	6:03	13:25	18:49	32:14

### TEAM PLACINGS

1. Czechoslovakia	207:06	8. Finland	158:19
2. U. S. A.	204:28	9. Germany	138:35
3. Romania	185:31	10. France (2 men)	105:15
4. Yugoslavia	180:08	11. Holland (2 men)	64:39
5. Poland	167:56	12. Australia (1 man)	57:40
6. Italy	167:54	13. Canada (1 man)	38:01
7. England	167:03	14. Japan (1 man)	32:42

### 1972 INDOOR WORLD CHAMPS

Although the trip to a WCh really begins when a man wins the Finals, the proof of all the planning comes as the actual journey begins. Our team achieved a first - models completely undamaged during the trip across. Special boxes and handling precautions helped prevent the damage which usually happens, as all air carriers allowed us to carry the models to the plane and sometimes to load the boxes ourselves.

Pete Andrews and Sal Cannizzo had boxes patterned on the one used by Eduard Chlubny in 1970. These boxes had three sections hinged together at the back, with wings in both side sections and fuselages in the center. This allows access to any single model without disturbing others. Bud Romak's boxes were renovated 90 cm boxes, with plexiglas replacing one side panel. This feature allowed both Customs and airline officials to see why we needed special handling, and eased our way tremendously. In addition, all the boxes were covered with foam rubber for a cushion effect (Romak's foam was removable over the plexiglas).

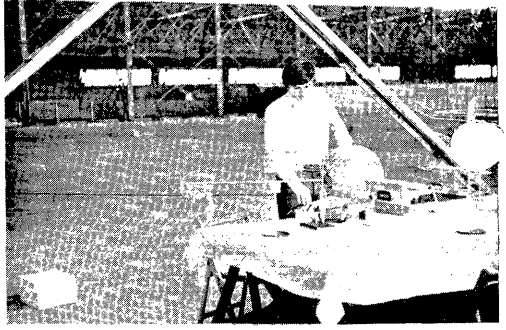
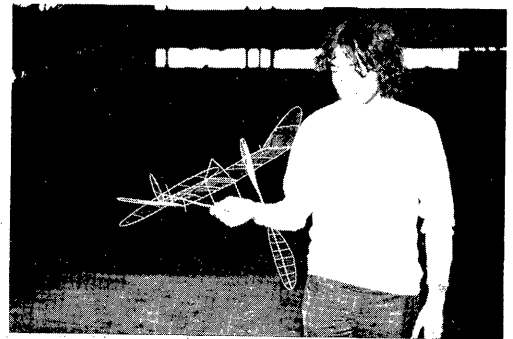
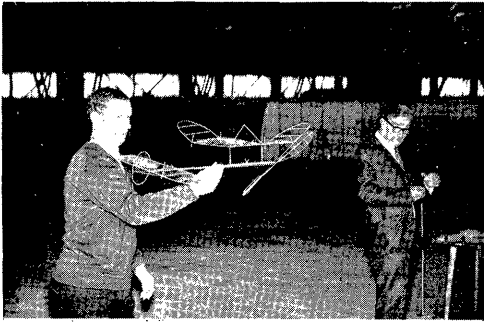
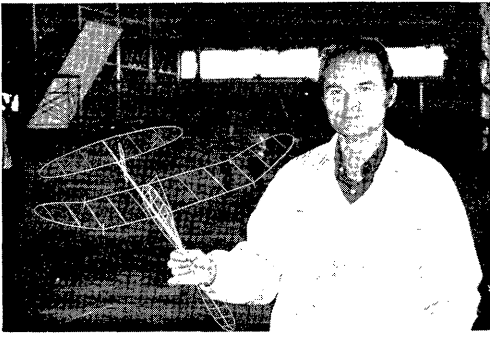
With no repairing needed, we had plenty of time to snap and sight-see. We had planned to arrive early so we could "change over" to European time, so we all were well rested by the time the contest started. Meanwhile, we visited London via train and subway (no way would we drive back into London traffic until we had to!) for shopping and sightseeing. We drove to nearby Bedford to catch the train, and found Bedford to be a nice place to visit also. Three trips into Bedford served to acclimatize us to the unnerving sensation of driving on the wrong side of the

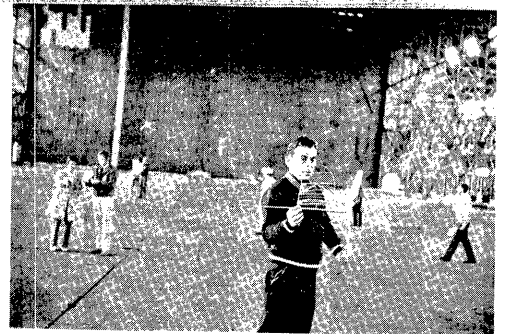
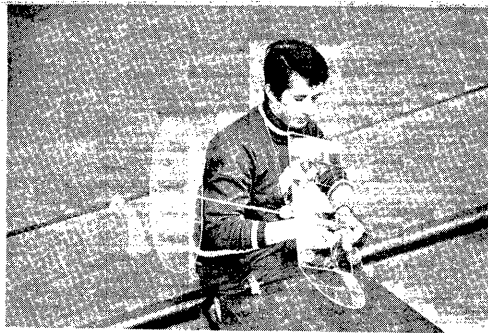
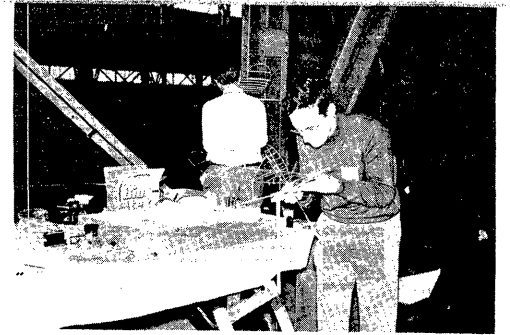
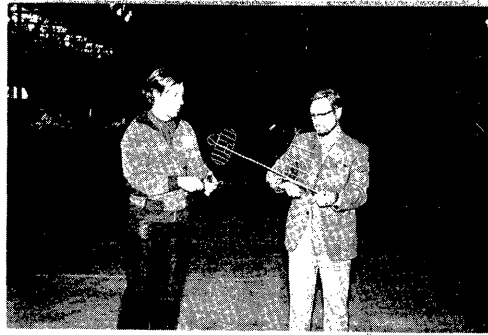
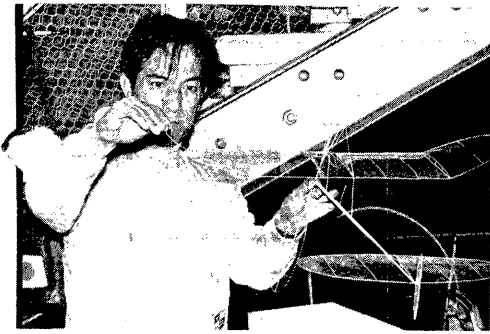
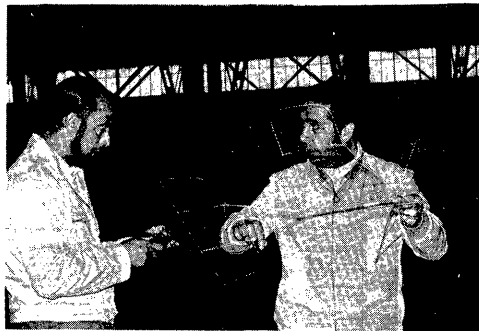
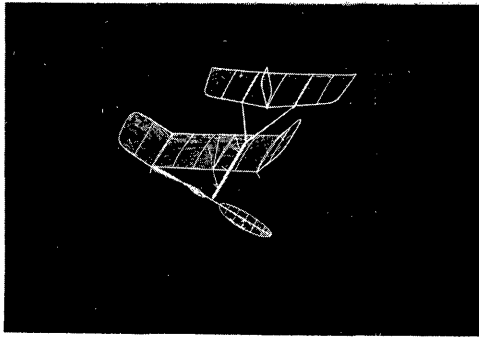
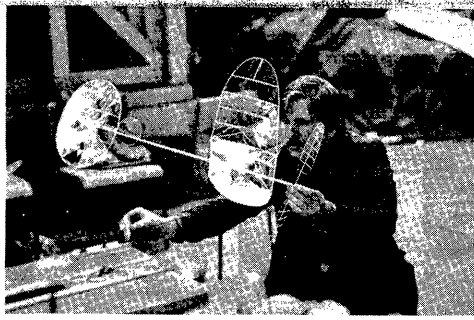
road while shifting gears with the left hand instead of the right! Narrow country roads added (or subtracted) a dimension to the experience - meeting a bus or truck seemed to leave no room for us! After numerous trips between Cranfield and Bedford, and Cranfield and Cardington, Sal Cannizzo was declared the champion driver and he won the privilege (?) of making the return trip to London's Heathrow Airport.

Thanks to the arrangements by Laurie Barr and Ron Moulton, we were allowed to settle in at Cranfield Institute as soon as we arrived. The extra charge for room and board was less expensive than a London hotel would have been, while the staff and accommodations at Cranfield made us feel right at home. It hardly seems possible for any accommodations for wandering modelers to be better than these, and the bountiful supply of food was graciously served. The evening we arrived, we knew we were entering an aviation environment when we saw student glider pilots being towed and released on practice flights, even in the twilight hours. A beautiful sight!

Fourteen countries entered the 1972 WCh, with Czechoslovakia, England, Finland, Germany, Italy, Poland, Romania, U. S. A. and Yugoslavia fielding full teams. France and Holland entered two-man teams, while one flier came from Canada, another from Japan and Boyd Felstead sent a proxy entry from Australia. This made 34 entrants, ranging from seasoned teams to relatively inexperienced fliers who had never flown in a hangar and in some cases had not built models larger than Easy B before preparing for this event.







One fact stands out regarding the results: extensive experience in international competition is important training. The placings through 7th place directly reflect each team's experience in international competition, with the exception of the U. S. The Americans have extensive competition experience, including WCh experience for Romak and Andrews (Gannizzo has flown Wakefield in two WCh's) and all survived tough competition in the Finals. It has long been axiomatic that constant practice, preferably in competition, is essential to prove the combination of man plus indoor model, and this certainly held true in this contest. I am not so naive as to assert that practice is a cure-all; the point is that practice as a team or as an individual in hard competition is an absolute must for the finely-honed performance now required to win an Indoor Championship.

Test flying sessions were relaxed get-togethers which gave advance warning of what the competition might be, and generally had better flying conditions than the contest itself. Not too many notes were made about test results, except that no one missed hearing about the 4:05 test by Pete Andrews. No one knows how many people timed Pete's first official flight, but there were many!

The contest was organized to minimize the number of models airborne at one time. Each flier had to post three flights each day, and no team was permitted to have more than one model up at once. The 10 am to 6 pm official flying schedule tended to cramp three-man teams somewhat; simple arithmetic showed us that the first flight must be up by 11:15 if we were to have time for all the flights. In fact, once we began taking official flights, we had a timing crew assigned to our team almost all the time. The time crunch figured this way: five minutes minimum to take the model from the team's area to processing and out onto the floor; five minutes to wind and launch, 30 minutes or more (hopefully) to fly, and about three minutes to clear the watches, record the time and get a new timing crew. With nearly seven hours out of eight taken with active team flying, only spectators had time to study the scoreboard in detail to keep track of the team standings from hour to hour. This differed from a strict rounds system, where it is possible to review standing at the end of each round and adjust strategy if needed.

The results listed above show final team standings. At the end of the first day, the three-man teams were in this order: Czechoslovakia, U.S.A., Yugoslavia, Italy, Poland, England, Finland, Romania and Germany. From the results and from having watched the flying, it seems likely that any one of the U. S. or Czech fliers could have won the whole thing, and the other five might have filled in the next five places in any order. Cool air and drift kept the inversion layer so high that anyone who made it through the inversion almost certainly hit the top. Luck in rafterbanging had a large part in determining the final scores, and only one flier seemed to have an edge. Pete Andrews seemed to have slightly better altitude control so that his models hit later and easier. It was a formidable task to hit that narrow layer, and Pete seemed to have the key.

Three of the four newcomers to international competition - Holland, Canada and Japan (Australia was a new entrant, but the models were flown by highly experienced fliers) did very well considering their lack of experience and lack of places to fly. Mike Thomas of Canada was a volunteer who worked hard to improve his models, with some helpful hints from the nearby Czech team. Indoor has been sporadic in Canada, and hopefully Mike's efforts will be rewarded by support and encouragement from his countrymen.

Cornelis Wolthoorn and W. H. Beekmeyer represented Holland. Beginning four weeks before the WCh, they built the first 65 cm models ever built in Holland. All through the contest they were learning and improving their models, even building new motor sticks and wings. Their reward was a final score double that of their first day's time - a fine achievement! They also vowed to return to Cardington whenever possible to continue learning.

S. Nonaka, of Japan, had other problems. Part of his journey to the WCh was on a Russian airline with severe luggage restrictions. So, his models arrived in a box about 9" x 9" x 23". Inside were two complete motor sticks with tail surfaces removed, two props and one braced wing. He built at least one more wing at the meet and braced it with silk. Except for the auditoriums built for the Japan Olympics (which have not been available for Indoor), sites are almost non-existent in Japan. It will be interesting to watch this nation of craftsmen build on what Mr. Nonaka has learned!

Germany's low showing was disheartening to them, but it was a triumph of hard work and good leadership. Only Kurt Vogler had much previous indoor experience, and he had recently recovered from severe illness. Tiemann and Langner were absolute beginners, flying the first indoor models they had ever built. All the German models were small (narrow chords) and Tiemann and Langner had models weighing 1.3 and 1.4 grams respectively. However, these models climbed high, flying cleanly, and were very well

adjusted. Gunter Maibaum had done his coaching well, and can be proud of the results.

Germany is another country without adequate sites - Westfallenhalle in Dortmund is drafty and available only at odd times on short notice. It is heavily booked by both industry and entertainment users, and permission for a flying session may be forthcoming with only a day's warning. Gunter remarked "It is ironic that the Land of the Zeppelin has no hangars left!"

The most exciting part of the contest (predictably) came in the afternoon of the second day. The Czech's lead was not insurmountable, and Romak and Kalina had almost exactly parallel troubles. Both had only average times on flights 1 & 2, hangups on 3 & 4, and the need to safely increase their standing before going all out on #6. It is to their credit that their strategy thus included team standings instead of personal glory. It became a very close battle, and very exciting for everyone.

The pressure on the Czech team really built up during Sal's last flight. He had boomed it up - to the top in just over three minutes. It should have hung up any number of times, as it spent about three minutes above part of the ironwork. As soon as it was clearly out of danger, most people counted it as a 38 minute flight. A patch of bad air just below the inversion layer cost a loss of over 40 feet of altitude - a rapid sink - before good air was available again. The damage was done in spite of a very slow-settling cruise, and it landed at 32:58. Kalina and Romak had the last of the good air for their flights, and Pete put up a beautiful flight that got all there was to be had. He gently rafterbanged for a long time, then came down slowly with the third highest single flight of the contest.

Only Rybecky's flight was left as Pete's flight came down - he had launched about 10 minutes after Pete. It went high enough, and slightly to the side, banging a few times. He had a balloon up, and while talking to Josef Gabris (Czech team manager), the model ran into the string. He almost aborted the flight trying to move clear, and the model lost altitude. He landed to applause, but short of the time needed to win. It was all over then, and all the competitors converged on Pete Andrews to congratulate the new World Champion.

Boyd Felstead's four models, which survived the air freight trip from Australia undamaged, were well made and quite flyable. In fact, these models were a marvelous job for someone whose last serious indoor work was 20 years ago! Boyd has been a regular INAV subscriber, and has avidly corresponded with many fliers over the years. As he determined to enter models in this WCh, he sought advice from everyone until he almost had no time left to build. Erv Rodemsky (appointed Aussie team manager) and Manny Radoff, who cooperated in flying Boyd's models, finally had to write Boyd "Shut up and build!" He did, and Erv and Manny obviously enjoyed themselves in flying these models to the limit. On the final two flights, they had worked up to nearly two grams of rubber, and a full windup on the 6th flight was too much. The model moved out fast for about six feet, then the wings collapsed and wrapped around the fuselage. The model then dropped to the floor, shed the tail boom, and tried to fly like a helicopter!

Just as at any other contest, the after-hours activity included bull sessions and more serious discussions. In many cases, the discussions went on - with or without an interpreter - and sometimes struggling along on pieces of two languages. A lot of the discussion dealt with where the next WCh might be held, and what known sites might be both suitable and available. Even those qualifications are not enough - the country owning the suitable, available site must be willing to host the meet! With that qualification in the picture, the outlook is gloomy. The Indoor Championship activity has grown enough that very few countries can afford to host an event which would take several days to run off in sites smaller than a blimp hangar.

Another topic which was discussed was future performance of the one gram model, and the related topic of flight tactics. Gunter Maibaum predicted that the next major advance in model performance would come from prop design improvements, perhaps aided by small refinements in airframe design. He agreed with a prediction that 5 years of experience with one gram models would probably result in a 50 minute flight, given good conditions in a hangar. An important future strategy will be understanding hall meteorology, coupled with balloon-carried instruments to determine conditions aloft. Conditions to be monitored include altitude of the inversion layer, drift conditions, location and strength of possible thermals, and location of downdrafts. It is possible that future issues of INAV will have reports on such instrumentation and how it can be used to plan flight strategy.

In spite of the wide diversity of designs at the U. S. Finals, King Monoplane reigned supreme at the WCh. Also, very few models exceeded 8" chord, and only a few squarish wing tips were in evidence. Even though the latest theory dictates a rectangular planform like those used in the

Finals by Richmond, Randolph and Radoff, apparently the structural efficiency considerations encouraged non-rectangular planforms. Dihedral ribs equal in length to root ribs must be very strong when wings are wide! Sal Cannizzo's parallel-chord-circular-tip planform, popularized by Richmond ('67 - '70) performed excellently and may be the best wing area/structure compromise. The major consideration on wing shape appears to be gaining maximum wing area while holding wing distortion to a minimum under high loading and poor conditions. Sal's last flight is a case in point - the wing held flat even though the model was fully wound. In fact, the braced stab assumed an "S" shape - left tip down, right tip up - and Sal's only comment was, "That's really wound!"

Motor sticks up to 15 $\frac{1}{2}$ " long were noticed, while props varied between 17" and 20". Dihedral patterns were almost evenly spaced between polyhedral and tip dihedral. Mike Thomas, of Canada, had "v" dihedral and extra long wing posts - the lone dissenter. Stab area ranged from about 35% to about 50%, but it would take sophisticated measurements to reveal if there was a difference in performance.

Some very nice flight accessories were noticed - such as scales, torquemeters and rubber strippers. In particular, the Finns had a hand-held torquemeter with the scale on concentric drums, and the Poles had torquemeters which were gimbaled in two axes so the torquemeter would align itself properly during the winding. Another torquemeter setup used by several fliers had provisions to mount the winder opposite the torquemeter so the distance between hooks was the same as on the model. After winding the motor, the winder would be locked into its holder and the torque could be checked. If "S" hooks or "O" rings are used on both ends of the motor, it is then possible to hook the motor directly to the model with a known torque level wound into it.

The Jury, Sandy Pimenoff of Finland, Jean Ganier of France, and Ron Moulton of England, did an excellent job. One of their hardest decisions involved Romak's third flight. The model had been cruising very close to a main longitudinal stringer of the hangar, when it appeared briefly tangled with a model seemingly out of nowhere. The models separated, and Bud's model flew about 15 feet into a dangling sandbag in the top center of the hangar where it hung. Was this a collision - eligible for another flight - or equivalent to contact with any other obstruction? The final decision, after careful deliberation, was that the flight must stand with the time accumulated at the time it hit the sandbag.

A final word of thanks: The Society of Model Aeronautical Engineers created a superb contest which was a memorable experience. All arrangements and planning were well executed, and the facilities were excellent. Well done!

#### THE PICTURE STORY

All the photos on p. 2 & p. 3 were taken by Bud Tenny and Erv Rodemsky (Rodemsky photos identified by (R)). The pictures are identified below in horizontal rows:

##### Page 2 - Row 1 The U. S. Team

1. Bud Romak with 36:06 model. (R)
2. Sal Cannizzo preparing for test hop.
3. Pete Andrews with 36:12 model. (R)

##### Row 2 England

1. John Blount with Reg Parham in background.
2. Keith Bullock assists Laurie Barr; Laurie's son Arthur in background.
3. Martin Shepherd (England), youngest WCh entrant and youngest flier to make 30+ with one gram model.

##### Row 3

1. Manny Radoff displays Felstead's geodetic indoor model - very strong, slightly heavier.
2. Erv Rodemsky (Aussie Team Manager) and his bag of cameras - rumored to contain 15 cameras and 100 rolls of film!
3. The German Team - (1. to r.) Herbert Langner, Kurt Vogler and Horst Tiemann. (R)

##### Row 4 The Czech Team

1. Karol Rybecky, second place individual. (R)
2. Jiri Kalina with model like the one used for 38:18.
3. J. Jirasky, third place individual. (R)

##### Row 5 The Romanian Team

1. Otto Hints unpacking models during test session.
2. Nicoara Vasile with Otto Hints in background.
3. Aurel Popa, second youngest flier and highest placing flier from Romania.

##### Page 3 - Row 1

1. J. Moseley winds for Mike Thomas of Canada. (R)

2. J. C. Souveton of France.
3. Guy Cognet of France.

##### Row 2 The Italian Team

1. Very unusual model by Carlo Cutugno of Italy. (R)
2. Germano Masciullo winds Cutugno's model. (R)
3. Italian Team; (1. to r.) Cutugno, A. Frioli and Masciullo, with Fernando Migani, alos of Italy. (R)

##### Row 3

1. S. Nonaka of Japan. (R)
2. Harro Erofejeff winds for team mate Harri Raulio.
3. Cornelis Wolthoorn prepares model for test flight; one of first 65 cm models built in Holland.

##### Row 4 The Polish Team

1. Sylvester Kujawa returns from test flight.
2. Ryszard Czechowski, master machinist.
3. Stefan Bombol making a flight.

##### Row 5

1. Vilim Kmoch (Yusoslovia). (R)
2. Teodor Strasberger of Yugoslavia.
3. Peter Freebrey, Technical Secretary of S.M.A.E., calibrates the processing scales. (R)

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

##### New Members!

RICHARD FOX\*, 372 Oxford Ave., Akron, OH 44310

\*Richard is contact man for the CYO Model Plane Group, of the same address.

##### Honorary Members

PIOTR S. BOMBOL, Wroclaw 12, ul Spolozelniczol 44m4, Poland

CARLO COTUGNO, Via Eduardo Arbib n. 22, 00159 Roma, Italy  
RYSZARD CZECHOWSKI, Krakow, str. Pradnicka 68a/60, Poland  
SYLWESTER KUJAWA, Poznom, ul Swierczewskiego 114Em15, Poland

HERBERT LANGNER, 48 Bielefeld, Alfred-Bozistr 14, Germany  
GUNTER MAIBAUM, 5 Koeln 60, Gartheistr 3, Germany  
PENTTI NORR, Korsholmantie 6A1, 00700 Helsinki 7C, Finland  
HARRI RAULIO, Ulvilantie 15 A 10, Helsinki, Finland  
KAROL RYBECKY, Bratislavia, Durgalova 4, Czechoslovakia  
HORST TIEMANN, 48 Bielefeld, Mierfeld 45A, Germany  
KURT VOGLER, 42 Oberhausen, Schmiedstr 62, Germany

##### Change of Address

STEPHEN J. FAUBLE, RR#3, Macomb, IL 61455  
BOB GIBBS, P. O. Box 273, San Ramon, CA 94583

##### RECORDS? MAYBE!

INDOOR RECORD TRIALS, July 23, 1972, Cat. III  
Santa Ana MCAF, Los Angeles, Cal.  
Open Paper Stick - 27:30, Bob Randolph  
INDOOR RECORD TRIALS, Aug. 13, 1972, Cat. III  
Santa Ana MCAF, Los Angeles, Cal.  
Open Indoor Cabin - 30:00, Bob Randolph  
TULSA GLUE DCBBERS RECORD TRIALS, Aug. 26, 1972 Cat. I  
John Mabee Gym, Univ. of Tulsa, Okla. 34' 11" ceiling  
Open Paper Stick - 15:23, Stan Chilton

##### CONTEST CALENDAR

CALIFORNIA - Santa Ana  
Record Trials on Oct. 15 and Nov. 12, 1972. Contact Bob Randolph, 25145 Lawton Ave., Loma Linda, CA 92354.

TEXAS - Ft. Worth/Dallas

Indoor contest at American Airlines Hangar, GSW Airport, Ft. Worth, Oct. 1, 1972, 1 pm to 6 pm. HLG, Penny-Plane, Easy B, Indoor Stick challenge. Contact Bud Tenny, Box 545, Richardson, TX 75080 about two days in advance to be sure of site availability. Dual award system in HLG.

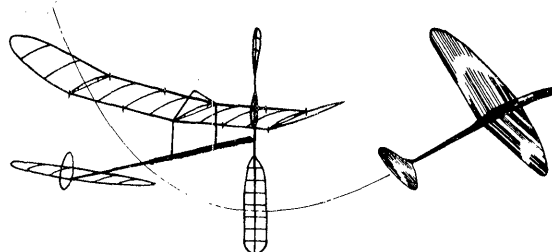
##### FAI INDOOR REPORT

Erv Rodemsky has been appointed as Program Chairman (not Team Selection Chairman) and has circulated a letter to his nominees for Indoor Program Committee members. His appointment was late and time is short, so he is faced by the need to develop a program immediately so it can be approved and announced to begin on Jan. 1, 1972. He is seeking nominations for Team Selection Chairman, and is trying to locate a "suitable" site within 600 miles of Kansas City, Mo. as spelled out in the AMA poll taken last fall after the Finals. Failure to locate such a site will automatically "decide" that a split Finals (Santa Ana and Lakehurst) will again be used. The fallacy of such a poll is that neither site may be available (at least availability cannot be guaranteed far in advance without renting the intended sites).



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

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



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

New Members!

JEFF ANNIS, MTU, Wadsworth Hall, Rm. 309E, Houghton MI 49931  
 VICTOR LARSEN, Rt. #3, Roanoke, TX 76262  
 B. H. PETTIT, c/o CDC, 23815 NW Highway, Southfield, MI 48075  
 DAVID A. ROSENZWEIG, 73 Griffin Rd., Framingham, MA 01701  
 GREGORY SIMON, 24917 Cubberness, St. Clair Shores, MI 48080

Change Of Address

Last month it was announced that Bob Gibbs' new address was Box 273, San Ramon, CA 94583. He will still receive mail at that address, but also at his new home at 161 Larkwood (same zip, etc.)

Any NIMAS member who moves can notify his friends of the new address via INAV, provided he requests this listing. It will not be done unless requested when you let us know of the new address. Of course, if you don't let us know, and they are returned here, future issues are stacked up waiting for word where to send them. Therefore, it is important to check to see if this has happened when you are more than three weeks behind on an issue.

Renewal Notice

Most of the NIMAS members are now carried on addressograph plates (only those who have moved recently or have joined in the last few months are not). In the upper left hand corner of the address block there is a two-digit number denoting the month that subscription expires. For example, "02" would mean February, while those which expire this month will have "10" in the corner.

It is extremely helpful, from both a time standpoint and from an operational standpoint if members renew automatically before the last issue on that subscription. This is especially helpful during the winter months, when large numbers of subscriptions expire. For example, in January, over 50 subscriptions expire. It takes over an hour to prepare notices for that many - which means a later bedtime for me! So, if those who have 11 in their address block will renew shortly after receiving this issue, it will be a great help!

Indoor Construction Techniques - Help!

About 18 months ago a column was started on specialized indoor construction techniques; this was as a result of several reader requests for such a topic. Several topics were volunteered for the series, but not all those who agreed to write for the series managed to do so and the effort sort of died. So, this is a request for more inputs; if you have a different or possibly unique way to solve any of the construction problems of indoor models, why don't you share them? A simple sketch of whatever apparatus or technique you use, coupled with a word description, is all it takes. It would be helpful if the sketch can be ink or high-contrast pencil, but I can usually manage to redraw the sketches sooner or later. The important thing is that the information gets out - we have too many talented and inventive people to let the hobby stagnate for lack of communication!

This Issue

This issue was indirectly delayed by six successive Saturdays of overtime, and directly by a recent 16 hour work day. Besides that, I decided that a new HLG would be flown last weekend regardless of the state of INAV; it was, and I had fun. Model output from the Tenny shop has been at a low ebb; counting that HLG, Easy '72 and a new PennyPlane, four models have happened around here since the '69 Team Selection Program. One editor of the excellent newsletter "Splatter" once decreed that no issue would be started without some building between issues. It certainly would be more fun that way - but I still hope to restore the publication date to about the 10th to 15th of each month.

FAI INDOOR REPORTNo World Record

The July '72 INAV announced a Russian Cat. I record application for a flight of 1:58:28, noting that "considerable skepticism" was directed toward the application. According to Ron Moulton, the dossier supporting the claim was not filed within the time limit; further, his conversations with Russian fliers at the C/L WCh revealed that it was probably a practical joke!

FAI Rebuttal

The June '72 INAV contained a defense of one gram FAI models by Erv Rodemsky. Shortly thereafter, Manny Radoff offered a rebuttal which never made it into INAV because of its length. The same thing was printed in full on page 8 of the July Competition News. Anyone wishing to read his remarks who has no access to CN may request a copy and furnish a stamped, self-addressed envelope.

Much of the rhetoric associated with the one gram rule has been emotional in nature, and the concept is much less popular now than before its adoption. One may conclude that at least two of the original objectives of the one gram rule have been fully successful: FAI Indoor has been made more popular, and the models are easier to transport. In fact, it is ironical that the event is now so popular that it may be difficult to find host countries willing and able to sponsor the next WCh!

US Team to Romania?

Erv Rodemsky and Bud Romak hope to enter the international meet in the salt mine at Slanic, Romania next May. They would like to have another flier to go with them, so there can be a full team from the United States. Contact Erv at 1624 Saint David Dr., Danville, CA 94526, ph. 415-837-3314; or Bud Romak, 85 Sullivan Dr., Moraga, CA 94556 ph. 415-376-4624.

CONTEST CALENDAR

CALIFORNIA - Santa Ana  
 Record Trials on Nov. 12, 1972. Contact Bob Randolph, 25145 Lawton Ave., Loma Linda, CA 92354.

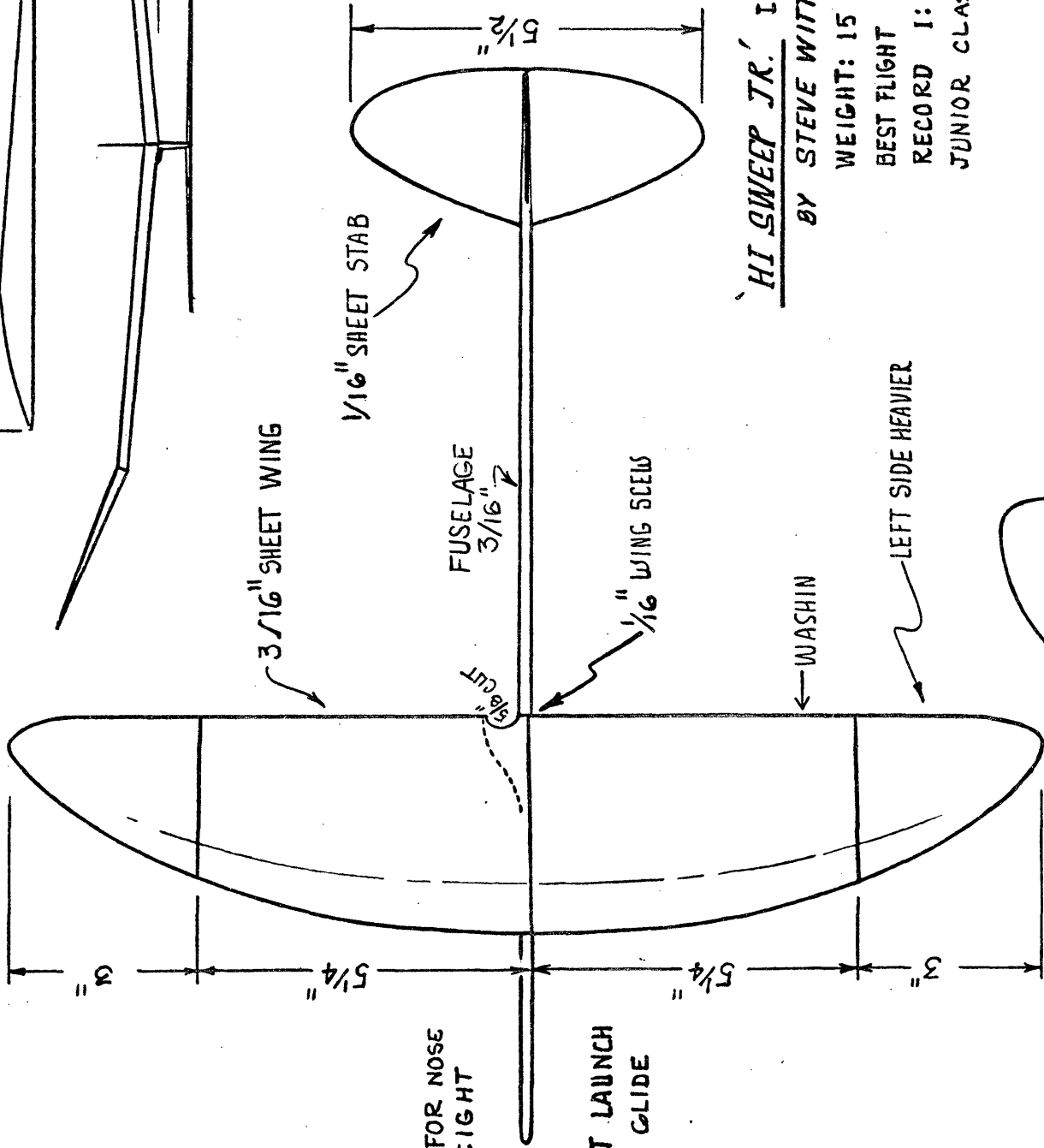
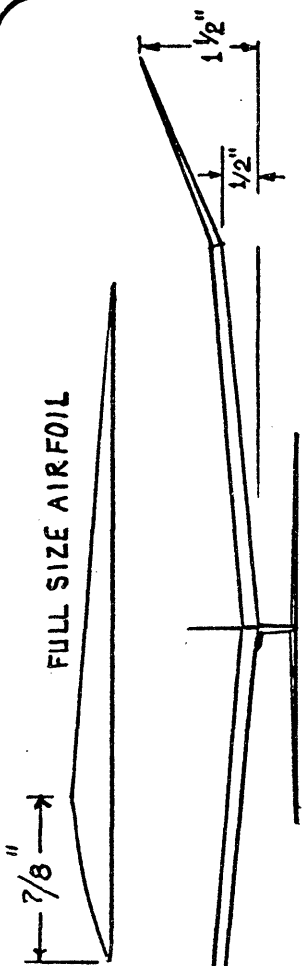
FLORIDA - Miami  
 Indoor contests jointly sponsored by Miami Indoor Aircraft Model Association and the Dade County Park and Recreation Department on Nov. 12, Dec. 10, 1972 and Jan. 14, Feb. 11, Mar. 18, Apr. 15 and May 20, 1973. The site is the Youth Fair Exhibit Building, 25' ceiling with floor 120' x 235', located at SW 107 Ave. & Coral Way, Miami. Contact Dr. John Martin, 3327 Darwin St., Miami, FL 33133 for more details.

NEW JERSEY - Union  
 Indoor flying sessions Nov. 9, Dec. 14, 1972 and Jan. 11, Feb. 8 and Mar. 8, 1973, at Livingston School, Union, NJ, 7 pm to 10 pm. Contact Dan Domina, 1229 S. Long Ave., Hillside, NJ 07208.

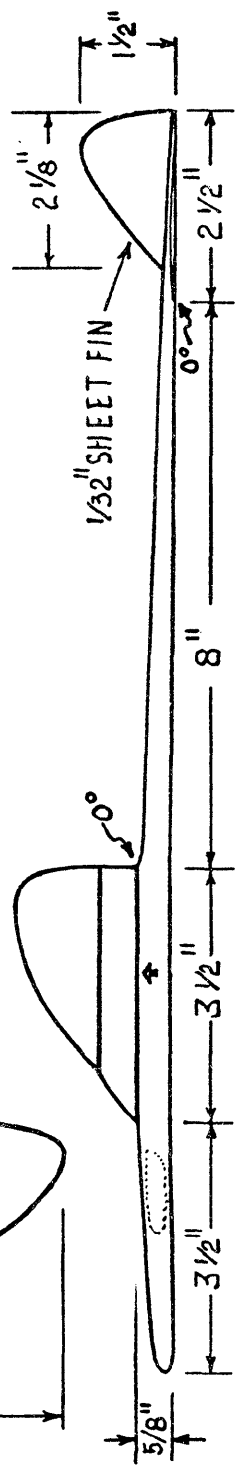
NEW YORK - Locust Valley  
 LIAMAC Cat. I Record Trials Dec. 30, 1972 and Mar. 31, 1973 at Friends Academy, Locust Valley, NY. Write J. G. Pallet, 30 Emerson Rd., Brookville, Glen Head, NY 11545, for details and a map.

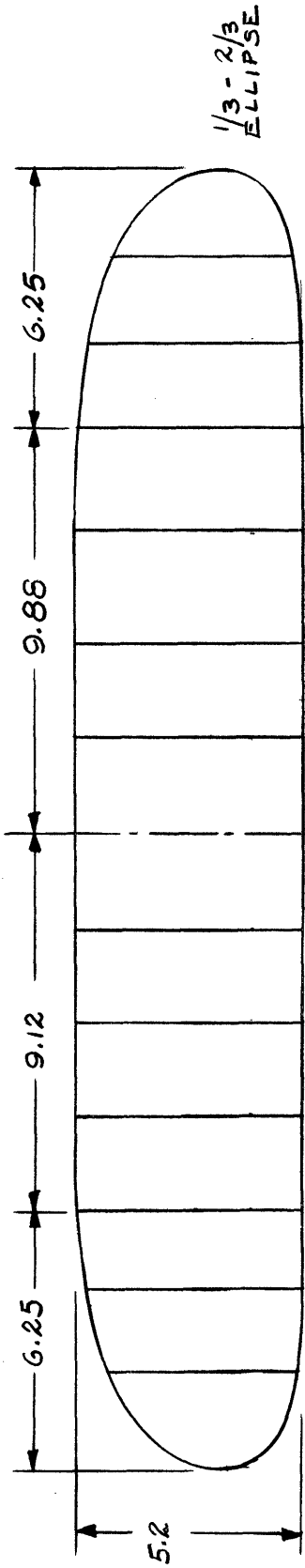
OREGON - Eugene  
 Indoor contest at Sheldon High School, Eugene, Oregon, Dec. 3, 1972, Noon to 4 pm. HLG, Easy B, Ready to Fly Gliders, Ready to Fly Rubber, Indoor Scale, plus special events. Contact Bob Staley, 4315 Pearl, Eugene, OR, ph. 686-1491.

TEXAS - Ft. Worth/Dallas  
 Indoor contest at American Airlines Hangar, JSW Airport, Ft. Worth, Nov. 12, 1972, 1 pm to 6 pm. HLG, PennyPlane, Easy B, Indoor Stick challenge, Peanut Scale. Contact Bud Tenny (214-235-4035) or Bob Wilder (214-BL3-8404) Nov. 10 or Nov. 11 pm as final check on site availability, since it is an operational hangar.



*HI SWEEP JR. IHLG. CAT. III*  
 BY STEVE WITTMAN  
 WEIGHT: 15 GRAMS  
 BEST FLIGHT 52 SEC.  
 RECORD 1:35.8 7-23-72  
 JUNIOR CLASS



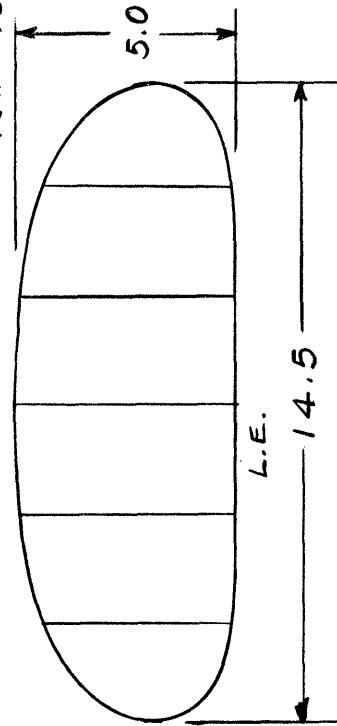


1/3 - 2/3  
ELLIPSE

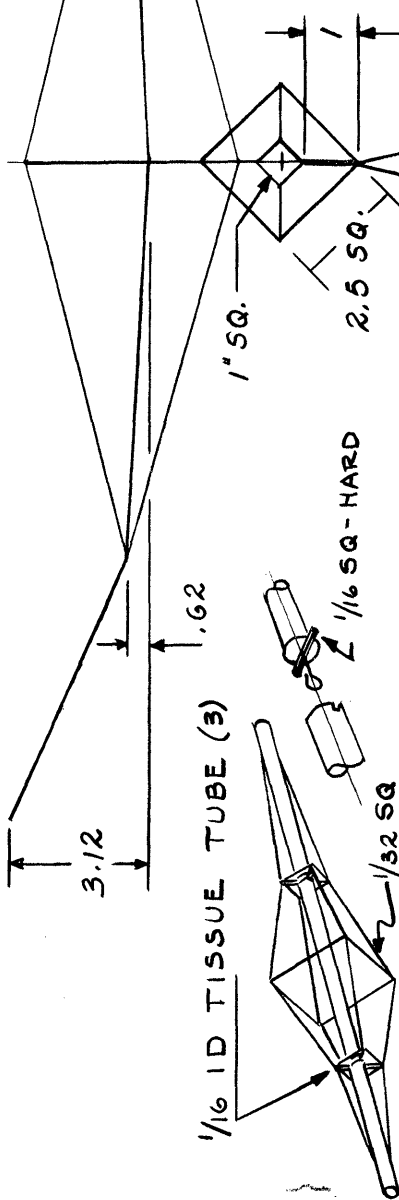
L.E.

WEIGHTS:

- PROP & PLUG - :008
- WING & BOOM - :012
- TAIL & BOOM - :009
- FUSELAGE - :012
- GEAR - :002
- TOT. - :042



L.E.



PROP - 17 1/2 D - 35 P  
- 1.88 WIDE SYM.  
MONOSPAN

NOTE - LOCATE C.G.  
& GEAR BEFORE  
BUILDING CABIN

MOTOR STICK  
11/32 ID  
.014 1/4 GRAIN  
4 3/4 #

1ST - CABIN - NATS

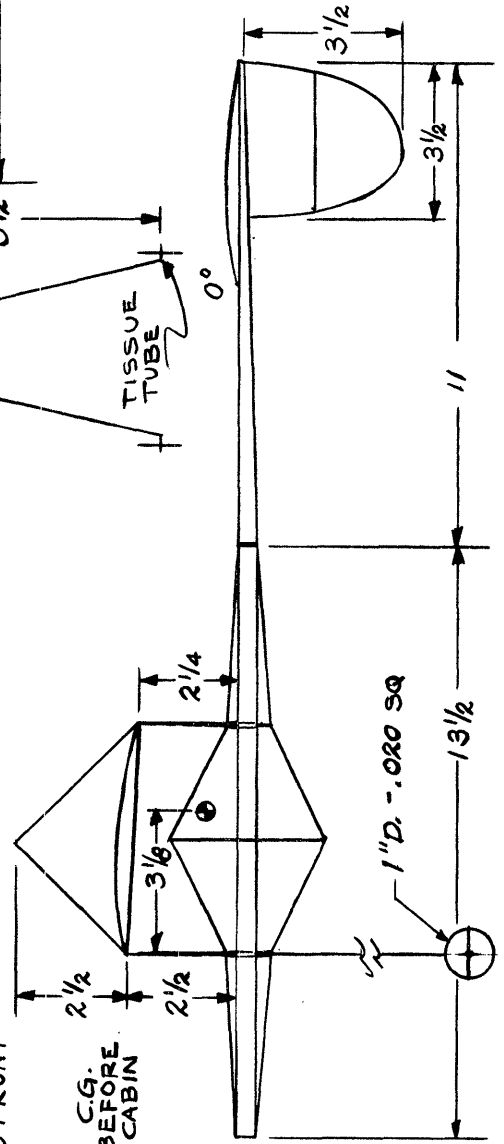
JULY 27 1971

RON PLOTZKE

23 min. 3 sec.

POWER - .061 x 17 3/4 PIRELLI  
TOTAL TURNS - 1320  
1230 TURNS USED

DRAWN BY GEO. BATIUK SR.



**CONTEST RESULTS**

**THERMAL THUMBERS INDOOR MEET**, May 14, 1972 Cat. III  
Santa Ana MCAF, Los Angeles, Cal. 150'+ ceiling

<u>Jr. HLG</u>		<u>Sr.-Open HLG</u>	
1. Dennis Cunyngnam	1:39.2	1. Lee Hines	2:41.7
2. John Magnus	1:02.3	2. Bill Blanchard	2:25.2
3. Mike Regan	1:00.1	3. Marty Thompson	2:13.5
4. Jamie Howard	0:58.5	4. Bob Isaacson	2:12.0
5. Brad Hardiman	0:30.0	5. Ron Wittman	2:11.3
<u>PennyPlane</u>		<u>Open Peanut Scale</u>	
1. Clarence Mather	13:35.3	1. Don Edson	62.7
2. Warren Williams	12:16.8	2. Frank Haynes	61.8
3. Larry Cailliau	10:47.0	3. Ed Franklin	58.7
4. Bob Gibbs	8:30.0	4. Ray Harlan	57.2
5. Kim Mather	8:00.0	5. Sal Cannizzo	55.0

**LIAMAC INDOOR CHAMPIONSHIP**, April 30, 1972 Cat. II  
Cantiague Park, Hickville, NY 50' ceiling

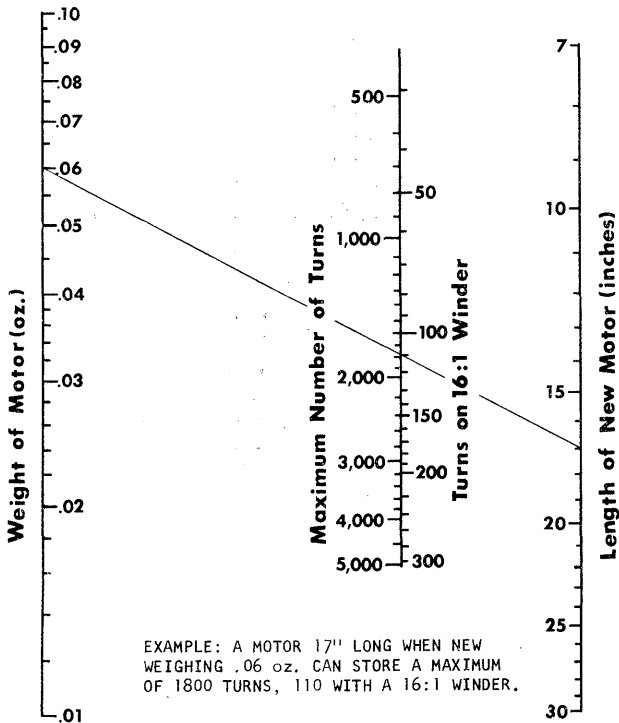
<u>Jr.-Sr. Peanut Scale</u>		<u>Open Peanut Scale</u>	
1. Chris Clemens	67.6	1. Don Edson	62.7
2. Dan Aggers	47.8	2. Frank Haynes	61.8
3. Bruce Paillet	46.8	3. Ed Franklin	58.7
4. Barry Paillet	46.7	4. Ray Harlan	57.2
5. Billy O'Connor	36.0	5. Sal Cannizzo	55.0
<u>Indoor Scale</u>		<u>Indoor Stick</u>	
1. Don Garofalov	143.8	1. Sal Cannizzo	11:31.4
2. Dan Domina	138.8	2. Dan Domina	10:59.8
3. Dave Stott	134.2	3. Pete Andrews	9:25.4
4. Joe Nuszer	134.0	4. Bob Leishman	8:53.4
5. Don Edson	134.0	5. Bill Landrum	8:51.8

<u>Jr.-Sr. Easy B</u>		<u>Open Easy B</u>	
1. Dan Aggers	6:31.0	1. Pete Andrews	9:46.4
2. Adam Menassian	6:30.8	2. Sal Cannizzo	7:50.4
3. Jerry Haynes	5:59.2	3. Don Jeter	7:30.4
4. Ron Stransky	5:49.8	4. Ray Harlan	7:28.0
5. Curtis Landrum	5:16.8	5. Jack Menassian	7:21.4

<u>Jr.-Sr. HLG</u>		<u>Open HLG</u>	
1. Ron Stransky	78.3	1. John Kaufman	82.2
2. Adam Menassian	70.6	2. Dan Domina	77.2
3. Bruce Paillet	67.0	3. Ray Harlan	76.6
4. Dan Aggers	66.2	4. Art Slater	76.4
5. Barry Paillet	65.8	5. Rich Kovaks	71.4

**PIRELLI NOMOGRAM**

The nomogram below has appeared in INAV before; it was designed by Charlie Sotich in 1962. It is intended to be used this way: make the motor to the desired length and weigh it. A straightedge between the weight (left margin) and length (right margin) will cross the number of turns on the middle scale. This method, using weight/length, is much more accurate than measuring strip width. Pirelli varies somewhat in thickness, and any stripping method has some variation, so weight/length is well worth the extra trouble to use.



**STATE OF THE ART**

Another dual offering this month - Steve Wittman's record HLG and Ron Plotzke's '71 Nats winning Cabin model. Readers may remember the cliff-hanging see-saw battle in Cabin (Aug. '71 INAV), with Richmond, Rohrbaugh and Ron snatching the honors from each other.

An interesting story backs up the glider: Steve Wittman is Ron Wittman's 9 year old son who recently decided build a glider patterned after his Dad's H1-Sweep 20. He built the glider largely unsupervised, and had trim help. One early session for practice, then a try for the record which turned up a time of 1:35.8. Very good flying for a youngster!

**RUBBER STRIPPING METHOD**

by Ted Gonzoph

It is possible to get very consistent cuts of pirelli with the proper equipment, preparation and a little practice in using the equipment. This is my way of stripping:

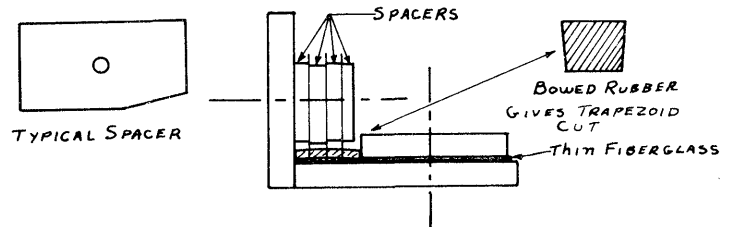
I use the Bilgri style stripper made of plexiglas, and generally take two strips from the center of 5 or 8 mm rubber, and discard the outer edges. This takes three razor blades and the blades give a smoother cut than the factory cut on the edges.

Much of the success of the method is due to using full width spacers like those shown in the sketch. They are made from special lead spacers available from print shops that do flat bed printing, or from steel rule die making shops. The spacers are available in sizes called "points" with one "point" being equal to about .015" in thickness. Intermediate rubber sizes are cut by adding similar spacers cut from .003" vinyl sheet, or other plastic which does not absorb water. Remember that the width of the cut will equal the spacer plus the thickness of one blade.

The blades are single edge steel (not stainless steel) razor blades with the doubler back removed. Each blade is typically .010" thick, so the thickness of a strip to be cut would be figured this way: assume a 4 point spacer; 4 x .015" = .060, then add .005" for half of the thickness of the blade on each side - a total of .070". To cut a .050" strip, use a 2 point spacer and three .003" vinyl spacers (total of .049", which is within the accuracy of the equipment). Important: do not use any spacer made from absorbent material. Stick to vinyl, celluloid or other plastic materials!

The gang-strip system is basically a matter of getting the spacers set for the cut needed. However, there is more - experiments since the mid-'50s show:

1. The guide side of the stripper should have two holes for locking.
2. The plexiglas base will wear ragged after several cuts due to razor impressions. I use a thin plastic or fiberglass base piece beneath the guide plate to sink the blades into, then replace it when it gets ragged.
3. The balsa wedge is important. If the guide spacing is set just right, then if the rubber gets slightly wider (pirelli can vary as much as .020" in width), the rubber will buckle and give a trapezoidal cut as shown in the sketch.
4. Use a vertical back piece with several bolt holes (I have six on 1/2" centers), then you can mount the blades in several locations without marring the base too much.
5. This I found most helpful: I wash the rubber while it is still in the skein and cut it into 50' lengths. Just before I begin to strip I place the rubber into a bucket which contains one gallon of water, a handful of Ivory Snow and about 5 ounces of glycerin. The rubber is fed into the stripper directly from the pail. The whole thing gets really sudsy, but the cut is so smooth that it's worth the mess.





# INDOOR

## NEWS and VIEWS

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

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

### New Members!

MICHAEL R. THOMAS, 141 Spenvalley Dr., Downsview, Ont.  
Canada

MICHAEL THOMPSON, 2917 Lincoln St., Lorain, OH 44052

### Change of Address

GEORGE BATIUK, 2020 Club View Dr., Huntsville, AL 35810

### NIMAS Awards

Silver Cat. II Rubber Award - 23:04.0, Bill Shailor

Jr. Gold Cat. I HLG Award - 0:24.0, Kevin Wehner

### Who Dunnit?

Recently I received an international money order - these are converted by the U. S. Postal Service to another form and sent on to me in a window envelope. It arrived the day after a 16-hour work day, and I cashed it without noting who sent it. Will the person who sent it please notify me, stating the approximate date and amount?

### Renewal Reminder

As noted last month, it saves me large amounts of time when members renew before their membership expires. Those whose mailing labels have "12" in the upper left-hand corner will find their membership expires in December, and if they send \$3.25 before time for the December issue, I can save the time of sending an expiration notice. Thanks to the many who responded last month!

### Indoor Scale

The May '72 issue mentioned a very nice beam balance by Ohaus for \$30. The model mentioned has "inflated" to \$49 - not so good! Ted Katsanis has found that the beam balance his son used in school is good "as is", and can be improved. He says: "It is a model 99161-2 Equal Arm balance, available from Prentice-Hall, Inc., P. O. Box 900, Ed. Books Div., Englewood Cliffs, NJ, 07632. I gave \$3 for a set of centogram weights from Ohaus (set #218), which will weigh over one gram to the nearest .001 g. The sensitivity of the scale is just barely .001 g as it comes with a plastic pointer. The pointer lowers the CG of the arm, so if a balsa pointer is substituted the sensitivity would increase considerably. The scale has hardened steel knife edges for the center pivot and weighing pans, with an agate bearing for the center pivot. The originally mentioned Ohaus balance has magnetic damping, which could be easily added to this scale also."

### New Indoor Dealer

Carl Jaeger, 2809 Casden Circle, Colorado Springs, CO 80909, has put in a complete line of Micro-X supplies. Address queries to: Duration, 2809 Casden Circle, Colorado Springs, CO 80909.

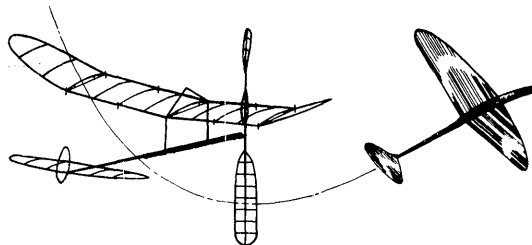
### New Materials

Dan Domina has noted that the center strand of undamaged multi-strand control line wire is quite small and very nearly straight. For example, from .018" diameter stranded cable you can get a strand .005" diameter by untwisting the cable.

### Financial Report

Last year, NIMAS reached a decision point on costs vs. services which resulted in overwhelming reader response in favor of 25% increase in dues - to \$3.25 per year. Also, a large number of people sent donations ranging from 50¢ to dollars, to make up the 1971 deficit. As a result, the income for 1972 amounted to \$899.26. With expenses up to \$865.49, the \$33.77 remaining does well toward erasing the deficit. The expenses break down as follows:

Printing + office supplies, misc.	\$455.85
Newsletter postage	324.74
Postage for correspondence	84.90
	<u>\$865.49</u>



Other statistics are as follows: newsletter circulation was 330 average, up 2 2/3% from 1971. Incoming mail amounted to 609 pieces, with 676 pieces outgoing. The lower rate of correspondence is doubtless a reflection of slower response on my part. If I owe you a letter, I hope to get it off soon! I've spent more time earning a living lately, which reduces time for correspondence. Thanks to all of you for another good year!

### SPECIAL INTERNATIONAL ISSUE

It has become traditional for the November issue to be dedicated to friends in other countries. This year, with happy recollections of the WCh, it has a special meaning to me. I renewed acquaintance with many of you and met so many more - my best wishes to all of you.

### FAI INDOOR REPORT

#### One More Delay - A Minority Report

The latest word from the long-overdue FAI Program for next year (to pick the 1974 Team) is that AMA HQ requires yet another poll. This poll will probably be in your hands by the time you receive this newsletter - but only if you participated in the last Program. In other words, even if a newcomer might be interested in entering the new Program, he will have no say in its formation.

Some background: On p.7, Dec. '71 Competition News, it was announced as firm AMA policy that participants in the previous program will be polled "as soon as possible after completion of a program" to determine whether the site for the next program will be single (central) or at two or more sites. This poll was made, and the Feb. '72 CN announced that "a single suitable site will be sought within 600 miles of Kansas City."

The results of program planning by Rodensky and the Indoor Committee (Andrews, Stoll, Tenny and Matner) showed less than unanimous accord over the central site issue. Now, in clear violation of all previous announcements and "established policy", another poll will be taken by AMA HQ - who established this policy in the first place.

As a result, program planning will be delayed beyond Jan. 1, 1973, and announcements of the details will be far beyond that time. This violates more established policy which specifies that Team Selection Programs will begin not later than Jan. 1 of the year prior to the next WCh. In our case, the Program must begin Jan. 1, 1973. Erv Rodensky volunteered for his post fully two months before his appointment. If he had been promptly confirmed, we would still have time for this poll.

It is long overdue for AMA HQ to be taken out of the "decision loop" affecting FAI Programs, since this duty is not spelled out in the By-Laws. If that is not reason enough, take any criteria you wish - knowledge, competence, results, experience - AMA HQ has demonstrated an abysmal lack of stability needed to make coherent and meaningful decisions. Stated another way, any "expedient" decision that comes to mind is immediately implemented with no concern for short- or long-term effects. No one in the present "decision loop" has competitive or administrative experience in FAI FF or Indoor Team Selection matters. Further, and worse, no one in the loop is the least bit accountable to the membership, even indirectly. It is time for a change.

To end on a positive note: Things are what they are, and any possible change must be reserved for future programs if we are to have a Team for 1974. The best thing we all can do is to return the ballots promptly - 100% of us, whether we plan to enter the next Program or not. If the ballots can be 100% returned before the Dec. 15 deadline, we can at least salvage that much time.

### Greetings to Indoor WCh Entrants

The message reproduced below was sent by Boyd Felstead to the WCh, to be read to the participants at the victory banquet. It arrived too late, so perhaps this issue of INAV is a suitable forum:

CONF. P. 2

"After many trials and tribulations my model box should be on its way. I could write a book on the contents of the box, the highlight being when our cat hopped onto the dining room table and walked all over model parts - resulting in a rebuilding job in time not available.

Whether the box will arrive in time, whether the models will be in good condition, whether they will fly - all are unknowns. However, I am pleased to join you as an entrant, fully conscious that my 20 years on indoor inactivity leaves me well behind you established experts.

I would like to pay tribute to many and if I overlook anyone it is simply for lack of time and due to fatigue.

First my proxy, Manny Radoff; without his enthusiasm and encouragement I would not have considered entering - my work and home environment are not conducive to modeling just now. His many letters of advice and suggestions took much time and effort and were very much appreciated.

My thanks to many who freely gave advice and suggestions. In particular, Ron Plotzke, Erv Rodemsky, Tom Vallee, C. V. Russo, Charlie Sotich, Ernie Kopecky, Bob Platt, Bill Bigge, Reg Parham, Bob Champine, Bud Tenny, Al Rohrbaugh, Bud Romak, Clarence Mather and Bob Randolph. Also, Laurie Barr, who kindly offered to pick up my box despite all his other duties at the WCh.

The fact that indoor flying is now flourishing can be attributed to the die-hard enthusiast. People like Bud Tenny, who has published Indoor News And Views for over ten years, and the indoor suppliers: Lew Gitlow, who only recently retired after many years of wood cutting; Jerry Skrijanc, who continues to make available good materials, and more recently, Ron Plotzke and Erv Rodemsky have joined the ranks of suppliers to provide quality products.

My regrets to Joe Bilgri, who for personal reasons had to forego his place on the U.S. team - but welcome to Sal Cannizzo in Joe's place.

My good wishes to European fliers and other entrants not mentioned above. While I have not corresponded with you, I have followed your progress with great interest.

Much has been said on the new rules. The weight rule has been nullified by more wing area for low wing loading. I personally think we should keep the 65 cm span and forget the weight rule unless wing area is limited. If a modeler can build lighter why stifle that ability?

Finally I echo my sentiments expressed at the first World Championship in 1961 - I hope the conditions were good and that the best man won. Good luck to you all!"

#### CONTEST CALENDAR

##### FLORIDA - Miami

Indoor contests jointly sponsored by Miami Indoor Aircraft Model Association and the Dade County Park and Recreation Department on Dec. 10, 1972 and Jan. 14, Feb. 11, Mar. 18, Apr. 15 and May 20, 1973. The site is the Youth Fair Exhibit Building, 25' ceiling with floor 120' x 235' located at SW 107 Ave., and Coral Way, Miami. Contact Dr. John Martin, 3327 Darwin St., Miami, FL 33133 for details.

##### NEW JERSEY - Union

Indoor flying sessions Dec. 14, 1972 and Jan. 11, Feb. 8 and Mar. 8, 1973 at Livingston School, Union, NJ, 7 pm to 10 pm. Contact Dan Domina, 1229 S. Long Ave., Hillside, NJ 07208.

##### NEW YORK - Locust Valley

LIAMAC Cat. I Record Trials Dec. 30, 1972 and Mar. 31, 1973 at Friends Academy, Locust Valley, NY. Write J. G. Paillet, 30 Emerson Rd., Brookville, Glen Head, NY 11545, for details and a map.

##### OREGON - Albany

Indoor contests Jan. 13 and Feb. 11, 1973 at South Albany High School, 3705 S. Columbus St., Albany, OR. Contact Bob Stalick, 1120 Shady Lane, Albany, OR 97321, ph. 928-8101 for details.

##### OREGON - Eugene

Indoor contest at Sheldon High School, Eugene, Oregon, Dec. 3, 1972, noon to 4 pm. HLG, Easy B, Ready to Fly Gliders, Ready to Fly Rubber, Indoor Scale, plus special events. Contact Bob Staley, 4315 Pearl, Eugene, OR, ph. 686-1491.

#### INTERNATIONAL CONTESTS

##### 1972 Championship of Budapest, May 14, 1972, 14.9 m site

1. Antal Egri	44:25 (Two flights)
2. Andras Ree	42:16
3. Geza Varszegi	38:51

##### 1972 Hungarian National Championships, May 27-28, 1972 Assembly Hall, Kossuth University, Debrecen - 98'

1. Andras Ree	28:36	29:42	58:18
2. Zoltan Ocsody	28:24	29:32	57:56
3. Antal Egri	26:30	27:50	54:20
4. G. Buzady	25:42	27:17	52:59

##### Budapest Aeroclub Annual Meet, June 18, 1972, 14.9 m site

1. Zoltan Ocsody	27:01 (best one of four)
2. Andras Ree	25:04
3. Antal Egri	22:47

##### Fifth International Contest, Brno, Czechoslovakia July 15-16, 1972 Trade Hall in Brno

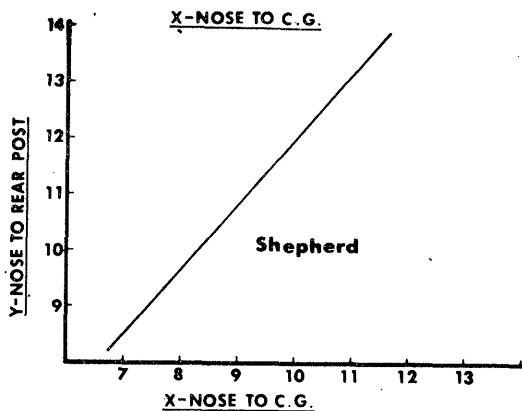
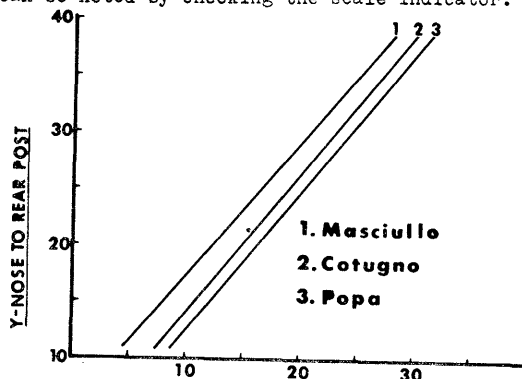
1. K. Rybecky Czechoslovakia	32:53	33:28	66:21
2. E. Clapala Poland	30:37	31:12	61:49
3. Aurel Popa Romania	28:42	30:46	59:28
4. R. Czechowsky Poland	30:55	27:40	58:35
5. A. Valenta Czechoslovakia	27:55	30:17	58:12
6. R. Cerny Czechoslovakia	27:24	28:56	56:20 (tie)
7. A. Moraru Romania	28:33	27:47	56:20 (tie)
8. E. Chlubny Czechoslovakia	27:34	28:01	55:35
9. L. Koutny Czechoslovakia	25:46	29:37	55:23
10. J. Kalina Czechoslovakia	26:09	29:04	55:13
11. Andras Ree Hungary	27:06	27:26	54:32
12. D. Chlubna Czechoslovakia	25:43	28:16	53:59
13. Z. Ocsody Hungary	27:01	26:20	53:21
14. J. Jirasky Czechoslovakia	26:22	26:20	52:46
15. H. Pernica Czechoslovakia	23:58	19:24	43:22

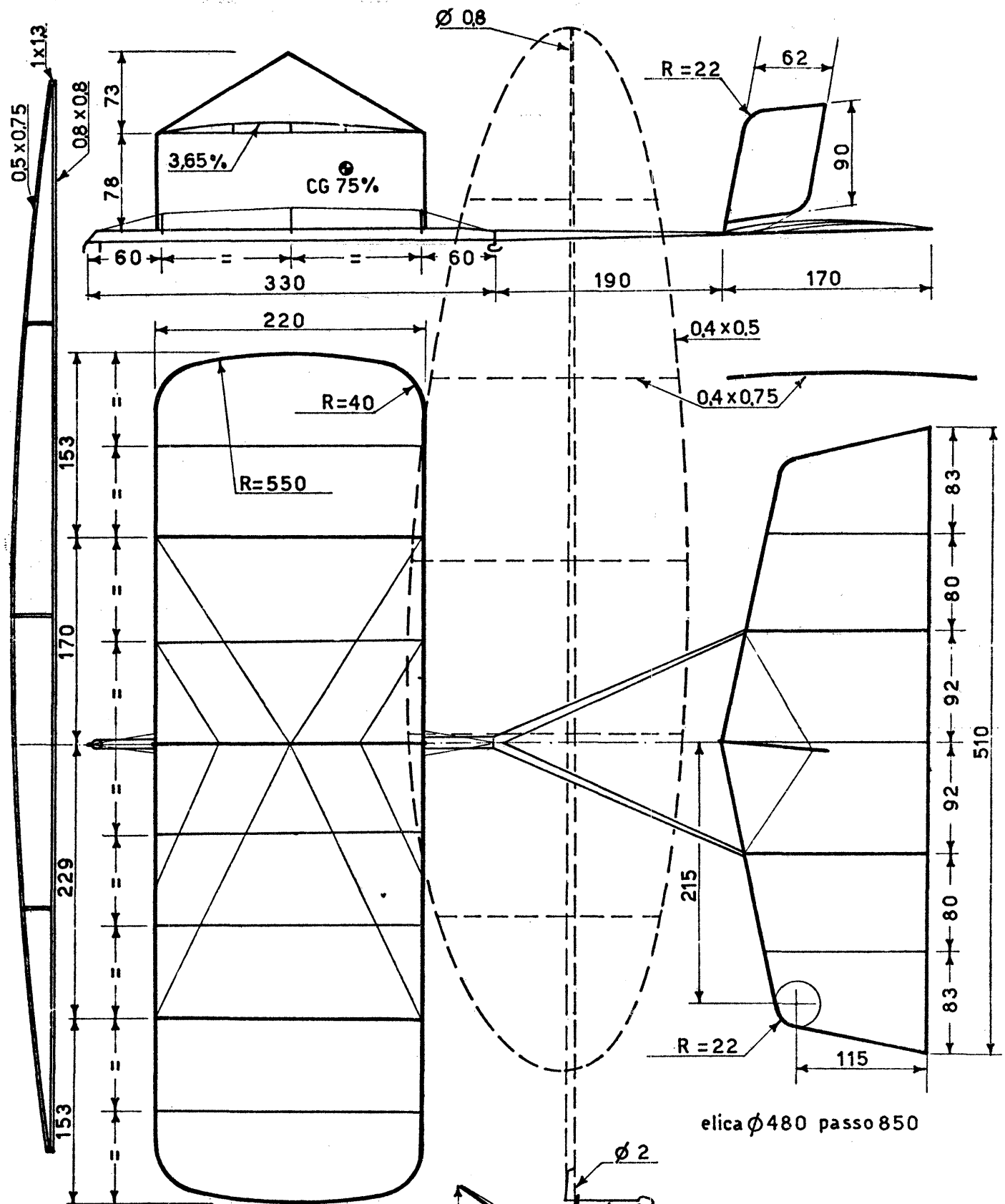
#### STATE OF THE ART

This offering of European models was chosen out of quite a few on hand - with more to come in future issues. Of the four, Martin Shepherd's model and Cotugno's twin boom model were WCh entries. It is possible that Germano Masciullo flew models of this design at the WCh, but this three-view was on hand before then. Finally, Popa's model won the 1971 Hadju-Cup contest in Debrecen, Hungary. It has two special features - the antenna on top presumably helped prevent the "down-the-arch kamakazi" which caught so many models at the 1966 WCh. Also, note that the one gram model carried only .85 g of very good rubber to make 57:50 two flight total! That is very good time in that site for any model, let alone one gram models.

The CMOS diagrams below were drawn for 0% margin as usual. Based on information furnished, or on measurements scaled from the drawings, the models were actually flown with these stability margins: Cotugno - -5%; Shepherd - +4.25%; Masciullo - -6.8%; and Popa - -10.5%. Popa's model should have been fairly touchy, but combined with the antenna, this may well have given superior ceiling touch characteristics in a very difficult site.

A note on the drawings: all the dimensions except on Marty Shepherd's model are in metric units (ditto for the CMOS diagrams), and the blade and airfoil outlines on Cotugno's drawing will be slightly less than full size, as can be noted by checking the scale indicator.



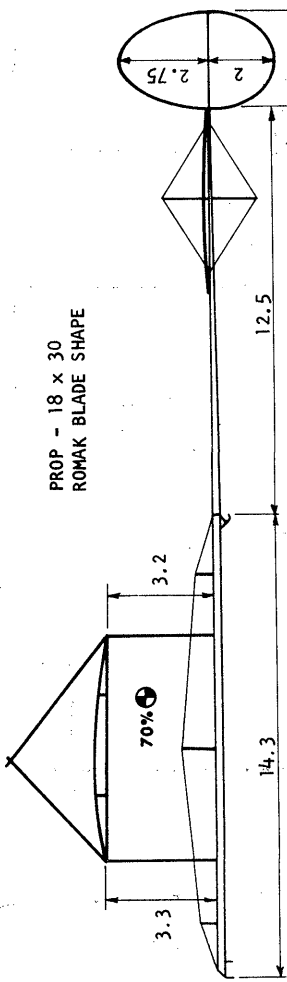


Indoor FAI  
 di  
 Carlo Cotugno

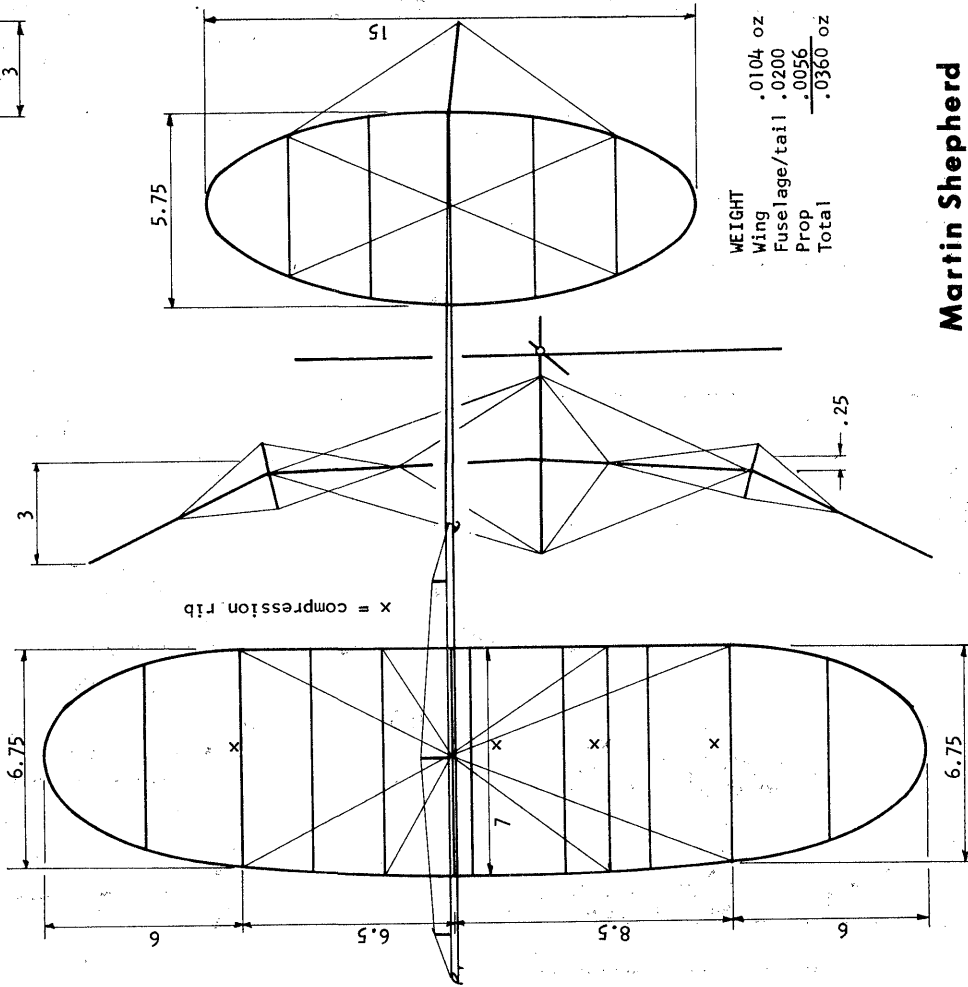
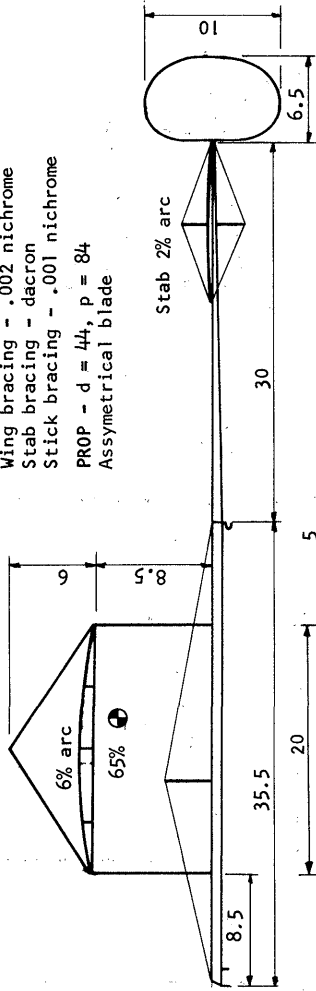


VISTO DA DIETRO

PROP - 18 x 30  
ROMAK BLADE SHAPE



Wing bracing - .002 nichrome  
Stab bracing - dacron  
Stick bracing - .001 nichrome  
PROP - d = 44, p = 84  
Asymmetrical blade

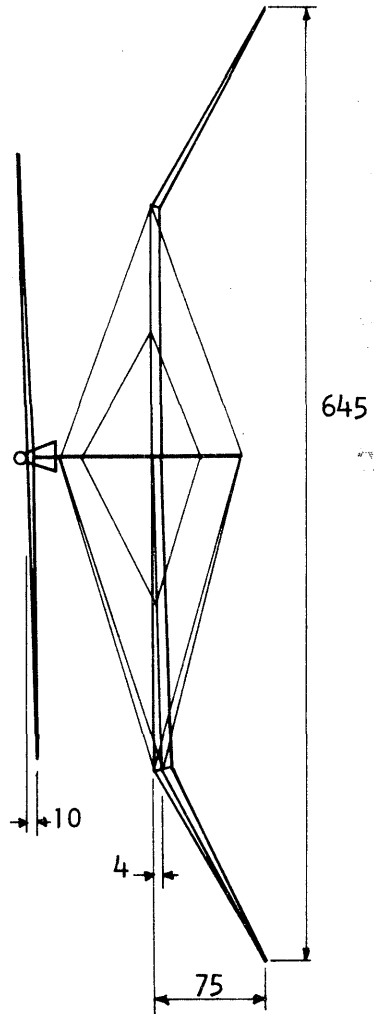
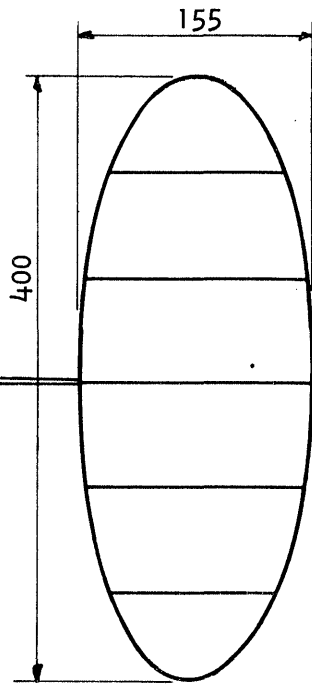
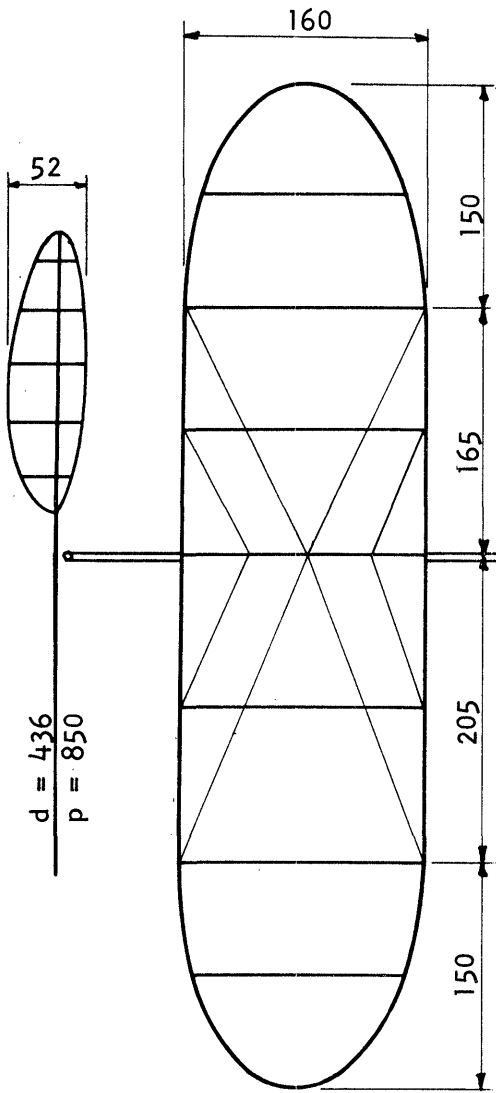
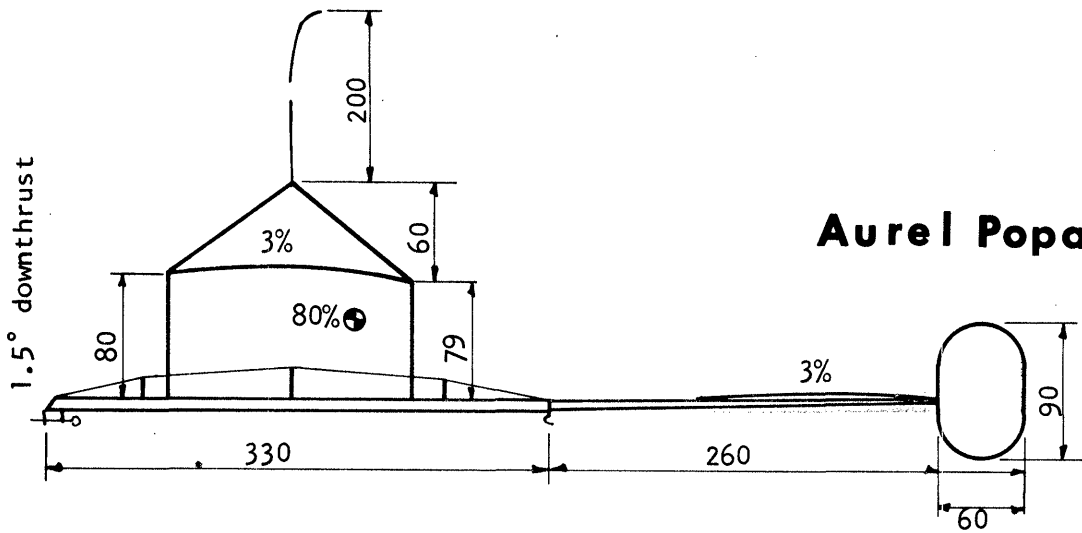


WEIGHT	
Wing	.0104 oz
Fuselage/tail	.0200
Prop	.0056
Total	.0360 oz

Martin Shepherd

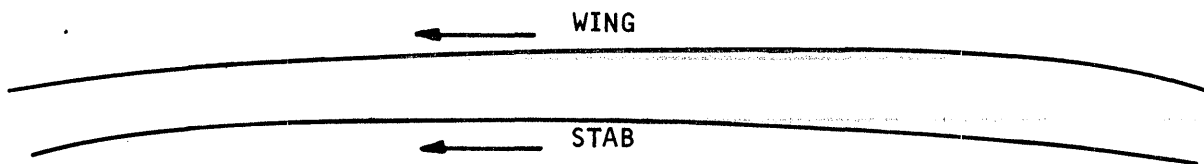
Germano Masciullo

# Aurel Popa



WEIGHT

Wing	0.250 g
Fuselage/tail	.610
Propeller	0.150
Antenna	0.020
Model wt.	1.030 g
Rubber	0.850
	<u>1.880 g</u>



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

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

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

New Members!

CHARLES RIDDLE, P O Box 3075, San Francisco, CA 94119  
DONALD M. WATSON, 4515 Parker, Dearborn Hts., MI 48125

Honorary Members

WIM H. BEEKMEYER, Roemer Visscherstraat 27, Vlaardingen,  
Holland

Merry Christmas!

Many of you have already sent us Christmas cards and good wishes. Thank you for remembering us! I wish it was possible for us to send each of you a card, but there just isn't time enough. So, we wish all of you health and happiness for this season and for the coming year.

Recent Publications

The Jan. '73 Model Airplane News contains a report on the 1972 Indoor World Championships, written by Erv Rodemsky. This is a very interesting report with excellent pictures, and Erv's writing style is crisp and enjoyable. Thanks to Erv for a very good job, and thanks to M.A.N. for being the only magazine which cares.

What Do You Want?

Several INAV columns appear in every issue, but there are many more which appear on an occasional basis - as the information is available or as particular issues have the needed space to handle a particular topic. About every two years the INAV readers are asked to comment on these topics and to suggest others. So, please review the list below, suggest additions or deletions and send in anything you think would be of interest to INAV readers.

**QUESTIONS AND ANSWERS** - Readers ask questions which are then answered by the editor or experts willing to expound on that particular topic.

**HINTS AND KINKS** - Handy hints, with or without sketches, shared by the readers. Can deal with any aspect of indoor building and flying.

**CHANGE OF PACE** - Fun projects like mini-gliders, fly powered models, etc. that are a change from the serious aspects of indoor duration flying.

**SPREAD THE WORD** - Clubs or individuals share the results and methods of directing public attention to the many benefits of indoor flying.

**LOW CEILING FORUM** - Readers share their secrets, successful experiments, etc. in solving the special problems of getting maximum duration in low ceiling sites.

**THE LAB** - Reports of, and speculation about, scientific and semi-scientific measurements and experiments of the problems of attaining the most performance from indoor models and materials.

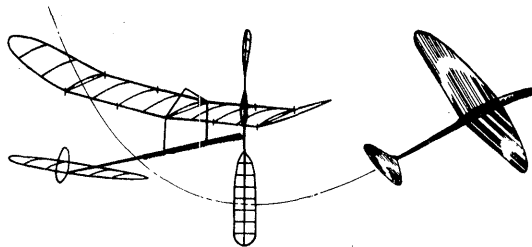
**PROP FORUM** - Theory and practical experiments on props are reported to encourage more prop development.

**A LOOK AT YESTERYEAR** - Trivia and tidbits relating how it "used to be" during the formative years of Indoor.

**NEW MATERIALS** - Reports of new and better materials which make possible better indoor models.

**DESIGN FOOTNOTES** - Discussion of design principles and theory, intended to foster systematic and scientific development of better indoor models.

**INDOOR FLYING SCALE** - This column has suffered greatly for lack of material. Several advisors have wrestled with the problems of the INAV format in handling Scale info within the space and publication limitations which are present. It is anticipated that this can become a fairly regular column of Scale hints and ideas, to be edited by a volunteer.

FAI INDOOR REPORTCIAM Actions

The 1972 Plenary meeting of the FAI CIAM took place in Paris, France Nov. 30-Dec. 1, 1972. The following statements summarize actions taken at the meeting which affect indoor activity:

A proposal which would have had entry countries share the expenses of FAI Jury, Judges and timers was defeated. The major effect of this proposal would have been to help indoor WCh host countries with expenses, since the relatively fewer entrants reduces the financial base of indoor WCh's.

A proposal to require identification of indoor models, using indelible colored inks with different colors for each team member, was passed. Presumably this would affect only WCh teams.

A proposal which would have limited future indoor WCh meets to sites lower than 100' (approx.) was defeated. This concept was first discussed in 1966 after the beautiful success of the 1966 WCh at Debrecen; however the idea was to "encourage choice of lower ceilings" rather than requiring the lower ceiling. Where the mandatory portion of the proposal originated is not known, but it is small wonder that a mandatory change was defeated. However, discussions at the 1972 WCh's seemed to indicate that the idea of encouraging lower sites was acceptable.

Whither Goest The Program?

After the last issue went to press, there was indication that perhaps another ballot would not be circulated at this time. In any event, there has been no word from AMA HQ or Erv Rodemsky about what is transpiring. Due to the extreme lateness of the season, AMA HQ will furnish program info to all who send a stamped, self-addressed envelope to HQ. Otherwise, the earliest that program info can be available (other than thru INAV) is late Dec. '72 in Competition News (if the program is decided then), or in January club/officer mailings from AMA and the Mar. '72 AAM (out in February).

CONTEST CALENDAR**FLORIDA** - Miami

Indoor contests jointly sponsored by Miami Indoor Aircraft Model Association and the Dade County Park and Recreation Department on Jan. 14, Feb. 11, Mar. 18, Apr. 15 and May 20, 1973. The site is the Youth Fair Exhibit Building, with 25' ceiling and 120' x 235' floor, located at SW 107 Ave., and Coral Way, Miami. Contact Dr. John Martin, 3327 Darwin St., Miami FL 33133 for details.

**MISSOURI** - Kansas City Area

Indoor contest on Feb. 18, 1973 at Richard Gebour AFB, Mo. (Grandview, Mo.), 8 am to 5 pm. AMA Cub, HLG, Indoor Scale, PennyPlane, Indoor Stick. Contact Roger Schroeder, 4111 W. 98th St., Shawnee Mission KS 66207.

**NEW JERSEY** - Union

Indoor flying sessions Jan. 11, Feb. 8 and Mar. 8, 1973 at Livingston School, Union NJ, 7 pm to 10 pm. Contact Dan Domina, 1229 S. Long Ave., Hillside NJ 07208.

**NEW YORK** - Locust Valley

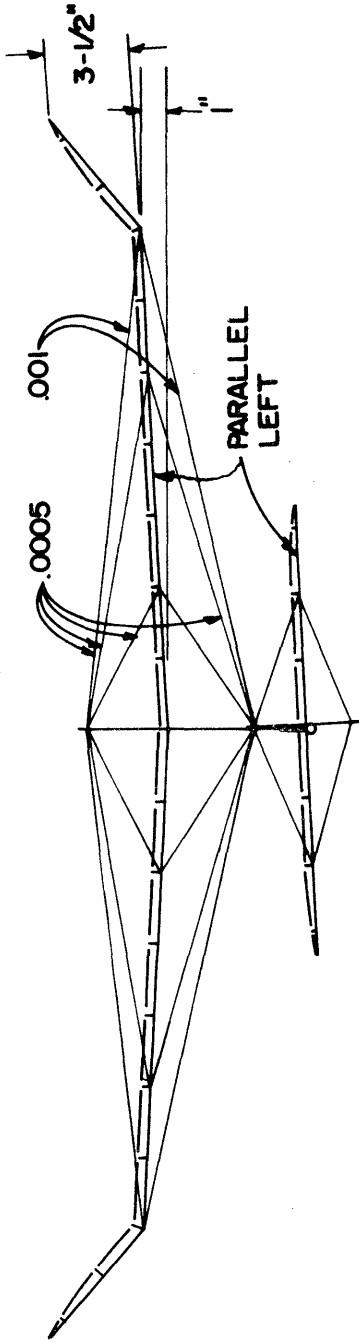
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Indoor contests Jan. 13 and Feb. 11, 1973 at South Albany High School, 3705 S. Columbus St., Albany, OR. Contact Bob Stalick, 1120 Shady Lane, Albany OR 97321, ph. 928-8101 for details.

**VERGINIA** - Hampton

Indoor contest on RT at Hampton School, Hampton, VA on Dec. 30, 1972. Contact Hal Crane, 4002 Buchanan Dr., Hampton VA 23369 for details.

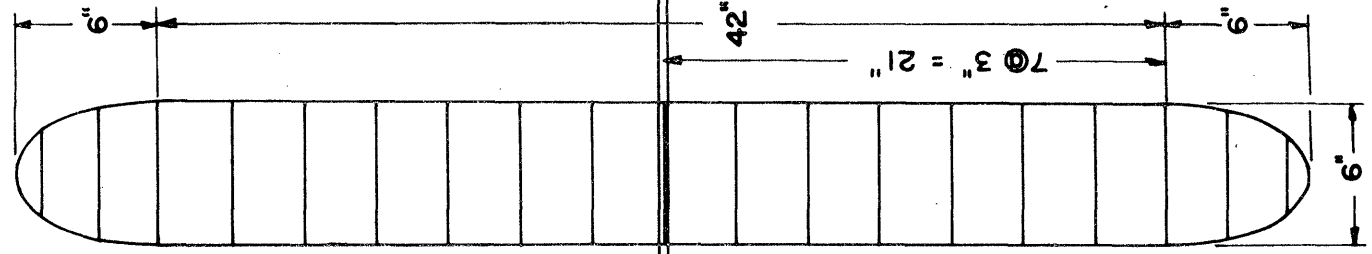


**HIGH ASPECT "D"**

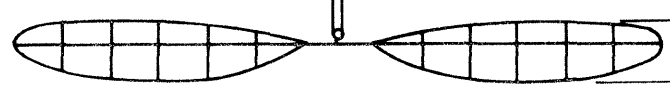
51" PROJ.  
 295.55<sup>□</sup>"  
 WING .0264 OZ.  
 STICK ASSY. 0376 OZ.  
 PROP .0122 OZ.  
 TOTAL .0762 OZ.

.085 X 19 PIRELLI  
 R.P.M. 32 CRUISE  
 36 CLIMB

DESIGN BY A. ROHRBAUGH  
 DRAWN BY S. G. *ambler*

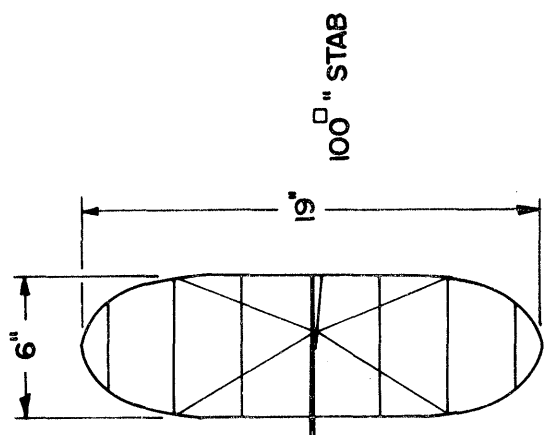


3/16" WASHOUT

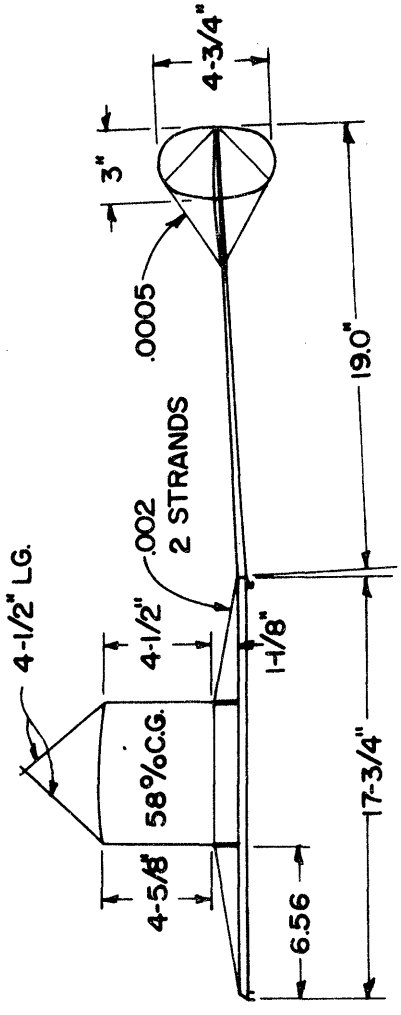


27D. 52P

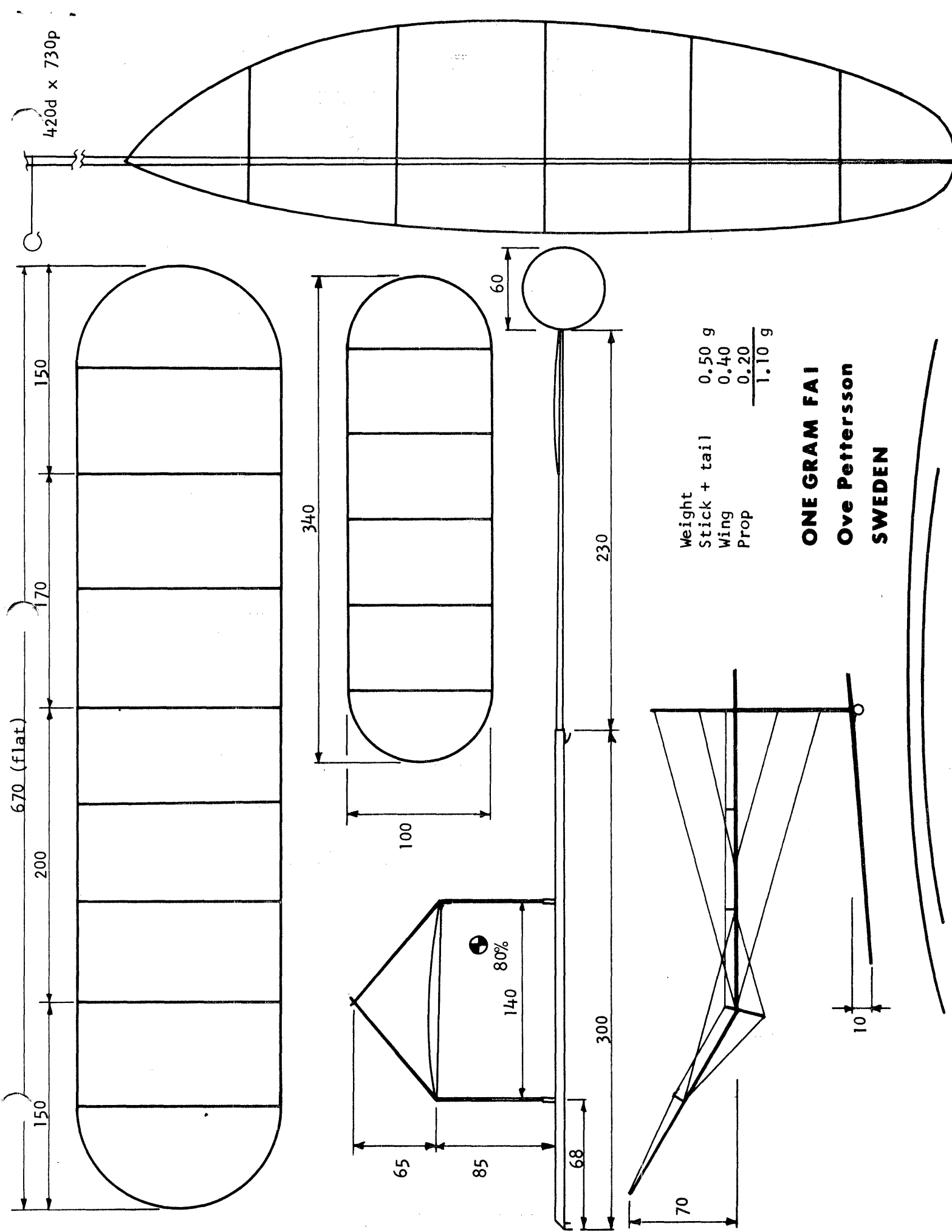
3/16" WASHIN



STAB & WING  
 AIRFOILS 3/16"  
 ARC



STICK .020 .017 .020 X 1-1/8" PLUG IN BOOM 1/16" D.  
 .020 M.W. SHAFT, R.HOOK & DBL. BRG.





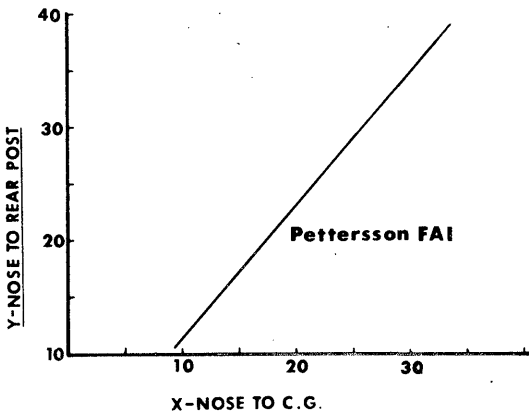
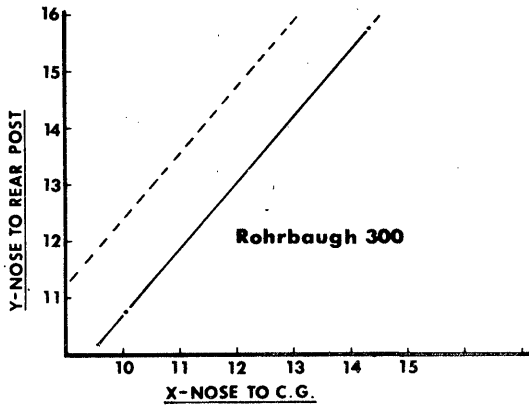
**STATE OF THE ART**

Al Rohrbaugh's "High Aspect D" caused a sensation at the '72 Nats, and is an interesting study in model development. Of the model, Al says, "As reported by Janke, this high A/R 300 has very slow RPM and great potential. Using .085 x 19 pirelli, and considering turns used vs. RPM, it is interesting to speculate on maximum time. I've flown the model only a few times but I feel that it will fly on good .080 rubber. The weight can be reduced, but at the time it was built the span and general size posed structural problems which were new to me. We who were watching the Nats flight (27:28.6; 3rd place) estimated the altitude as between 45' and 50'. The next flight with turns sufficient to win hit the lights and that was it. It's an interesting model, worth the design and building effort."

Curtis Janke later related that everyone was cheering Al on by urging him to "get it up". However, Wayne Zink, Al's building buddy, said "He can't get it above the lights - it can't get between them!"

The second model featured this month is Mk. II of Ove Pettersson's One Gram FAI. This model holds the Swedish national record for Cat. I. Sweden's activity is slowly growing, and it is hoped that Swedish teams will begin to participate in future European meets.

The CMOS diagrams below are for 0% margin; Rohrbaugh's 300 was flown at +26% margin, and Pettersson's FAI was set up at about 0%.



**TOP TEN EASY B**

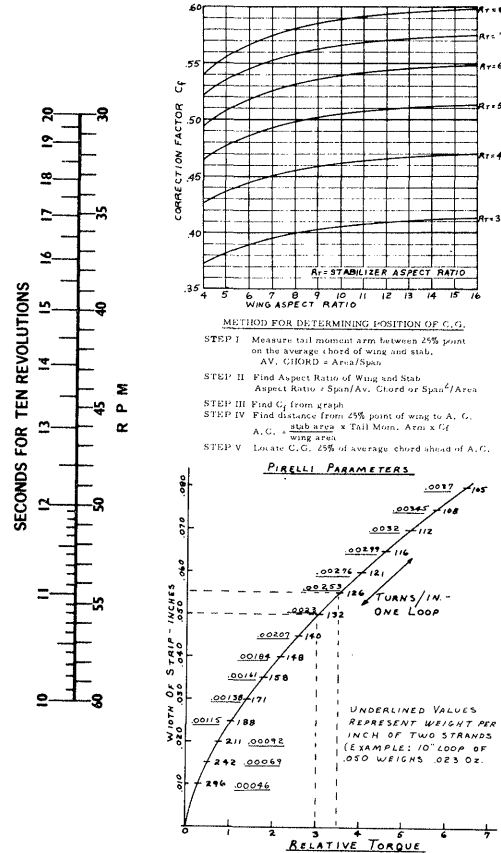
	Time	Ceiling	Fudge	Score
1. Dick Hardcastle	585	18'	1.394	815.5
2. Clarence Mather	636	22.3'	1.253	796.9
3. Ted Gonzoph	626	26'	1.16	726.6
4. Stan Chilton	540	20'	1.323	714.4
5. Bob Platt	529	20'	1.323	699.8
6. Hal Crane	492	20'	1.323	651.0
7. Bill Langley	491	20.5'	1.306	641.7
8. Dick Starks	451	20.5'	1.306	599.0
9. Jim Bennett	545	31'	1.063	578.3
10. Gordon Wisniewski	480.2	20'	1.323	555.9

**TOP TEN CEILING DODGERS**

1. Stan Chilton	1115	35'	1.0	1115
2. Tom Vallee	810	20'	1.323	1071.6
3. Hal Crane	682	20'	1.323	902.3
4. Dick Hardcastle	602	23'	1.234	742.9
5. Hewitt Phillips	528.2	20'	1.323	698.8
6. Howard Haupt	456	22'	1.261	574.5
7. Harry Cook	471	26'	1.16	546.4
8. Bill Langley	421	27.5'	1.128	474.8
9. Jim Davidson	280	13'	1.64	459.2
10. Gordon Wisniewski	300	20'	1.323	396.9

**NIMAS CHARTS**

Several years ago, NIMAS Charts of various designs were made available in the form of metal plates which are almost indestructible. Three of these chart designs are shown below - Pirelli Parameters, CMOS Design Chart and an RPM calculator. Several of the RPM calculators are on hand now, and the others can be made available if enough people should want them. In addition, the Pirelli Nomogram on page 4 of Oct. '72 INAV could be made available. If you are interested in these, drop a card and let us know. The prices are: RPM Chart - 70¢, Pirelli Parameters - \$1.10 and CMOS Chart - \$1.25. Projected price for the Pirelli Nomogram would be about \$1.25.



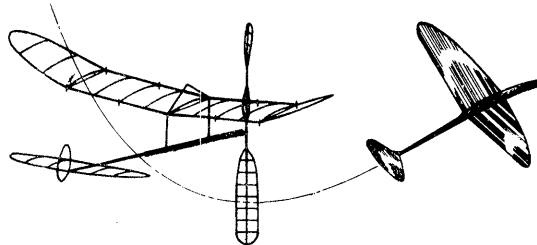
**A LOOK AT YESTERYEAR**

In "Beginning To Fly - The Book of Model Airplanes", Ray Harlan found rules for the Stout Indoor Contest. It is of interest to compare these 1928 rules with modern indoor rules for Indoor Stick:

- No restrictions on the design of the model except that it shall have a distance between the propeller bearing and the motor hook, fastened to the opposite end of the motor stick, not to exceed fifteen inches.
- All models must be hand-launched, and the only motive power be derived from the use of rubber bands.
- The contest will be for duration. A contestant will be allowed a total of three official flights. He will be accredited with the greatest elapsed time made in any one of his three flights.
- A contestant will be allowed a maximum of three models, and he may use any or all to complete his official three flights.
- No contestant shall launch his model before receiving the launch-signal from the official starter. Any contestant doing so will be disqualified. All contestants must have their models ready for examination by the officials fifteen minutes before the starting time of the contest.
- Each contestant will draw a number, giving his place in rotation. He will be allowed two minutes within which to launch his model. Should he fail to launch his model in the time allowed he must withhold that official trial until his next turn in line and a delayed flight will be charged against him.
- Any flight under fifteen seconds and every failure to fly in turn shall be considered a delayed flight. Three delayed flights will be considered an official flight.
- The finish time will be taken when the model strikes or lands on any object preventing further flight. (Rules 7 thru 10 deal with contest administration.)
- Minimum number of contestants eight. Maximum number of contestants twenty-five. (This applies only to the finals.)

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

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

\*\*\*\*NATIONAL INDOOR MODEL AIRPLANE SOCIETY\*\*\*\*New Members!

JOE EMONS, 2201 State, Alton IL 62002  
 EDWARD J. GUMELL, 5641 Willow Terrace Dr., Bethel Park PA 15102  
 DAVID HAUGHT, Rt. 2, Box 10, Coeur D'Alene ID 83814  
 A. F. HOLGERSON, 2724 Hickory Lawn MI 48063  
 BOB MEUSER, 4200 Gregory St., Oakland CA 94619  
 WILLIAM C. YOUNG, 2516 Oakwood Dr., Bakersfield CA 93304  
 CHARLES WEISE, 33242 Tall Oaks Ct., Farmington MI 48024

Honorary Members

NEREO BEGGIATO, Roma 950, Ateneo Popular de Versailles, Buenos Aires, Argentina

New Year's Greetings

John Clemens, AMA President, recently sent out large hand-drawn New Year greeting cards. We received one with the request that it be passed on to NIMAS; so, best wishes to all of you from John Clemens!

Change of Address

Jerry Skrjanc, owner of Micro-X, requests that the new firm address be made known: Micro-X, P. O. Box 1063, Lorain OH 44055.

Renewal Reminder

Fully 40% of the January renewals are already in, and thanks to all of you! It is a tremendous help for members to note the date code ("02" and "03" for February and March respectively) and send in their renewal ahead of time. This date code appears in the upper left-hand corner of the label field on all addressograph printings.

Recent Publications

Model Airplane News has done it again - this time the subject is Junior C/P Jackpot - the model design flown by Bruce and Barry Paillet to several places in Junior Paper Stick and Cabin at the '71 and '72 Nats. It is a simple, rugged, good-flying design especially suitable for Junior competition. The use of different fuselage design with identical wing and tail surfaces minimizes the number of jigs needed to build two model classes. Thanks again to MAN for presenting indoor subjects when other U.S. publishers are cutting back!

Last month's comments about MAN being the only magazine which cares drew fire from Laurie Barr. He supported Aeromodeller, and rightly so. This magazine has given international indoor a good support for years - sorry for the unintentional slur!

NIMAS Awards

Silver Cat. I Rubber Award - 11:00, Dan Domina

Follow-Up!

Only one person expressed opinions regarding the content of NIMAS (What Do You Want?, Dec. '72 INAV), so in the absence of more opinions things must be OK!

Also, insufficient interest was shown so far to make it worthwhile to make up more of the out-of-stock NIMAS Charts displayed in the Dec. '72 issue. Several of the RFM Calculator charts are available for 70% each.

CONTEST CALENDAR

**CALIFORNIA** - Santa Ana  
 The next Santa Ana Record Trials will be held on Feb. 18, 1973. Contact Bob Randolph, 25145 Lawton Ave., Loma Linda CA 92354.

**CONNECTICUT** - Glastonbury  
 Indoor sessions at Glastonbury High School, 8 am to 12 Noon, Feb. 11, Mar. 18, Apr. 8, May 20 and June 17, 1973. Contact George Armstead, Jr., 89 Harvest Lane, Glastonbury CT 05073, ph. 203-633-7836.

**FLORIDA** - Miami

Indoor contests at the Youth Fair Exhibit Bldg., at SW 107 Ave. and Coral Way, Miami, on Feb. 11, Mar 18, Apr. 15 and May 20, 1973. Contact Dr. John Martin, 3327 Darwin St., Miami, FL 33133 for details.

**ILLINOIS** - Chicago

Indoor contests Feb. 11, Mar. 4, Mar. 25, Apr. 28-29, and Record Trials in May 1973. Various combinations of events at both Cat. I and Cat. II sites. Contact Pete Sotich, 3851 West 62nd Pl., Chicago IL 60629 for details.

**MASSACHUSETTS** - Amherst

Indoor sessions at Univ. of Mass. in Amherst on Jan. 28, Feb. 25, Mar. 4, Apr. 22 and May 13, 1973. Contact Charles Learoyd, 100 Mill Valley Rd., Hadley MA 01035.

**MASSACHUSETTS** - M.I.T.

Indoor sessions at M.I.T. Armory, Vassar St. & Mass. Ave., Cambridge MA. Sessions on Feb. 17 and Mar. 17, and a contest on Apr. 14, 1973. Sessions 3 pm to 6 pm; contest 10 am to 6 pm. Contact Ray Harlan, 15 Happy Hollow Rd., Wayland MA 01778, ph. 358-4013.

**MISSOURI** - Kansas City Area

Indoor contest Feb. 18, 1973 at Richard Gebour AFB, Mo. (Grandview, Mo.), 8 am to 5 pm. AMA Cub, HLG, Indoor Scale, PennyPlane, Indoor Stick. Contact Roger Schroeder, 4111 W. 98th St., Shawnee Mission KS 66207.

**NEW JERSEY** - Union

Indoor sessions Feb. 8 and Mar. 8, 1973 at Livingston School, Union, NJ, 7 pm to 10 pm. Contact Dan Domina, 1229 S. Long Ave., Hillside NJ 07208.

**NEW YORK** - Locust Valley

LIAMAC Cat. I Record Trials on Mar. 31, 1973, Friends Academy, Locust Valley, New York. Write J. G. Paillet, 30 Emerson Rd., Brookville, Glen Head, NY 11545 for more details and a map.

**OREGON** - Albany

Indoor contest Feb. 11, 1973 at South Albany High School, 3705 S. Columbus St., Albany. Contact Bob Stallick, 1120 Shady Lane, Albany OR 97321, ph. 928-8101.

FAI INDOOR REPORTTeam Selection Chairman Appointed

Bob Champine, P.O.Box 6213, Newport News VA 23606, has been appointed as Chairman of the 1973 Indoor Team Selection Program. For details of the Program, send a stamped, self-addressed envelope to AMA HQ with your request for info.

Program Status Report

The FAI Indoor Program has been announced in the Jan. '73 Competition News, with essentially the same format as was used to pick the 1972 Team. The matter of central vs. regional flyoffs is not yet decided, with several central sites under investigation before the unpopular two-site regional Finals becomes mandatory upon failure to qualify a central site. It may be remembered that this choice was forced by inept wording (or especially clever wording, depending upon your viewpoint) of the poll questions which defined this program.

Meanwhile, the CN commentary (aside from program details) contains misleading statements and outright distortions. Contrary to the leadoff statement "A deadlock concerning finals arrangements - -", this particular member of the Committee knows of no deadlock. Further, it was stated that the Committee's alternate recommendation involved alternation between East and West Coast sites. Rather, the recommendation was that a rotating site location similar to previous Nats practice be adopted, with a long-range planning committee involved.

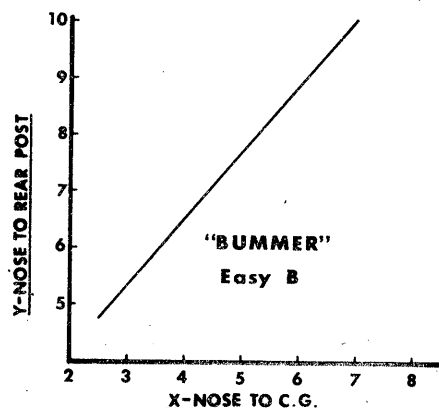
In another article "1973 Off To A Slow Start?", CN intimated that the general delay in the FAI Programs is due to careful study to avoid past mistakes blamed on hasty decisions. However, the Indoor section of the program has been troubled for 16 months; requests for early action got the reply "The Indoor Program is not the only thing that is important!" If the whole story becomes known, it will

be found that priority for our problems is so low that time runs out and only hasty decisions are made - too little and too late.

Only the latest of these unfortunate delays was the appointment of Erv Rodemsky two full months after he volunteered; if he had been accepted the day he offered, the appointment would have been months too late to do a proper job. The most flagrant lack of consideration for FAI Team Selection problems lies in the utter failure of the Executive Council to define official policy. 16 months ago, numerous FAI fliers petitioned their respective District VP's for redress, along the lines outlined in the Sept. '71 INAV. The result was a ten-minute discussion in the Feb. '72 Council meeting, which was then short-circuited by HQ announcement of a Document Which Answers All Problems. Unfortunately (and conveniently) the Document was not then available; it was subsequently published without Council scrutiny or approval. That the Document utterly failed except as a history report is obvious to all who read it; the only question is "When will something be done?" As a result of the lack of definite, defined policy, hasty, last-minute decisions regarding the Indoor program were made and became binding on all FAI Programs. Thus the cancer spreads through all the FAI Programs.

#### STATE OF THE ART

Larry Renger's "Bummer" is an outgrowth of his "Easy Breeze" which, as a microfilm-covered Easy B, held the Cat. I Senior Stick record for many years - until the B Stick class was combined with other Stick classes. The usual CMOS chart (below) is computed for 0% margin.



#### TOP TEN CEILING DODGERS

1. Stan Chilton	1115	35'	1.0	1115
2. Tom Vallee	810	20'	1.323	1071.6
3. Hal Crane	682	20'	1.323	902.3
4. Dick Hardcastle	602	23'	1.234	742.9
5. Hewitt Phillips	528.2	20'	1.323	698.8
6. Howard Haupt	456	22'	1.261	574.5
7. Harry Cook	471	26'	1.16	546.4
8. Bill Langley	421	27.5'	1.128	474.8
9. Jim Davidson	280	13'	1.64	459.2
10. Kevin Wehner	308.8	18'	1.394	430.4

#### RECORDS? MAYBE!

LIAMAC Indoor Record Trials, Dec. 30, 1972 Cat. I  
 Friends Academy, Locust Valley, New York  
 Jr. Indoor Cabin - 2:08.4, Richard Whitten\*  
 Jr. Indoor Cabin - 3:34.4, Barry Paillet\*\*  
 Jr. Autogyro - 0:02.6, Richard Whitten  
 \*Flight made at 1:15 pm; \*\*flight made at 2:50 pm

LANGLEY BRAINBUSTERS Record Trials, Dec. 30, 1972 Cat. I  
 Sr. R.O.G. Stick - 3:59.4, Phil Hainer

#### HINTS AND KINKS

##### Bill Landrum Suggests:

A spark plug gapping tool makes an excellent gage to set up the straightedge location while stripping spars and ribs. The "L" shaped variety has wires ranging from .023" to .042"; for tapered spars select two gages which match the desired dimensions and visually "measure" how far the straightedge is from the edge of the wood at each end.

Meanwhile, if your straightedge tends to slip while you make the cuts, Bill suggests that a strip of #400 wet-or-dry sandpaper glued to the bottom of the straightedge will hold it nicely in place with minimum pressure.

#### POSSIBLE WORLD RECORD!

The Dec. 30, 1972 record trials held at Willis School in Hampton, Va. had an almost world record by Hal Crane, followed by Bob Platt's series of flights culminating in a flight of 22:10. The model had an 8" x 33" wing, weighed .042 oz. and used .05 oz. of rubber .041" x .076".

#### DESIGN FOOTNOTES

##### Constant Margin of Stability

Since CMOS was introduced in the Jan. '69 INAV, most stick model 3-views in INAV have been accompanied by CMOS balance charts. Various questions about the method led to the development of an info packet on CMOS which was available upon request. This presentation is further explanation on how to use CMOS to design better models.

CMOS stands for constant margin of stability. The margin of stability of an airplane is a measure of how the model's stability differs from neutral stability. (A model with neutral stability has no tendency to recover from upset or ~~un-natural~~ un-natural attitudes.) With positive stability, the model tends to recover from upset, while with negative stability the upset will tend to get worse. By choosing an optimum margin of stability, it is possible to have a new model almost perfectly trimmed before it leaves the workbench. Certainly, it should never be necessary to move wing sockets or add ballast as sometimes happens with new models that must be flown that certain day!

In other words, models of similar design which have the same stability margin will fly almost the same, and after anyone "zeros in" on their favorite margin, they can build other designs with a minimum of adjustment problems to cope with.

The NIMAS CMOS Chart was designed by Hank Cole and was originally published in the Dec. '47 Air Trails. It was designed for A-2 gliders instead of indoor models, so it gives relative stability figures which are smaller than the absolute stability of the indoor model. Even though this difference may amount to perhaps 20% margin, the CMOS method allows direct comparison and can be used as if the results were correct.

Many people tend to shy away from CMOS because of the computations involved. However, if the balance diagram is furnished (as with INAV 3-views), it is simple to balance the model using CMOS. Assemble the model with prop and rubber motor on the complete fuselage/tail group and find the balance point as usual. Measure from the balance point to the thrust bearing - let's assume the distance is 8". If Fig. 1 is the balance chart for the model and we wish to use 0% margin, follow the dotted line up from 8" to the 0% line and across to the Y axis at 8.55". Thus, the rear post should be located 8.55" from the thrust bearing. If the stab tilt and wing washin/washout is OK, only incidence and thrust line should need to be set for a good flying model!

Calculation of CMOS balance diagrams is simpler than most people realize. Fig. 2 is the top of the CMOS computation form, listing wing and tail specifications. Beginning with span and area, the average chord (span/area) and aspect ratio (span/sv. chord) are computed. Fig. 3 is the CMOS Chart (extrapolated to wing aspect ratio = 3). With a wing aspect ratio = 6.25:1 and stab aspect ratio = 4.3:1 both lines have to be interpolated; the intersection on the Chart is at .46 (C<sub>r</sub>).

Tail moment arm is usually defined as the distance between 25% of average chord on the wing to the same point on the stab. As a beginning example, let's assume a wing and stab that are rectangular; the root chord will equal the average chord. Thus for the model with dimensions as defined in Fig. 2, 25% of wing and stab chords are 1" and .7" respectively. Since the wing and stab do not taper in any fashion, 0" is noted as the dimension between average chord and trailing or leading edges. With a tail boom 12" long, subtract 2.1" from 12" to reach the rear hook, then add the distance "2" and 3" to define the tail moment arm.

The CMOS method is a graphical solution which eliminates several computations by defining a straight line. To do this, the aerodynamic center is calculated for two wing locations; in this example the wing will be 1" from the rear hook (Z = 1") and 6" from the rear hook. The formula for A.C. is shown solved for these two wing locations and values for X (distance from balance point to nose) and Y (distance from rear post to balance point) are plotted on Fig. 1, working from values in the box on Fig. 2.

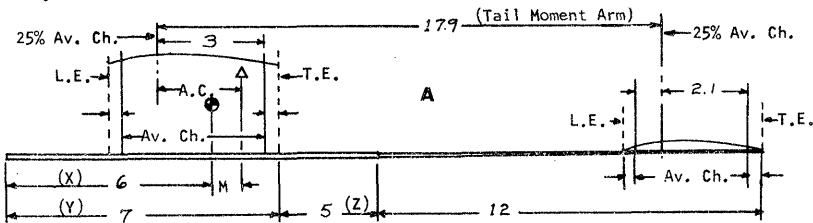
The computations discussed above were also made with the stipulation of 0% margin - the aerodynamic center and center of gravity are coincident. This simplifies the computation considerably. Note that Fig. 1 has three balance lines - +5%, 0% and -5%. Only the 0% line was calculated in Fig. 2, and the other two lines were established

by moving the 0% line .05 x 4 (4" avg. chord) in each direction. Three dotted lines on Fig. 1 show the effect on wing location that different choices of stability margin will have; rear wing post locations are 8.8", 8.55" and 8.3" from the nose as the margin changes from +5% to -5%.

The final factor to consider in CMOS computation is average chord. If the model in question had used a wing with parabolic planform, 25" span and 5.1" root chord, the area would still be 100 sq. in. and average chord would be 4" - same as before. The only change in computation would be that the wing is 1.1" wider at the root, half in front and half in back. The 0" dimension at the T.E. would then become .55", tail moment arm figures would change to 14.45 and 19.45. The slope of the graph and location of the 0% line will not change.

The location of the end-points of the average chord is obvious on wings symmetrical with respect to the lateral centerline. A shortcut for locating mean chord of wings with odd shapes is shown in Fig. 4. With a span of 25.4", root chord of 6" and area of 127 sq.in., average chord is 5". A scale drawing of the wing planform was used, and the T.E. dimension checked to be .25".

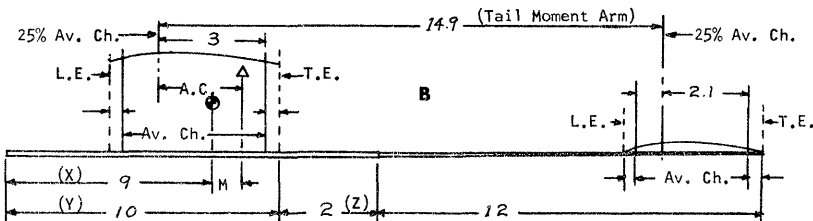
To figure stability margin on an existing model, compute the A.C. as before, then measure where the CG is with respect to the CG. Compute the margin according to the formula shown in Fig. 2. Fig. 5 illustrates this process on two models built to the design illustrated in Fig. 2, except that both models were built with fixed 70% CG. Model A balanced 6" from the nose and model B balanced 9" from the nose. The margin computation shows dramatically how much variation is possible between models of the same design which vary in balance point - the wing posts of model A might have to be moved as much as 1/2" to make it fly as well as model B!



$$A.C. = \frac{32.8}{100} \times 17.9 \times .46 = 2.7 \quad 3 - 2.7 = .3; \Delta \leftarrow T.E.$$

$$1 - .3 = .7; CG \leftarrow A.C.$$

$$\text{Stability Margin} = \frac{.7}{4} \times 100 = 17.5\%$$

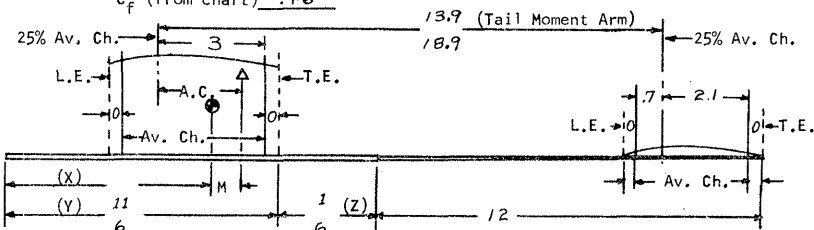


$$A.C. = \frac{32.8}{100} \times 14.9 \times .46 = 2.25 \quad 3 - 2.25 = .75; \Delta \leftarrow T.E.$$

$$1 - .75 = .25; CG \leftarrow A.C.$$

$$\text{Stability Margin} = \frac{.25}{4} \times 100 = 6.25\%$$

MODEL SPECS: Wing Span 25 Wing Area 100 Av. Chord 4 Aspect Ratio 6.25:1  
 Stab span 12 Stab area 32.8 Av. chord 2.8 Aspect ratio 4.3:1  
 $C_f$  (from chart) .46



$$\text{Tail Moment Arm} = 12 - 2.1 + Z + 3$$

$$A.C. = \frac{\text{Stab Area}}{\text{Wing Area}} \times \text{Tail Moment Arm} \times C_f \quad \text{Stability Margin} = \frac{M}{\text{Av. Chord}} \times 100\%$$

$$= \frac{32.8}{100} \times 13.9 \times .46 = 2.1 \quad (Z = 1) \quad 3 - 2.1 = .9; A.C. \leftarrow T.E.$$

$$11 - .9 = X = 10.1$$

$$\begin{matrix} Z = 1 \\ Y = 11 \\ X = 10.1 \end{matrix}$$

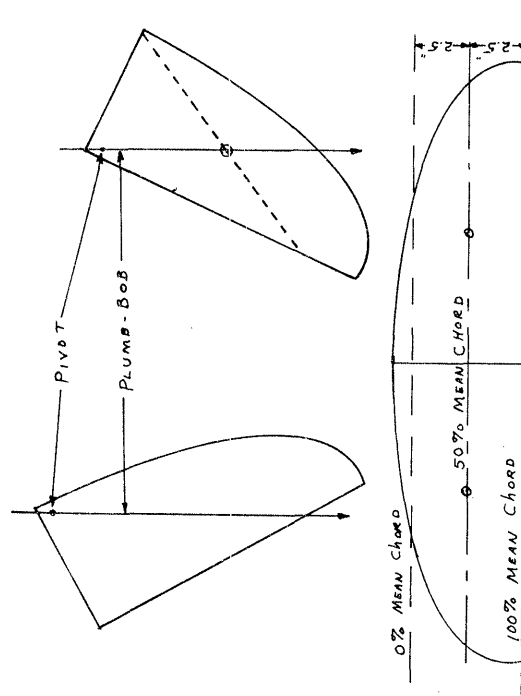
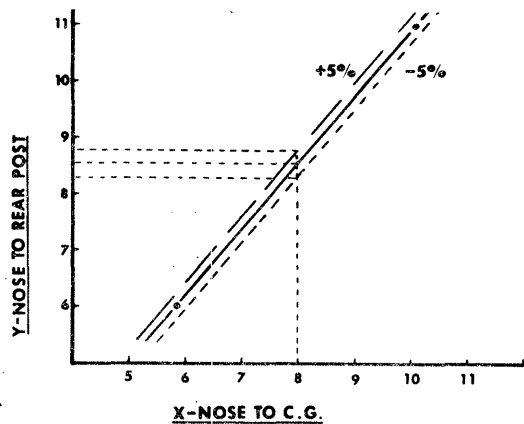
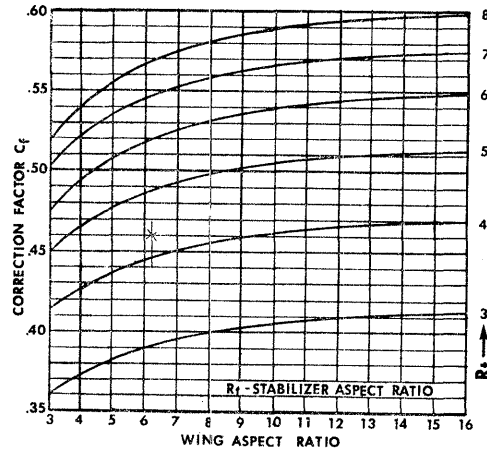
$$= \frac{32.8}{100} \times 18.9 \times .46 = 2.85 \quad (Z = 6) \quad 3 - 2.85 = .15; A.C. \leftarrow T.E.$$

$$6 - .15 = X = 5.85$$

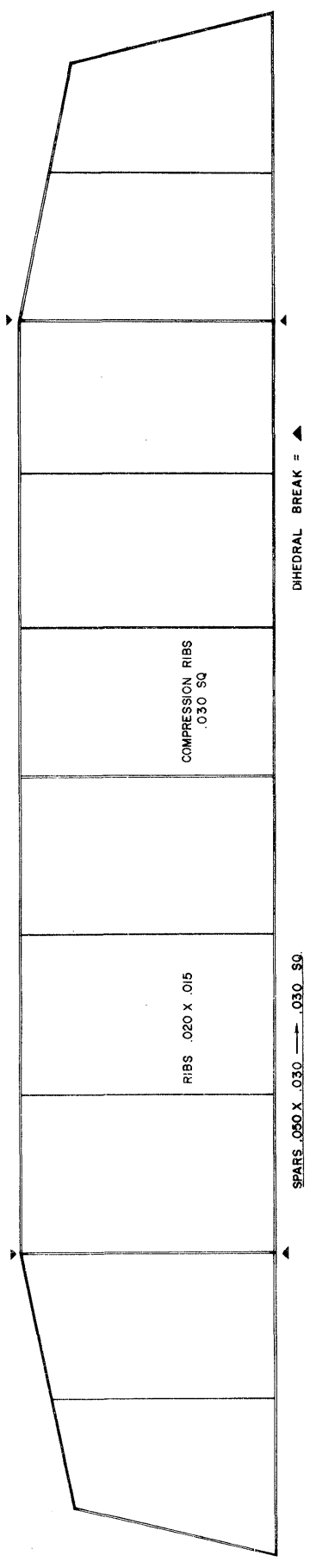
$$\begin{matrix} Z = 6 \\ Y = 6 \\ X = 5.85 \end{matrix}$$

Besides the benefits of more efficient flying and ready-made flight trim, models balanced near 0% margin by this system and adjusted with washin/washout wing trim are usually excellent rafter-banging models. Also, and this is not yet proven, CMOS balanced models seem less affected by light drift than models with high positive margin such as model A of Fig. 5.

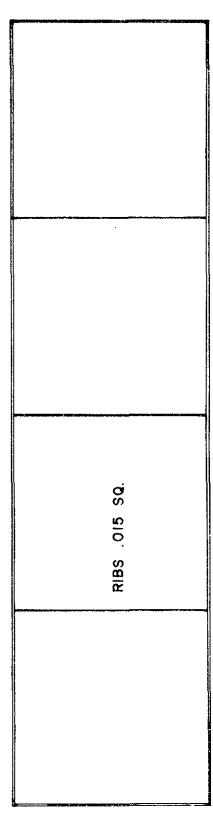
Three final points regarding CMOS: First,  $C_f$  remains unchanged so long as wing and stab dimensions and tail boom length remain unchanged. Changes in motor stick length can be handled by making a corresponding change in both X and Y dimensions. It is easiest to use projected wing area and build the wing to fit max span limits on FAI and PennyPlane models.



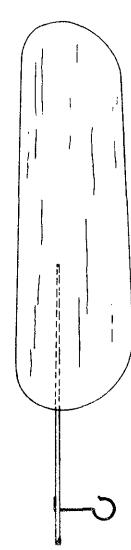
1/73



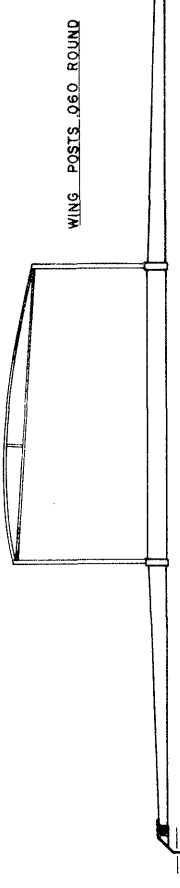
COMPRESSION RIBS AT CENTER AND DIHEDRAL BREAKS ONLY.



SPARS .030 X .020

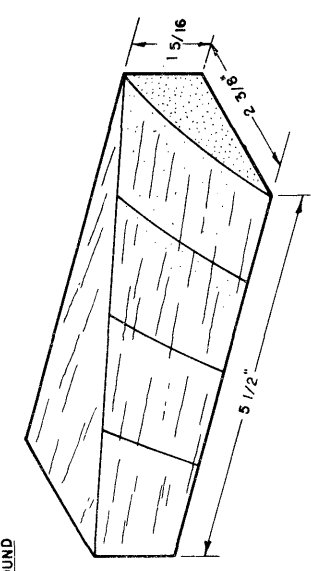


PROP 10" DIAM. 20° PITCH. NO FLARE  
BLADES .012 → .008 SHEET  
SPAR .060 → .015 ROUND

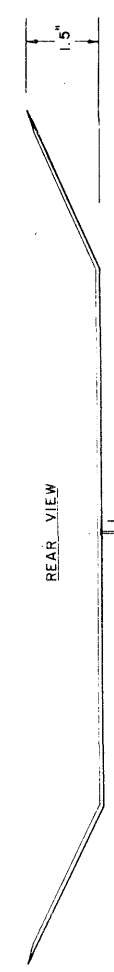


RUDDER .015 SQ.

BOOM .040 → .020 ROUND



PROP BLOCK - HELICAL PITCH WITH AIRFOIL WARP ON BLOCK, THEN USE AS JIG FOR FINAL ASSEMBLY.



REAR VIEW

# "BUMMER"

CONDENSER PAPER EASY-B NO BRACING  
SOLID STICK RULES  
DESIGNED BY LARRY RENGER 10-24-70



# INDOOR

## NEWS and VIEWS

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

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

### New Members!

DAVE BEASLEY, 6601 Nestle, Reseda, CA 91335  
R. H. FORST, Rt. #1, Box 59B, Minooka IL 60447

### Change Of Address

BILLY H. PETTIT, 1795 Medallion Ct., Mississauga, Ontario  
Canada

### NIMAS Awards

Silver Cat. I Rubber Award - 10:36.5, Bill Langley

Silver Cat. I Rubber Award - 10:06.5, Dick Starks

### Youth Recognition Lacking?

It was recently pointed out that even though Juniors and Seniors turn in exceptional performances with indoor models at the Nats, in FAI trials and in the record columns, it is seldom that they receive recognition for their fine efforts.

Is it possible that NIMAS can and should remedy this oversight with some sort of honorary award? If this idea strikes your fancy as it did mine, please drop a line to give ideas about how such a program should be set up.

### Renewal Reminder

55% of the February renewals have already come in, and this is a welcome and helpful situation. Incidentally, it was mentioned that these renewal notices have failed to give the amount for renewal - sorry about that! NIMAS membership (including INAV) is \$3.25/year, while INAV subscription only is \$2.25/year. When to renew? All those whose address was printed by the addresser printer instead being a paper label will find a number (like 03) in the upper left corner of the address block. "03" stands for March, and that sub expires in March!

### New Glider Mark!

In his series "The Hand Launch Glider", Richard Miller says (Feb. '62 INAV) "The next ten seconds, the 1:20 to 1:30 range, are not going to be easy to come by. To those who have thrown in the vicinity of 1:15 the problems are evident; to those who haven't spent a minute-and-a-half looking at your stop watch, this will convince you that a glider has to go mighty high and come down mighty slow to hit 1:30." Further on, Richard says "I wouldn't go so far as to say that the medium aspect ratio glider (5:1 to 7:1) has gone as far as it can go but I do feel that the high aspect ratio machine, once its aerodynamic peculiarities are mastered, is the most likely contender for the 1:30 mark and that its very special advantages should make it especially potent in low and medium ceiling flying."

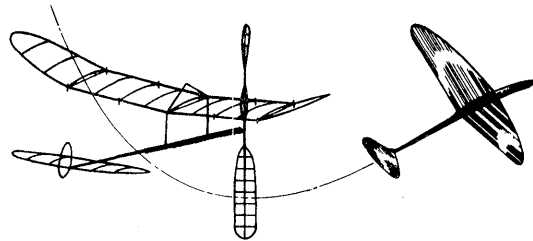
It took eleven years from Miller's prediction, but the 1:30 IHLG mark has been achieved by Ron Wittman at the Feb. 18, 1973 record trials at Santa Ana. Ron's "new generation" glider, Super Sweep 22, set a new IHLG record of 1:30 + 1:28.7 = 2:58.7. These gliders represent a truly evolutionary approach, and the result is a solidly consistent machine. All three of Ron's SS-22's have averaged over 1:20, and he has logged over 50 consecutive flights over 1:20. Ron is to be congratulated for his solid contribution to the state of the HLG art!

### '73 Nats

The 1973 Nats will be held Aug. 6-12, at Oshkosh, Wisconsin. No site has been chosen for Indoor at this time, according to the AMA news release, but it is expected that a suitable site will be located within 100 miles of the Oshkosh site.

### For Lack Of A Blade

Bob Cowley mourns the passing of the last of his supply of Gillette Blue Blades. Has anyone an idea where good steel (not stainless) double-edge blades can be purchased? If you have access to a supply, how about revealing the source?



### Cops!

In the wee hours before the last issue went to press, figure numbers were omitted from the CMOS discussion. So, on p. 4 of the Jan. '73 INAV, in column 1 the illustrations are (moving down) 5A, 5B, 2. In column 2: 3, 1, 4.

### Recent Publications

"The Fascinating World of Indoor Models - A Visit With Bill Bigge" is featured in the March '73 AAM. This piece by Tom Vallee gives many details of Bill's very successful model dirigible, and includes photos of several of Bill's other indoor model sidelines. A good effort!

The Jan. '73 issue of Aeromodeller contains an excellent article by Laurie Barr; an analysis of and report on Pete Andrew's World Championship FAI model. Pete gave the model to Laurie in a gesture of thanks for Laurie's large part in the excellent preparations for the WCh, and this afforded Laurie an excellent chance to analyze the model.

"Chicago Aeronuts", by Sid Miller, reports on the more recent activities of one of the best-known model clubs in Indoor history. Although the Aeronuts fly all free flight events, much of the U. S. state of the art can be traced from developments and achievements of Aeronuts in the past 35 years of the club's activity. In addition, the story is almost a blueprint of how the Aeronuts solved the problem of lack of indoor sites. This interesting article appears in the Mar. '73 Model Airplane News.

Finally, a tribute to a long-time NIMAS member - Dave Linstrum. His column, "VTO", in MAN, remains an excellent continuing report on indoor and outdoor FF. In the April '73 VTO, Dave departs his normal orbit enough to make a very entertaining review of "Jonathan Livingston Seagull", a rising best-seller about a very unusual bird. Don't miss it (the book or the review!)

### FAI INDOOR REPORT

#### Executive Council Action

The February meeting of the AMA Executive Council set up a committee of three AMA VP's; Stan Chilton (Dist. VIII) is chairman of the committee and represents FF and Indoor interests. Glenn Lee (Dist. VI) represents C/L, and John Spalding (Dist. IV) represents R/C interests. The group has the responsibility of creating FAI program guidelines which are so sorely needed. Let's wish them well.

#### Team Selection Program

The exact wording of the 1973 Indoor Team Selection Program can be had from the Jan. '73 Competition News, or by sending a stamped, self-addressed envelope to AMA HQ with your request. In general, the program provisions are thus:

1. Open to all 1973 AMA members who have or purchase a FAI stamp; any Team Members chosen must be at least 14 years old by the start of the 1974 World Champs.
2. Enter by sending \$1 to AMA HQ, or by paying \$1 to CD of a Local Qual. Trials. HQ entry is recommended, as it is then possible to qualify at any sanctioned indoor contest.
3. Qualify by scoring 75% of the top time at a Local Trials, or by scoring 75% of the winning time of any indoor event for rubber powered models which weigh at least one gram and have a maximum wing span no greater than 65 cm. (PennyPlane, Easy B if model weighs 1 g, and other indoor events meeting span and weight rules)
4. Exceptions: Program entrants more than 200 miles from either AMA contests or Local Trials may by-pass the Local Qualification; also any winner through fifth place in Stick, Cabin or Paper Stick at the '72 Nats may enter directly at the Semi-Final level.
5. Semi-Finals Trials - entrants must score 80% of the winning time or be in the upper 2/3 of the placing to advance to the Finals.
6. Finals - Top three winners at the Finals will represent the U. S. at the 1974 Indoor World Championship.
7. Fees: Besides the \$1 registration fee, Local entry fee is \$5 (\$2 for Juniors). Semi-Final fee is \$8 (\$2 for Juniors), and Finals fee is \$10 for all entrants. For those who by-pass Locals, entry fee is \$18 (\$6 for

8. Juniors). The extra fee represents money which would have been spent on travel, etc. in the Local Trials. Schedules: Local Trials must be completed by May 27, 1973; registered participants may fly in as many Local Trials as desired until qualification is accomplished; only one Local entry fee need be paid.

#### Finals Site Located

Word has been received from Erv Rodemsky that American Airlines' 747 hangar in Tulsa, Oklahoma has been cleared by AA for use as the 1973 Team Selection Finals site. The hangar will "swallow" a 747 whole, with room to spare and has no internal supports.

#### NIMAS POSTAL MEET

The 8th Annual NIMAS Postal meet will be open for entry through April 16, 1973. All flights made as part of a sanctioned indoor meet from Jan. 1 through April 16 are eligible, as are flights made in informal sessions between now and Apr. 16, provided these sessions are run in accord with AMA rules.

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' 1" to 35'.

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

PennyPlane - Chicago Aeronauts rules except that ceiling contact permitted and FAI ceiling measure.

Ceiling Dodger - Any class indoor model, flown by AMA Rules except flight must not touch ceiling or obstructions for time to count. In response to a query, this interpretation was made regarding contacts: Models landing on obstructions during the descent phase of flight (chairs, stage, balcony, helicopters, etc.) are not disqualified. The intent of the event is to encourage model development; the principle governing a decision is that obstacle contact must not limit the model's climb in any fashion. For example, a model which drifts into a wall during the descent, then slides to the floor would not be disqualified.

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 on one day. Please note ceiling height for each entry, as this will be used to compute fudge factors (see below) to equalize ceiling heights. Separate classes for Juniors in each event, with awards for high placing Seniors. Separate class for sub-junior (age 12 and under) in HLG. Anyone may enter, send entries to Box 545, Richardson TX 75080.

#### Postal Fudge Factors

The following fudge factors will be used for the NIMAS Postal; multiply the flight time by the appropriate factor to obtain postal scores.

Ceiling (feet)	Class I HLG (Fudge to 25')	Class II HLG (Fudge to 35')	Rubber (Fudge to 35')
18	1.39		1.394
19	1.316		1.357
20	1.25		1.323
21	1.19		1.29
22	1.136		1.261
23	1.087		1.234
24	1.042		1.207
25	1.0	1.4	1.183
26		1.346	1.16
27		1.296	1.139
28		1.25	1.118
29		1.207	1.098
30		1.167	1.08
31		1.129	1.063
32		1.094	1.046
33		1.061	1.03
34		1.029	1.014
35		1.0	1.0

#### STATE OF THE ART

Two of the top models from the 1973 Indoor WCh are featured this month - Pete Andrews' winner and Sal Cannizzo's fourth place ship. In truth, any of the top several models might have changed places, and both of these models have excellent performance and points to recommend them for others to build.

Pete's "FAI '72", rated by Pete at .037 oz (it seemed even heavier as he weighed in on the precision balances of the SMAE) and not even close to the maximum span (nearly two cm short of allowable span), was clearly designed and constructed by a master. The subtle sophistication of the design and Pete's intimate knowledge of its performance

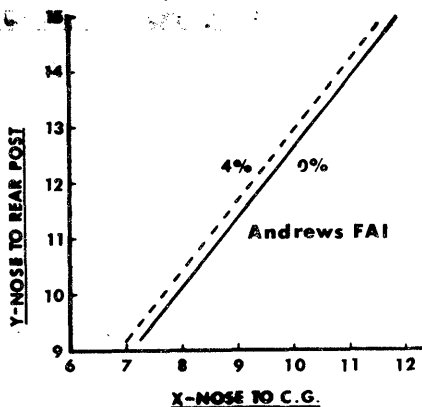
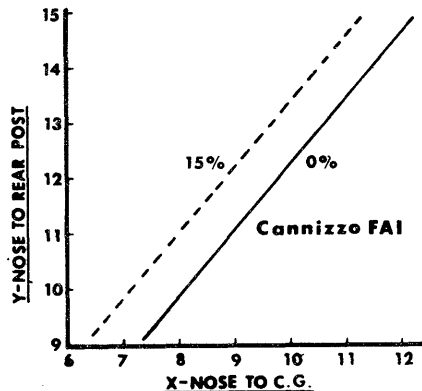
gave him an edge that wasn't overcome by some mighty sharp fliers. Besides the information on the drawing, the following comments apply:

- Wing - 26" x 8" parabolic development, divided 3 1/5" with 25" projected span. Wing posts each 3" long and offset 1" from wing center. Cabane equal angle, 2.5" above spars. Bracing .001" nichrome. CG 5.6" behind leading edge. Airfoil (shown) 3% thick @ 40%.
- Stab - 18" x 5.4" parabolic development, symmetrical, airfoil 3% thick @ 40%, no bracing.
- Rudder - 3" x 4.5" ellipse.
- Motor Stick - 14.5" long, 5/16" dia., double bearing, 45° offset bracing, .001" tungsten.
- Tailboom - 12" long, 1/4" dia. tapered to 1/16" dia.
- Prop - 20" x 32", 2.25" max width, 1/4" flare.
- Motor - 19" loop .055" x .042" pirelli, 1950 turns, 36:12.

Special note - The compression ribs were specially constructed to have double thickness in the center and normal thickness at the ends; two templates are needed to cut these ribs:

Sal Cannizzo must be rated as a relative beginner to indoor flying, but also he is an old hand at both rubber powered models and international competition after having been on two U. S. Wakefield teams. "SC-3" is a simple but thoroughly sound design with a clean power pattern rivaling that of "FAI '72". Sal supplies the following extra information about his WCh models: "I used a 50% stab model on one of the 34+ flights, but the design is otherwise the same. The prop on the 50% model (pattern shown) was 18" x 33" with max width of 2 5/16", using .052" loop of rubber 18" long and 2100 turns. My other 34+ flight used a Bilgri prop ('72 NFFS Sympo report) increased to 20" dia."

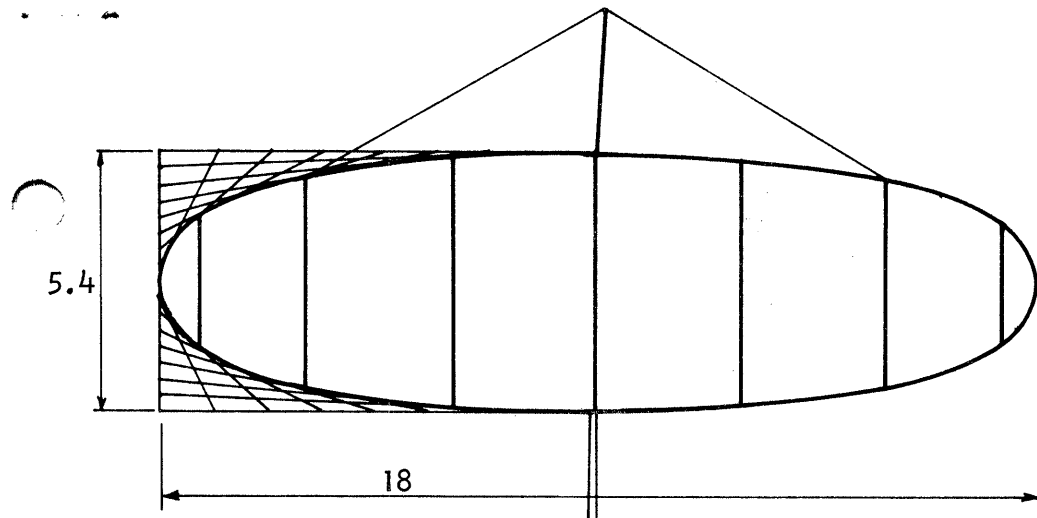
Presented below are the CMOS charts of these models; Andrews used approximately +4% margin, while Sal's trim checked out to +15% on the model shown.



#### CONTEST CALENDAR

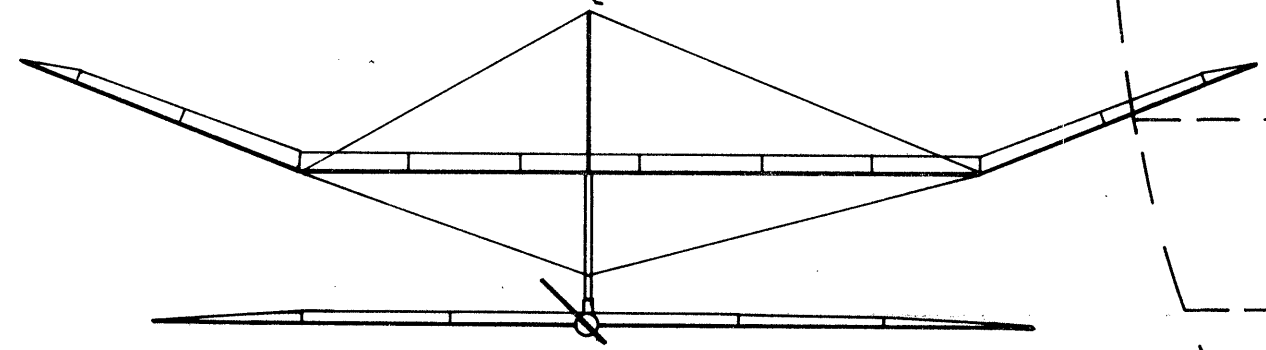
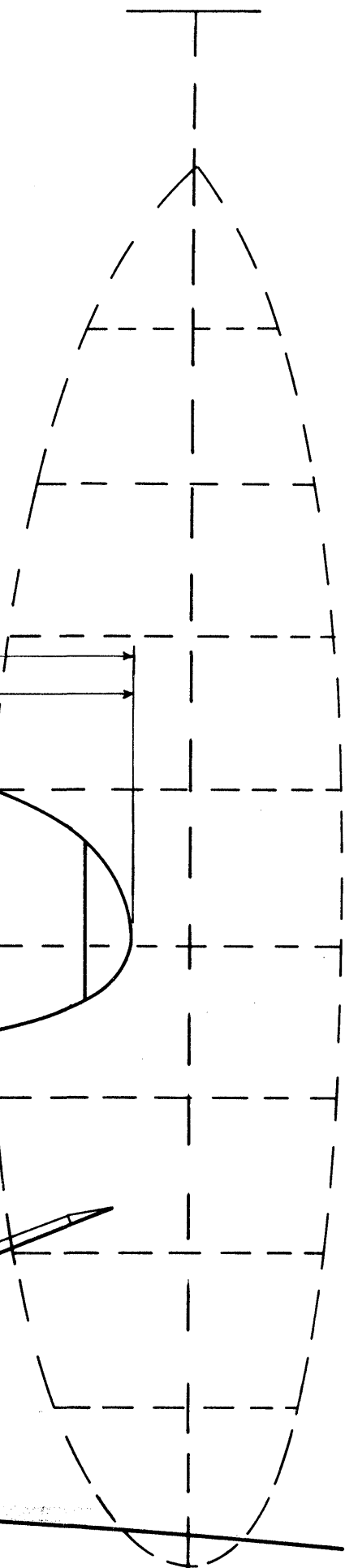
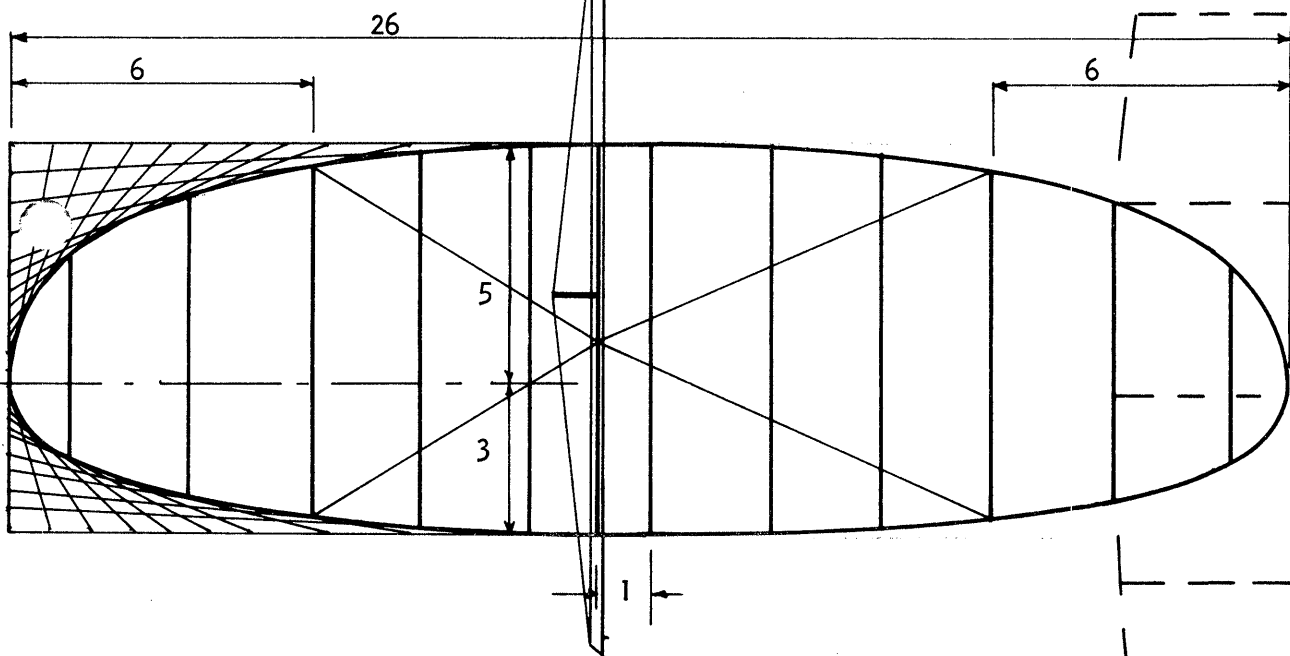
CALIFORNIA - Santa Ana  
Record Trials at Santa Ana MCAF, Mar. 17-18, 1973.  
Contact Bob Randolph, 25145 Lawton Ave., Loma Linda CA 92354 for more info.

CANADA - British Columbia  
Contests in the 90' Agrodome in Port Coquitlam will be held on Mar. 4, June 30, Oct. 6 and Nov. 17-18, 1983, with FAI Indoor, PennyPlane, HLG and Scale. Contact Alan Richee, 1568 Celeste Cres., Port Coquitlam, B.C., Canada for more details. (to P.5)



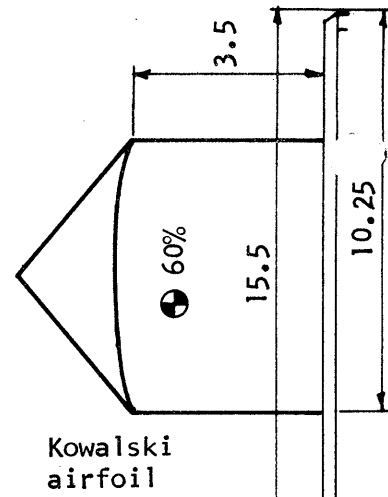
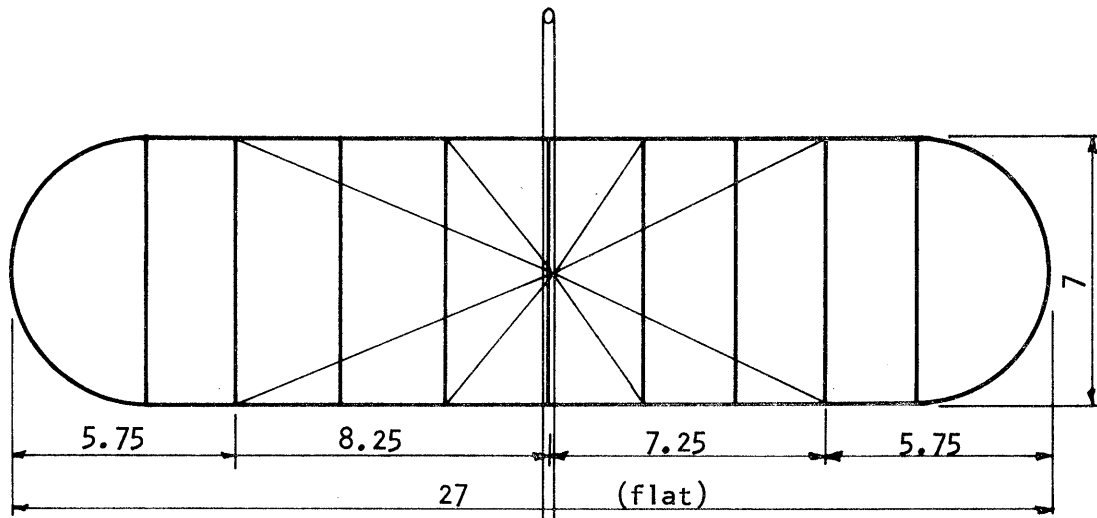
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 12  
 3  
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 29.5

**FAI '72**  
**Pete Andrews**



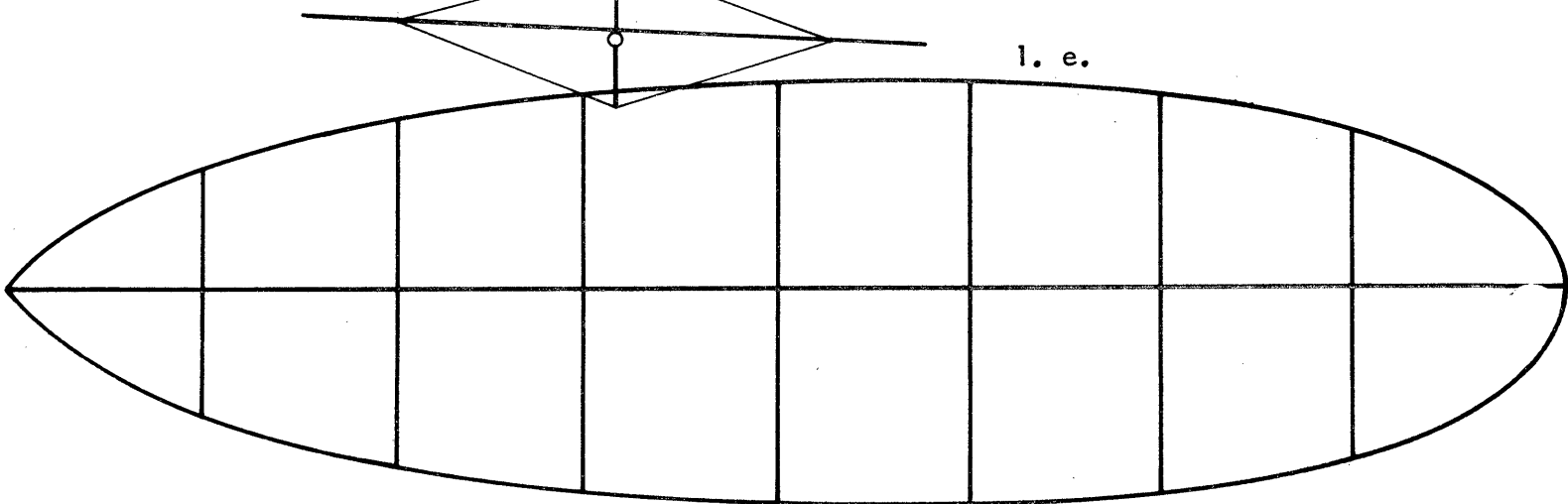
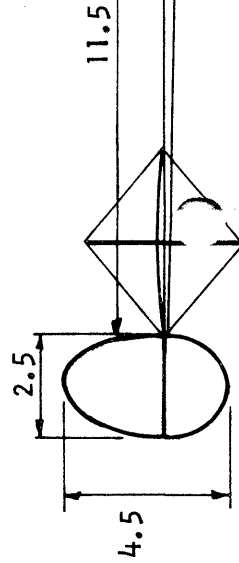
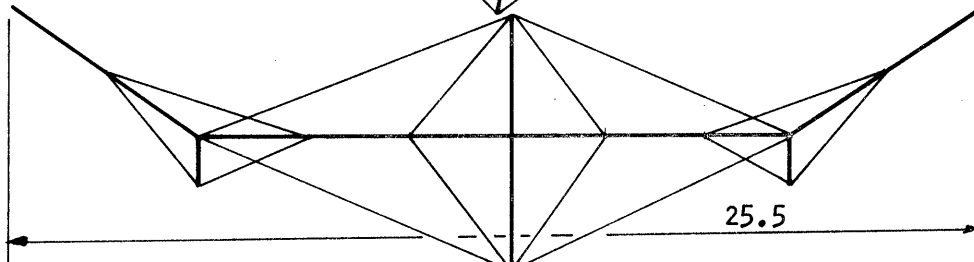
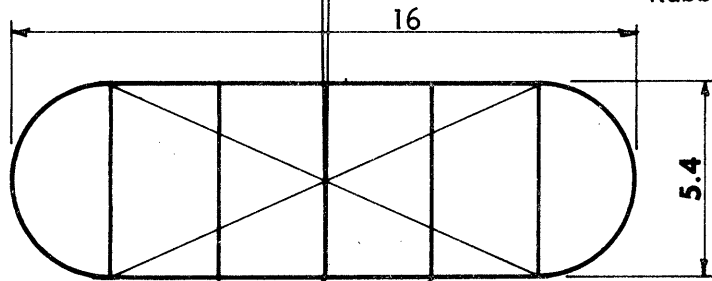
CENTER RIB - cut from rear





**FAI SC-3**  
**Sal Cannizzo**

Weights  
Stick + Tail .0195  
Wing .0095  
Prop .0065  
.0355  
Rubber - .053 x 18  
2050 turns



**CONNECTICUT - Glastonbury**

Indoor sessions at Glastonbury High School, 8 am to 12 noon, Mar. 18, Apr. 8, May 20 and June 17, 1973. Contact George Armstead, Jr., 89 Harvest Lane, Glastonbury CT 05073, ph. 203-633-7836.

**FLORIDA - Miami**

Indoor contests at the Youth Fair Exhibit Bldg., at SW 107 Ave. and Coral Way, Miami, on Mar. 18, Apr. 15 and May 20, 1973. Contact Dr. John Martin, 3327 Darwin St., Miami FL 33133 for details.

**ILLINOIS - Chicago**

Indoor contests Mar. 4, Mar. 25, Apr. 28-29, and Record Trials in May 1973. Various combinations of events at both Cat. I and Cat. II sites. Contact Pete Sotich, 3851 West 62nd Place, Chicago IL 60629, ph. 312-RE5-1353.

**MASSACHUSETTS - Amherst**

Indoor sessions at Univ. of Mass. in Amherst on Mar. 4, Apr. 22 and May 13, 1973. Contact Charles Learoyd, 100 Mill Valley Rd., Hadley MA 01035 for details.

**MASSACHUSETTS - M.I.T.**

Indoor sessions at MIT Armory, Vassar St. & Mass. Ave. Cambridge, Mass. Session on Mar. 17, and a contest on Apr. 14, 1973. Contact Ray Harlan, 15 Happy Hollow Rd., Wayland MA 01778, ph. 358-4013 for details.

**MISSOURI - St. Louis**

Indoor contests at East St. Louis Armory on Mar. 4, Apr. 8 and June 2, 1973. HLG, Easy B, Paper Stick, Indoor Stick, Scale, Peanut, Tern Aero and Delta Dart. Contact Jim Bennett, 324 Helfenstein, St. Louis MO 63119, ph. 314-962-5271 for details.

**NEW JERSEY - Lakehurst**

Sessions at Hangar #1 Apr. 1, Apr. 15, 1973. Contact C. V Russo, 143 Willow Way, Clark NJ 07066 for details.

**NEW JERSEY - Princeton**

Indoor contest at Jadwyn Gym, Princeton Univ., Princeton, N.J., 9 am to 5 pm, May 20, 1973. HLG, Paper Stick, Scale, Paper Glider. Contact John Kukon, 14 Brandon Rd., Trenton NJ 08638 for more info.

**NEW JERSEY - Union**

Indoor session Mar. 8, 1973 at Livingston School, Union, N.J., 7 pm to 10 pm. Possibility that FAI Local Qual. will be held Mar. 25, 1973. Contact Dan Domina, 1229 S. Long Ave., Hillside NJ 07208.

**NEW YORK - Locust Valley**

LIAMAC Cat. I Record Trials on Mar. 31, 1973, Friends Academy, Locust Valley, New York. Write J. G. Pallet, 30 Emerson Rd., Brookville, Glen Head NY 11545 for more details and a map.

**INTERNATIONAL CONTESTS**

Romania has announced an international indoor meet at Slanic (the salt mine, site of the '70 WCh), May 11-13, 1973. It is expected that three U. S. fliers, Bud Romak, Erv Rodemsky and Jim Richmond will attend as a team from the U. S.

**NEWS FROM AROUND THE WORLD**

**ITALY**

Recently, an announcement was received from the Aero Club of Rimini, Italy, which apparently indicated that Italy has adopted PennyPlane as an event, with essentially the same rules as used in the U. S. Due to slow postal delivery, the announcement was received in January, but the first Rimini contest was to be held last November. No word has been received of their results or what site was used.

**CALIFORNIA - San Jose**

Richard Douglas reports that the San Jose area has been having Cat. I contests featuring HLG, Paper Stick and Indoor Scale. In sites ranging from 21' to 26', times have ranged up to 54 sec. in HLG and 10½ min. in Paper.

**CALIFORNIA - Santa Ana**

Besides the almost monthly record trials, there have been lively HLG contests in the hangar. A recent Jr. HLG contest sponsored by the San Diego Orbiters had the following results:

- |                   |        |        |
|-------------------|--------|--------|
| 1. Tony Patchin   | age 11 | 1:34.5 |
| 2. Steve Wittman  | age 9  | 1:31.4 |
| 3. Geoff Peterson | age 13 | 1:29.4 |
| 4. John Magnus    | age 13 | 1:05.0 |
| 5. Chris Peterson | age 10 | 0:54.4 |

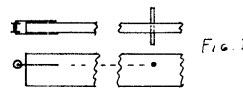
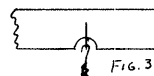
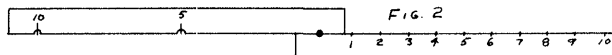
In addition, Bob Randolph has continued intensive efforts toward better performance. He has been flying models with anhedral stabs and no rudder; a "D" with 200 sq. in. wing recently did 40:07.

**BEAM BALANCE COMMENTS**

On page 65, Jan '73 AAM, I presented a simplified indoor beam balance construction piece. Bill Bigge offers the following comments for refinement:

I gather that the pan hangs from a wire hook which rests in a notch in the beam. This is an unnecessary source of error, even though it is insignificant in most cases. Fig. 1 shows a better pan support; note that the centerline of the pivot is at the same level as the center pivot (for the beam).

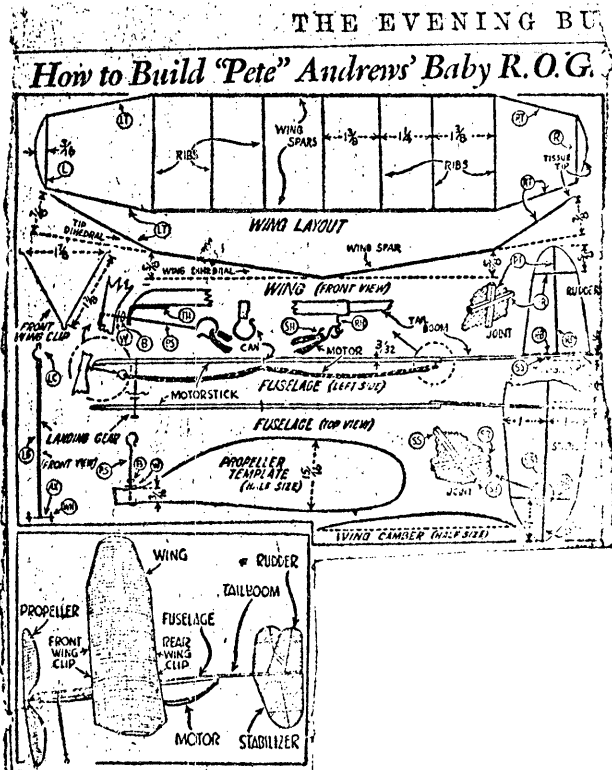
It is not apparent from the sketch whether the weights will swing freely from notches in the beam. If they do, the balance will be unstable with a large enough load unless the bottoms of all the notches are at the same level as the main pivot. In other words, both the movable weights and the pan should hang in the same plane as the beam pivot to avoid disturbing the beam sensitivity. Fig. 2 shows a beam arrangement which allows the pivot to be at the top of the right half of the beam and still permit vertical balance (sensitivity) to be set with very little extraneous weight. Check stations and the pan can use a wire "U" with a small notch for clearance (Fig. 3).



Probably something should be said about weighing by replacement, the so-called single-arm principle. It is convenient to use two arms, even two arms that are both variable as in the AAM sketch. This definitely should be used in constructing a set of weights, and regular use in critical weighing eliminates several sources of error.

**A LOOK AT YESTERYEAR**

In the early 1930's, Philadelphia was an indoor "hot bed" of activity. The activity was aided and encouraged by model airplane plans published in newspapers. Pete Andrews was active at that time, and below is a photostat of his ROG model which set a Senior record of 6:36. The plan appeared in 1932, in an issue of the Philadelphia Evening Bulletin.



# INDOOR

## NEWS and VIEWS

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

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

### New Members!

Dr. ROBERT J. GALLAGHER, 319 W. Main St., Monogahela PA 15063  
 ROGER A. KINGSINGER, 8317 August, Westland MI 48185  
 MALCOLM LAUBACH, 4021 Lafayette Pl., Culver City CA 90230  
 JOHN W. LEMON, JR., 16246 Edwards Ave., Southfield MI 48076

### Sponsored Junior Members

STEVE LOVINS, 619 NE 39th Terr., Kansas City MO 64116

Steve has been nominated by Bill Langley, one of the kingpins of the growing and healthy activity in Kansas City. However, Kevin Wehner, a "graduate" sponsored junior, got Steve interested in indoor during 1971, helping him build an Easy B. In the recent Winged Motors Indoor contest, Steve won Open Indoor Stick, AMA Cub, placed 2nd in Jr. HLG and got the Junior high time award. It is easy to have high expectations for Steve's future work!

### Rubber Stripper

For those who inquired about the rubber stripper mentioned in the Aeromodeller report of the '72 WCh (Jan. '72 issue), an improved version is reported to be available. For info, write Ryszard Czechowski, KRAKOW, str. Pradnicka 68a/60, Poland.

### Follow-up - Razor Blades

Bob Crowley's plight of no razor blades yielded the following responses:

Charles Learoyd suggests that Sears Roebuck "Craftsman" (Swedish Chrome Steel) double edge blades are very good. These are found in the tool section, and are sold for scrapers. Unlike most scraper blades, the sample he furnished worked very well in a razor plane.

Bill Shailor, 13596 Montrose, Detroit MI 48227, will send furnish blades from the source used by the Detroit Balsa Bugs - his cost is 3¢/blade plus postage. Please limit your order to 10 packages of 5/package, and send 16¢ postage for that quantity.

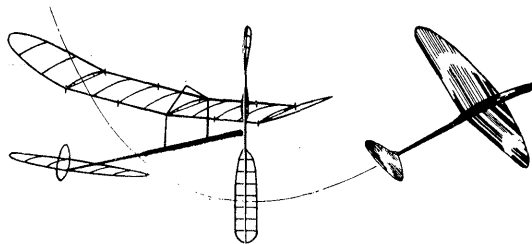
Ralph Dodsworth, 437 Ave. U South, Saskatoon, Sask., Canada, has ample supply of blades @ 45¢/package plus postage.

### Changing Your Address?

Periodically we receive letters or renewals from someone who has moved. Usually, the new address is called to our attention, but sometimes it is not. It used to be easy to spot changed addresses, since I typed labels for the mailing. Since the thoughtful gift of an addresser-printer, it is much more difficult to remember the current addresses of over 300 members and subscribers! Therefore, it is quite disconcerting to suddenly note an unfamiliar return address and realize the sender has moved without even trying to call the new address to our attention. It is very much appreciated whenever new addresses are highlighted in some fashion!

### This Issue

This combined issue hopefully represents a low point for the year. A special church project - audio system and stage lighting system for a youth choir musical - has absorbed an increasing amount of time over the past few months. This extra load, added to a backlog lasting from before the '72 Indoor WCh, effectively scuttled not only the Mar. '73 issue and delayed earlier issues, but also shut down almost all correspondence and all personal recreation activity. As distasteful as this is to me, post cards will likely be used to make some kind of response to many letters stacked up. Even so, it may some time before matters return to normal; increased responsibility coupled with a 9½ hour work day at Texas Instruments will continue to slow outside activity. Bear with me, and thanks for your patience!



### NIMAS Postal Meet

The original announced deadline for entry in the 1973 NIMAS Postal meet has come and gone; due to the delay in everything else around here, additional entries will be accepted from contests flown as late as May 6, 1973. Since this will probably preclude publication of results in the May issue, mailing deadlines will be relaxed also.

### '73 Nats

The last INAV announced the '73 Nats site as Oshkosh, Wis., on Aug. 6-12, 1973. There still has been no firm announcement of the indoor site; it is a strong possibility that the Chicago army used in past years will be used again. For those who are fretting about how to plan for indoor events, there is little likelihood of having a site in that area substantially different from the army.

### FAI INDOOR REPORT

#### Time Is Short!

May 15, 1973 is the deadline to enter this Team Selection Program. By that time you must have registered and flown in either a local indoor contest or a Local Qual. Trials, or shown that you would have had to travel 200 miles or more to qualify, or if you have qualified for a previous Team Selection Program and wish to bypass the Local Qual., or have placed in the top five in Stick, Cabin or Paper at the '72 Nats. In the last three cases, you may apply to Program Administrator Bob Champine, P O Box 6213, Newport News VA 23606 for waiver to enter the Semi-Finals.

#### Semi-Final Listing

An extra effort will be made to get the May '72 issue out on time (about May 15). All CD's who plan to hold a Semi-Final Qual Trials should send this info to Box 545, Richardson TX 75080 for listing in INAV.

#### Local Trials Listing

OKLAHOMA - Tulsa: Apr. 27, 1973, beginning 5:30 pm at the National Guard Armory. Contact Bob Durham, P O Box 7151, Tulsa OK 74105 for details.  
 TEXAS - Ft. Worth: Indoor contest opportunity to qualify on Apr. 29, 1973, at American Airlines hangar, GSW Airport, Ft. Worth, Texas. Contact Bud Tenny, Box 545 Richardson TX 75080, 214-235-4035 for details.

#### Qualification Trial Results

LIVINGSTON, NJ LOCAL QUAL. TRIALS, Mar. 2, 1973

1. Dan Domina	9:14
2. Ed Franklin	9:01
3. John Triolo	8:54
4. C. V. Russo	8:52
5. Don Garofalow	8:24
6. John Kukon	8:14
7. Stan Stanwick	8:11
8. Manny Radoff	8:09
9. Ernie Kopecky	7:57
10. Bill Landrum	7:25

Ten entries; all qualify via 75% of winning score.

FAI LOCAL QUAL. TRIALS, Hampton Va. Apr. 14-15, 1973

1. Hal Crane	21:45	22:08	43:53
2. Bob Platt	20:07	19:43	39:50
3. Tom Vallee	19:38	18:03	37:41
4. Fred Harlow	18:03	18:45	36:48

Four entries; all qualify via 75% of winning score.

#### TOP TEN CEILING DODGERS

Name	Time	Ceiling	Fudge	Score
1. Stan Chilton	1115	35'	1.0	1115
2. Tom Vallee	810	20'	1.323	1071.6
3. Hal Crane	682	20'	1.323	902.3
4. Dick Hardcastle	602	23'	1.234	742.9
5. Hewitt Phillips	528.2	20'	1.323	698.3
6. Charles Learoyd	525	25'	1.183	621.1
7. Howard Haupt	456	22'	1.261	574.5
8. Harry Cook	471	26'	1.16	546.4
9. Bill Langley	421	27.5'	1.128	474.8
10. Jim Davidson	280	13'	1.64	450.2

RECORDS? MAYBE!

CHICAGO AERONUTS INDOOR MEET, Mar. 25, 1973, Cat. II  
 Brig. Gen. R. L. Jones Armory, Chicago, Ill.  
 Jr. Cat. II Helicopter, 1:59.2, Mindy Linstrum  
 Jr. Cat. II Autogyro, 0:55, Mindy Linstrum  
 LIAMAC INDOOR RECORD TRIALS, Mar. 31, 1973, Cat. I  
 Sr. Cat. I Helicopter, 4:32.0, Ronnie Stransky  
 Jr. Cat. I Autogyro, 0:13.0, Richard Whitten

HAMPTON BRAINBUSTER'S FAI LOCAL QUALS, Apr. 14-15, 1973  
 Willis School, Hampton, VA, 20' 1" ceiling  
 AMA Cat. I FAI - 21:45, Hal Crane  
 FAI Cat. I FAI - 22:08, Hal Crane

An almost-record: The time was right, but there was a mix-up and neither CD had arranged for a sanction! So, Steve Wittman's 1:49.1 and Ron Wittman's 2:59.1 were not eligible for records even though they exceeded existing record times. Also, Bob Randolph sneaked close to the Cat. III Stick record with 43:15.

CONTEST CALENDAR

CALIFORNIA - Santa Ana  
 Indoor RT at Santa Ana May 26-27, June 23-24, 1973.  
 Contact Bob Randolph, 25145 Lawton Ave., Loma Linda CA 92354 for details.

CANADA - British Columbia  
 Contests in the 90' Agrodome in Port Coquitlam will be held on June 30, Oct. 6 and Nov. 17-18, 1973, with Scale, HLG, PennyPlane and FAI Indoor. Contact Alan Riches, 1568 Celeste Cres., Port Coquitlam, B. C. Canada for details.

CONNECTICUT - Glastonbury  
 Indoor contest at Glastonbury High School, 8 am to 5 pm, May 13, 1973. HLG, Easy B/PennyPlane, AMA Cub, Slek Streak, Peanut Scale. Indoor sessions May 20, June 17, 1973, 8 am to 12 noon. Contact George Armstead, 89 Harvest Lane, Glastonbury CT 05073, ph. 203-633-7836.

FLORIDA - Miami  
 Indoor contest at Youth Fair Exhibit Building, at SW 107 Ave. and Coral Way, Miami, May 20, 1973. Contact Dr. John Martin, 3327 Darwin St., Miami FL 33133 for more details.

ILLINOIS - Chicago  
 Indoor contest Apr. 28-29 and Record Trials in May 1973. Contest events: PennyPlane, Paper Stick, Indoor Stick, HLG, Tern Aero, Flying Scale. Pete Sotich, 3851 W. 62nd Place, Chicago IL 60629.

MASSACHUSETTS - Amherst  
 Indoor session at Univ. of Mass. in Amherst on May 13, 1973. Contact Charles Learoyd, 100 Mill Valley Rd., Hadley MA 01035 for details.

MISSOURI - St. Louis  
 Indoor contest at East St. Louis Armory on June 2, 1973. HLG, Easy B, Paper Stick, Indoor Stick, Scale, Peanut, Tern Aero and Delta Dart. Contact Jim Bennett, 324 Helfenstein, St. Louis MO 63119, 314-962-5271.

NEW JERSEY - Lakehurst  
 Sessions set for Hangar #5 on May 6, May 27, June 10, July 1, 19 3. Out-of-town fliers should contact C. V. Russo, 143 Willow Way, Clark NJ 07066 on Friday to be sure military priorities have not pre-empted the facilities.

NEW JERSEY - Princeton  
 Indoor contest at Jadwyn Gym, Princeton Univ., Princeton, NJ, 9 am to 5 pm, May 20, 1973. HLG, Paper Stick, Scale, Paper Glider. Contact John Kukon, 14 Brandon Rd., Trenton NJ 08638 for details.

NEW YORK - Hicksville  
 LIAMAC Indoor Contest Apr. 29, 1973, 8 am to 5 pm, at Cartiague Park, Hicksville, L. I. NY. HLG, Easy B, Peanut Scale, Indoor Scale, Indoor Stick. W. Dunwoody, 985 Ft. Salonga Rd., Northport, L. I. NY.

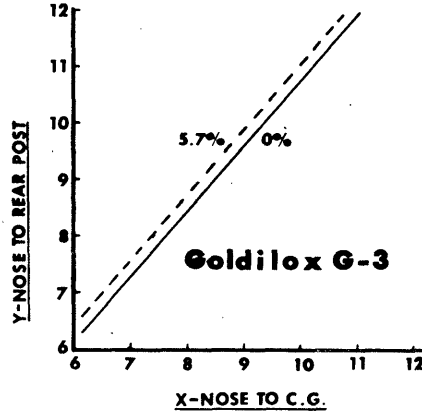
TEXAS - Ft. Worth  
 Indoor contest at American Airlines Hangar, GSW Airport, Ft. Worth, TX. HLG, PennyPlane, Easy B Peanut Scale. Bud Tenny, Box 545, Richardson TX 75080, ph. 214-235-4035.

STATE OF THE ART

Goldilox G-3 is an excellent low ceiling model, as it proved in a series of sessions at the University of Tulsa last summer. Stan Chilton's latest bird was quite consistent, as he charted the drift patterns of the John Mabee Gym. Once the drift patterns were mastered it was simple to launch the model with essentially the same power as had been used on countless flights. In fact, drift patterns and other aspects of hall metrology is the second half of

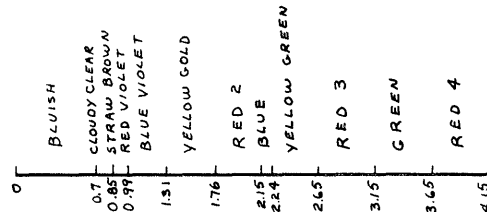
high Cat. I and Cat. II performance; the first half is the model. In fact, G-3 actually "flew the pants off" Stan as he practiced time and again charting the drift. As the day wore on, a minor split in Stan's apparel steadily worsened. Finally, during an excursion to the top of an obstruction to retrieve the model, Stan found himself hobbled effectively and had to be rescued with loaned pants!

The model itself bears the stamp of Stan's fine workmanship, and features advanced design ideas and fine trim. The prop is non-helical in pitch, with both tip and hub areas washed out according to the info shown on the plan. Other features include Kowalski-type airfoil, high aspect wing and stab, and quite light weight. CMOS static margin was +5.7%.

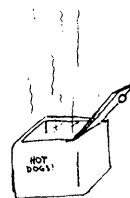
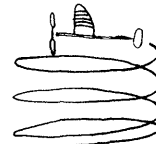


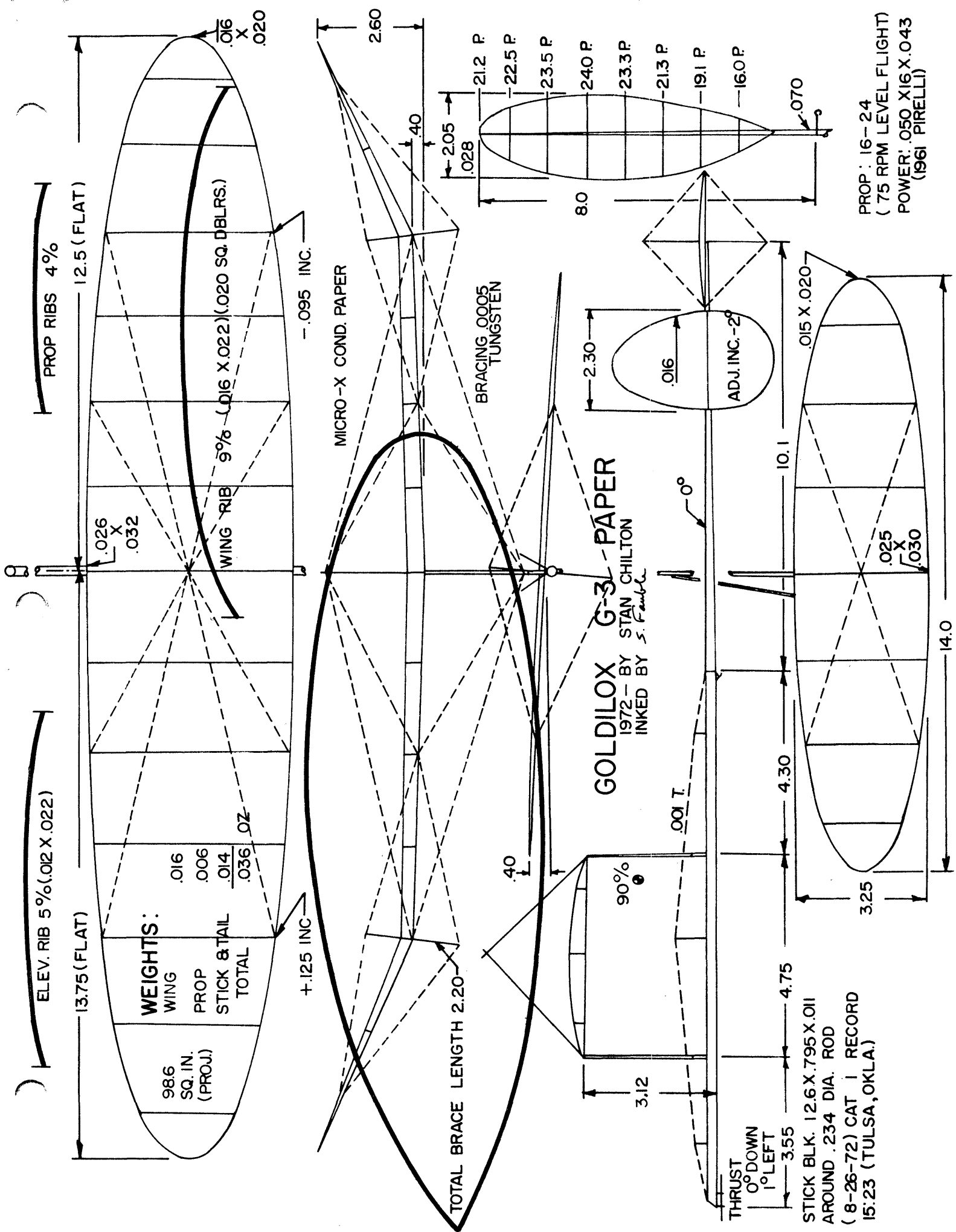
MICROFILM THICKNESS

In the Nov. '63 INAV Bill Bigge explained how he managed to measure the thickness of microfilm, then presented the scale of color vs. thickness shown below. The units shown are arbitrary, but can be translated thus: 1.0 on the scale is approximately 8 microinches (.000008"). In other words, red violet (the very first true color in the range) is about 8 microinches thick and the blue is twice as thick. Some builders call the straw brown color gold, which is half as thick as Bill's designation yellow gold. Incidentally, it is risky to use film thinner than straw brown, since the cloudy clear region covers about a 4:1 range of thickness, all of which is quite likely to be very brittle. Because of the wide range of thickness, it is impossible to determine the properties of clear film and straw brown is already borderline.



Pat Percival





PROP: 16-24  
 (75 RPM LEVEL FLIGHT)  
 POWER: .050 X 16 X .043  
 (1961 PIRELLI)

### INSTANT NEUTRAL POINT

The Jan. '73 INAV had a review and recap of the CMOS balance method. In the past two or three years, Hal Crane has been developing another system to locate the neutral point - or to put it another way, compute the static margin. It was pointed out in the CMOS article that the basic chart was developed for A-2 towline, and thus does not exactly fit indoor models. However, it does have a provision for different aspect ratio of wing and stab, thus allowing comparison of reasonably diverse designs. Hal's method can be adapted to various designs by using a different chart for each subgroup, but the chart shown on page 5 is "peaked" for low aspect ratio designs such as are now common in one gram FAI. PennyPlanes follow this same basic trend, and should also work well on this chart.

The CMOS method requires considerable computation and construction of a graph which is then applicable to all models built to that exact design. Hal's method calls for less computation, but requires several guesses. At this time, several years of experience with CMOS has pinpointed the best range of balance points, but this advantage can be rapidly overcome if people using Instant Neutral Point will give feedback on the results. Hal's own "best guess" is to use at least 10% static margin; that is, the C.G. should be at least 10% of the average wing chord ahead of the neutral point.

A couple of examples will illustrate the method of using INP. First, let's compute the static margin of a hypothetical model which has been completed and flown, to see how it should have been trimmed. This model will have the following design: constant chord wing and stab with 7" x 25" wing and 4" x 18" stab. Fuselage and tail boom dimensions, plus wing location, will be as shown in Fig. 1. The basic procedure is as follows:

1. Compute average chord of wing ( $C_{w,ave}$ ) and stab ( $C_{t,ave}$ ). Note that the example model has constant chord wing and stab, which is a special case. See the CMOS discussion (Jan. '73 INAV) for computing average chord of tapered wings.
2. Measure (on existing model) or compute (on model under construction)  $l_t$  (tail length, or tail moment arm).
3. Divide  $l_t$  by  $C_{w,ave}$ .
4. Divide stab area ( $S_t$ ) by wing area ( $S_w$ ).
5. Refer to the INP chart (p. 5) and extend the line corresponding to the proper  $S_t/S_w$ .
6. Move vertically from the computed value  $l_t/C_{w,ave}$  on the X-axis of the chart to the extended line, then across to the neutral point (NP) on the Y-axis.
7. Compare the NP location with the CG location.

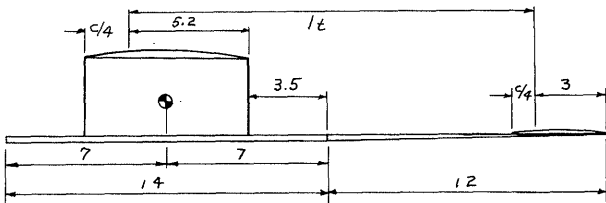


FIG. 1

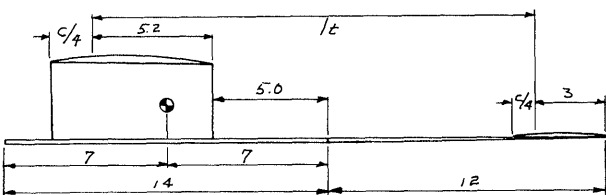


FIG. 2

Working with the specified dimensions of our "tested" model, the following figures come out:

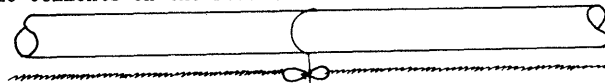
1.  $C_{w,ave} = 7$ ,  $C_{t,ave} = 4$ .
2.  $l_t = 17.7$ ". (From Fig. 1, note that  $l_t$  is defined (as in CMOS method) as the distance from  $C/4_{wing}$  to  $C/4_{tail}$ . That is from 25% of the average chord on the wing to 25% of the stab average chord. Thus, from Fig. 1  $l_t = 9 + 3.5 + 5.2 = 17.7$ ).
3.  $l_t/C_{w,ave} = 17.7/7 = 2.53$
4.  $S_t/S_w = 72/175 = .41$ . Refer to p. 5 and note that the line corresponding to .41 has been extended (step 5). Note that this line is the same for all models built to this same design.
6. Following the light line, NP is shown to be 79.5%  $C_w$ . In other words NP is 20.5% or 1.43" ahead of the rear wing post.
7. Since the CG is 7 - 3.5 or 3.5" ahead of the rear wing post, the static margin is  $3.5 - 1.43 = 2.07$ . Then,  $2.07/7 \times 100\% = 29.4\%$  margin. Since Hal recommends about 10% margin, the hypothetical model is trimmed too far forward; as a result both the flight efficiency and the rafter banging qualities will be impaired.

Fig. 2 and the following discussion will illustrate the trial-and-error method for proper wing location. From the example above, we can assume that the wing will have to be moved forward. Therefore, assume a wing location 5" ahead of the rear hook, or 1.5" ahead of the original location. Then the new  $l_t = 17.7 + 1.5 = 19.2$ ", and  $l_t/C_{w,ave} = 19.2/7 = 2.74$ . From the graph, NP = 82.4%, and NP is 17.6% of 7 or 1.23" ahead of the rear post. The CG is now only 2" ahead of the rear post (trial location) and the margin would be  $2 - 1.23 = .77$ .  $.77/7 \times 100\% = 11\%$  margin, well within proper limits.

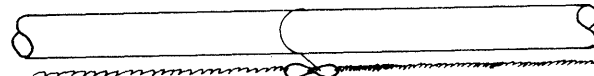
Why another method to compute static margin? What is it with this guy, anyhow? Simply this: it is the personal belief of many top fliers that computation of static margin is one of the major shortcuts to high-level performance. Most certainly it is possible to trim models at other margins and get respectable performance. However, once anyone tries balancing models with some method of static margin rather than by some arbitrary CG location, they usually continue regardless of the bother of computation. It is a measure of my own conviction that this is vital that I take time to compute CMOS on all models presented. In the future, INP will also be given for all models with low aspect ratio wings.

### A LOOK AT YESTERYEAR

Back in 1936, there used to be a magazine called MODEL AIRCRAFT BUILDER. In one of these, Louis Garami suggested a gadget which was intended to help control model altitude in low ceilings. The device consisted of an S-hook and a wire pin. Two motors, shorter than the usual single motor, are hooked to the S-hook and to the prop and rear hook, so the S-hook is in between the motors. The pin mounts to the motor stick and prevents the S-hook from turning for a while. The sketch below shows (top) both motors wound and the pin engaged in the S-hook. The second sketch shows the rig as the front motor is mostly unwound; the S-hook has moved back almost enough to disengage the pin. The intent is for the model to climb on the power of the front motor, then drop down as the second motor rewinds the front motor enough for a second climb (but not as high). He also suggested that the pin location (and relative motor lengths) can be adjusted to tailor the climb pattern. Now - has anyone tried this idea? If so, how about some comments on the results?



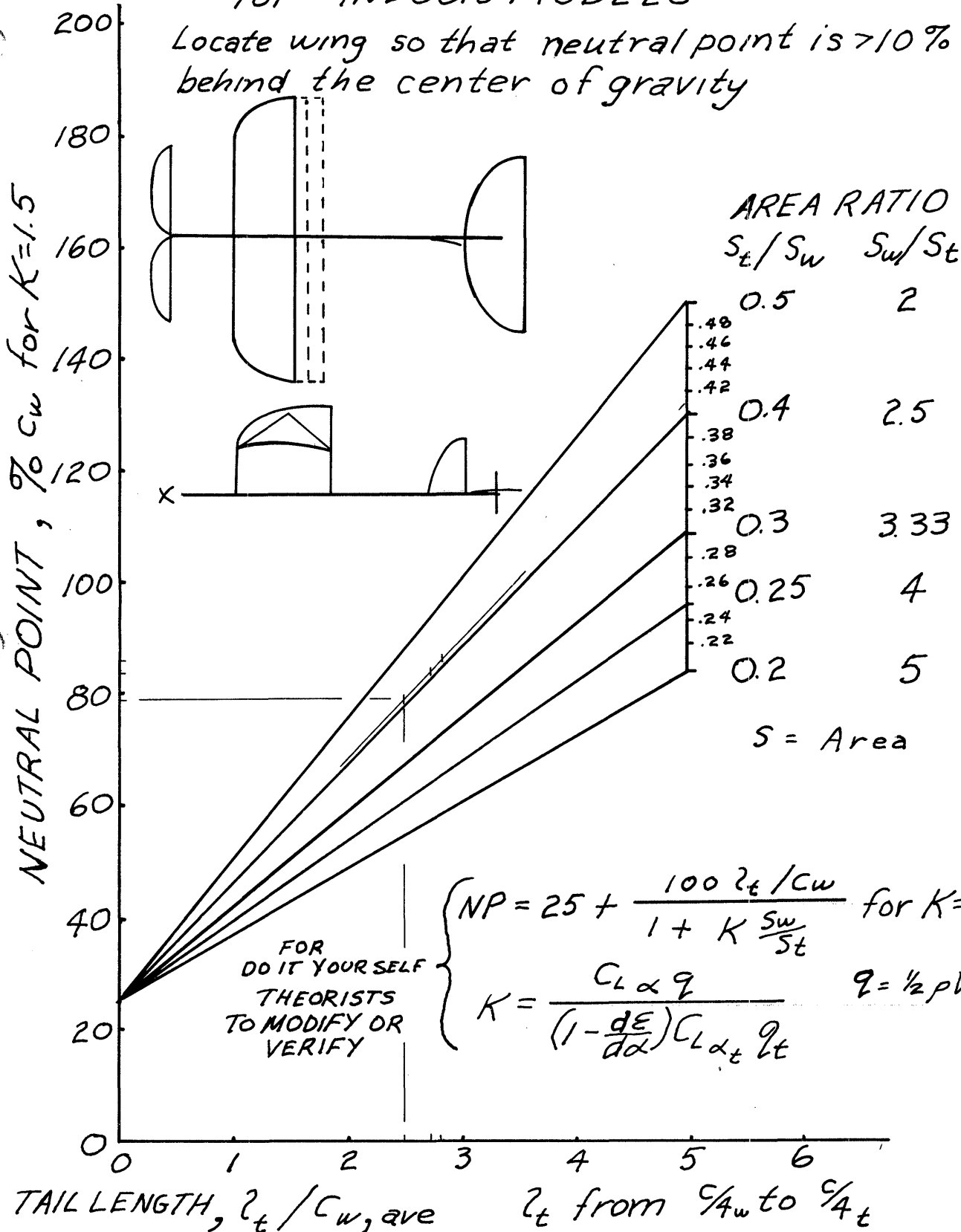
BOTH MOTORS WOUND



FRONT MOTOR UNWOUND

# INSTANT NEUTRAL POINT for INDOOR MODELS

Locate wing so that neutral point is  $> 10\%$   $C_{w,ave}$  behind the center of gravity

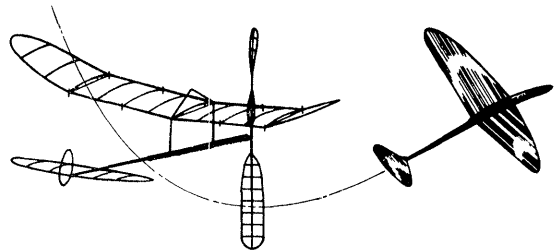


$$NP = 25 + \frac{100 \ell_t / C_w}{1 + K \frac{S_w}{S_t}} \text{ for } K=1.5$$

$$K = \frac{C_L \alpha q}{(1 - \frac{dE}{d\alpha}) C_L \alpha_t q_t} \quad q = \frac{1}{2} \rho V^2$$

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

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

\*\*\*\*NATIONAL INDOOR MODEL AIRPLANE SOCIETY\*\*\*\*New Members!

STEVEN L. BROWN, 815 West Court St., Janesville WI 53545  
 BILL CULLEN, 9 Honey Dr., Syosset NY 11791  
 ROBERT L. PERKINS, M.D., 2285 Pinebrook Rd., Columbus,  
 OH 43220

Family Memberships

ROBERT L. PERKINS, Jr., 2285 Pinebrook Rd., Columbus  
 OH 43220

Change of Address

ROBERT HABERSTROH, 1109 W. Harmony Rd., Ft. Collins  
 CO 80521

'73 Nats

It has been confirmed that the Brig. Gen. R. L. Jones Armory, 5200 South Cottage Grove, Chicago, Ill., will be the '73 Indoor Nats site. The activity there will be run on a self-sufficient basis - from registration to trophy presentation each day. More details on this are available from your entry blank which must be sent (postmark) no later than midnight, June 29, 1973. If you have not yet received an entry blank, send a stamped, self-addressed envelope to AMA HQ and request one.

Indoor HLG will be held Sunday, 9 am to 3 pm, with Indoor Scale following, 3 pm to 9 pm. On Monday, Indoor Stick, Paper Stick and Indoor Cabin will run 9 am to 9 pm.

As of this writing, no word has been received on when PennyPlane will be held; presumably, it will be held concurrently with Indoor Scale. Peanut Scale will be sponsored by the Detroit Cloudbusters and Navy Scale will be sponsored by the Miami (Florida) Indoor Aircraft Association; both events will be held concurrently with Indoor Scale.

Nats Reporters Needed!

Wanted: volunteers to report on all Nats indoor activity. This can range from reporting isolated but interesting events to a full report; also pictures of as much of the activity as possible. With your help, it can be a top level report - just drop me a line and let me know that you can help. I expect to be there, but with duties which will preclude much observation and reporting.

Recent Publications

A short but interesting article, "Indoor Flying", by Paul Wahl (a neighbor of Pete Andrews) appeared in the May '73 Science and Mechanics magazine. Even though this was a short article, a mention of NIMAS at the end has brought many, many requests for more information. This ought to tell us something about the importance of indoor activity being reported in the national press!

Full size plans and a humorous account of Ron Wittman's record HLG "SuperSweep 22" appears in the April '73 NFFS Free Flight Digest. "Super Editor" Bob Meuser finds time for such goodies besides putting out the whole thing - and the Digest is excellent, in case you haven't seen it.

Nimas Postal Meet

A final reminder - get your entries in for the 1973 NIMAS Postal Meet. Due to the lateness of the Mar/Apr issue, entry was extended to include meets flown as late as May 6, 1973. Please get the entries in by May 25, so it will be possible to tabulate the results for the June '73 issue.

FAI INDOOR REPORTEntry Deadline

Exception was taken to the announcement last month that interested fliers must enter the Program by May 15, 1973. The date was incorrect (should have been May 27), but it is my interpretation that all fliers must have

entered before the end of the time allotted for Local Qual Trials. Even though fliers may qualify for entry into the Semi-Finals by exemptions detailed last month, it seems reasonable that one must be entered in the Program before he can petition the Program Director (Bob Champine) for an exception under the Program rules. Either way, the cost is the same and if you enter before May 27, you just gotta be in line!

Team Selection Trials ScheduleSemi-Final Trials

SANTA ANA - Tentative date - June 23-24, 1973. Bob Randolph, 25145 Lawton Ave., Loma Linda CA 92354.

DETROIT - Tentative date - June 2, 1973. Paul Crowley, 32604 Tecla Dr., Warren MI 48093 ph. 313-294-0266.

EAST COAST - Hangar #5 dates - May 27, June 10, July 1; contact C. V. Russo, 143 Willow Way, Clark NJ 07066.

SOUTH CENTRAL - Contact Bud Tenny, Box 545, Richardson TX for info.

Qualification Trials Results

TULSA LOCAL QUAL TRIALS, Apr. 27, 1973 Cat. II  
 15th Street Armory, Tulsa Okla. 37' ceiling.

A. D. Coe	20:28
R. J. Dunham	18:50
Stan Chilton	16:48
Robert Dunham II	15:59
John English	15:46

RECORDS? MAYBE!

CHICAGO AERONUTS INDOOR CONTEST, Apr. 28-29, 1973 Cat. I  
 Meeting Room, Madison St. Armory, 20' ceiling.  
 Cat. I Jr. Autogyro - 0:46.2, Mindi Linstrum

CONTEST CALENDAR

CALIFORNIA - Santa Ana  
 Indoor RT at Santa Ana May 26-27, June 23-24, 1973.  
 Contact Bob Randolph, 25145 Lawton Ave., Loma Linda CA 92354 for details.

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 Contests in the 90' Agrodome in Port Coquitlam will be held on June 30, Oct. 6 and Nov. 17-18, 1973, with Scale, HLG, PennyPlane and FAI Indoor. Contact Alan Riches, 1568 Celeste Cres., Port Coquitlam, B. C. Canada for details.

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 Indoor contest at Glastonbury High School, 8 am to 5 pm, May 13, 1973. HLG, Easy B/PennyPlane, AMA Cub, Sleek Streak, Peanut Scale. Indoor sessions May 20, June 17, 1973, 8 am to 12 noon. Contact George Armstead, 89 Harvest Lane, Glastonbury CT 05073, ph. 203-633-7836.

FLORIDA - Miami  
 Indoor contest at Youth Fair Exhibit Building, at SW 107 Ave. and Coral Way, Miami, May 20, 1973. Contact Dr. John Martin, 3327 Darwin St., Miami FL 33133 for more details.

MICHIGAN - Detroit  
 Tentative date for State Meet - June 2-3, 1973. Contact Walter Hartung, 14759 Kilbourne, Detroit MI 48213, ph. 313-LA7-7620 for details.

MISSOURI - St. Louis  
 Indoor contest at East St. Louis Armory on June 2, 1973. HLG, Easy B, Paper Stick, Indoor Stick, Scale, Peanut, Tern Aero and Delta Dart. Contact Jim Bennett, 324 Helfenstein, St. Louis MO 63119, 314-962-5271.

NEW JERSEY - Lakehurst  
 Sessions set for Hangar #5 on ~~May 6~~, May 27, June 10, July 1, 1973. Out-of-town fliers should contact C. V. Russo, 143 Willow Way, Clark NJ 07066 on Friday to be sure military priorities have not pre-empted the facilities.



**NEW JERSEY - Princeton**

Indoor contest at Jadwyn Gym, Princeton Univ., Princeton, NJ, 9 am to 5 pm, May 20, 1973. HLG, Paper Stick, Scale, Paper Glider. Contact John Kukon, 14 Brandon Rd., Trenton NJ 08638 for details.

**OKLAHOMA - Tulsa**

Cat. II-(?) III(?) Record Trials in American Airlines Hangar (FAI Finals site) 3800 N. Mingo Rd., Tulsa OK. Contact Bob Dunham, Box 7151, Tulsa OK 74105, ph. 918-747-0720 for details. Assemble in front of American Airlines administration building at 10 am for directions to hangar.

**TEXAS - Ft. Worth**

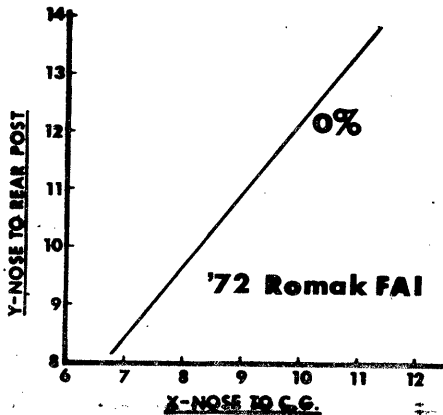
Tentative date - June 3, 1973 - American Airlines Hangar, Greater SW Airport, Ft. Worth, Tex. HLG, PennyPlane, Easy B, plus Peanut Scale pending arrangements for judges. Bud Tenny, Box 545, Richardson TX 75080 ph. 214-235-4035.

STATE OF THE ART

Bud Romak's models showed very high capability, as he posted 36:04 in the sixth round at the '72 Indoor WCh, in air which was beginning to deteriorate. The model shown is quite similar to the design which placed him on the Team, and was developed especially for the '72 Champs.

During his model development program, Bud tried wide chord wings twice. Both times he had problems which indicated that a wide chord configuration was not reliable for WCh conditions. As a result, he has retained a slightly tapered wing with a sort of rounded tip. This configuration has worked well, and any apparent lack of reliability at the WCh could be traced to the way the model could out-climb the site. Certainly, Bud's models were hung as many times as any others!

The CMOS diagram below gives the 0% balance point, and Bud's indicated set-up showed 0% also. On Crane's Instant Neutral Point chart (Mar/Apr '73 INAV), the static margin checked out at +9.5% - almost "perfect" according to Hal's suggested margin.



INDOOR CONSTRUCTION TECHNIQUES

The Braced Motorstick - Part I

The information presented here is gleaned from past INAV's and from material presented by several fliers since this topic was last discussed.

One gram FAI models are relatively high powered by the standards of normal indoor models - not in ratio of rubber weight to airframe weight - but in brute power. That is, a one gram model will likely have up to 1.5 grams of rubber, and very possibly motorstick lengths rivaling that of a "300". As a result, motorstick stress soars well above that for normal indoor models, particularly in the heat of WCh competition. Even with a required extra weight (65 cm models "gained" 50% in weight, on the average, when the one gram rule came in), it is important to get the maximum strength/weight ratio for the motorstick. After all, wider wings are heavier and so are the stubs. Larger rubber calls for larger props to handle the brute power, and increased flight stresses require stronger tail booms. It all adds up quickly, and not many extra milligrams are left to beef up the motorstick.

One of the more popular types of stick bracing is the double wire bracing, illustrated in A. This illustration, along with B, C, D and E, gives details of the motorstick construction used by Al Rohrbaugh. B shows important details of the bracing post construction; most important is that sharpened posts stick through the motorstick and are glued at both entry and exit points. After glueing the exit points, the tiny tips can be cut off and covered with another skin of glue. C illustrates one method of reinforcing the thrust bearing area - a 1/32" sq. post is stuck through the stick at the critical stress area. In

similar fashion, the rear hook (D) is reinforced also. E shows an important detail about mounting wing posts. First, a wood plug is installed in the bottom of each socket; second, a small hole in the bottom of the motorstick allows glue to be applied to the bottom of the plug to insure that the socket is firmly anchored. After all, a loose wing socket can cause erratic flying by allowing the wing washin/washout to change; only careful examination will reveal this problem before it worsens enough to be obvious.

Illustration B shows that the bracing posts are 45° apart, which allows them to strengthen the stick in both bending and torsion. It is important that these angles be correct and uniform at each bracing location; F and G are two views of Al's drilling guide which makes it possible to locate the holes accurately. Note especially that the two guide holes are staggered slightly so that the braces will slide past each other.

The usual method of reinforcing the stick at the rear hook and thrust bearing is to use a vertical web inserted inside the stick. Bob Randolph reported Erv Rodemsky's method as shown in H and I. Here the front cap is first installed, then a slot is made to just fit the web. This slot is slightly harder to make than it is to insert a web, but the major advantage is that the glue seams can be properly made. One method of making the slot is to make a single cut with a razor saw and then carefully shave away excess wood with a sharp double edge blade. Note that the grain of the web is always vertical, no matter how the web is installed.

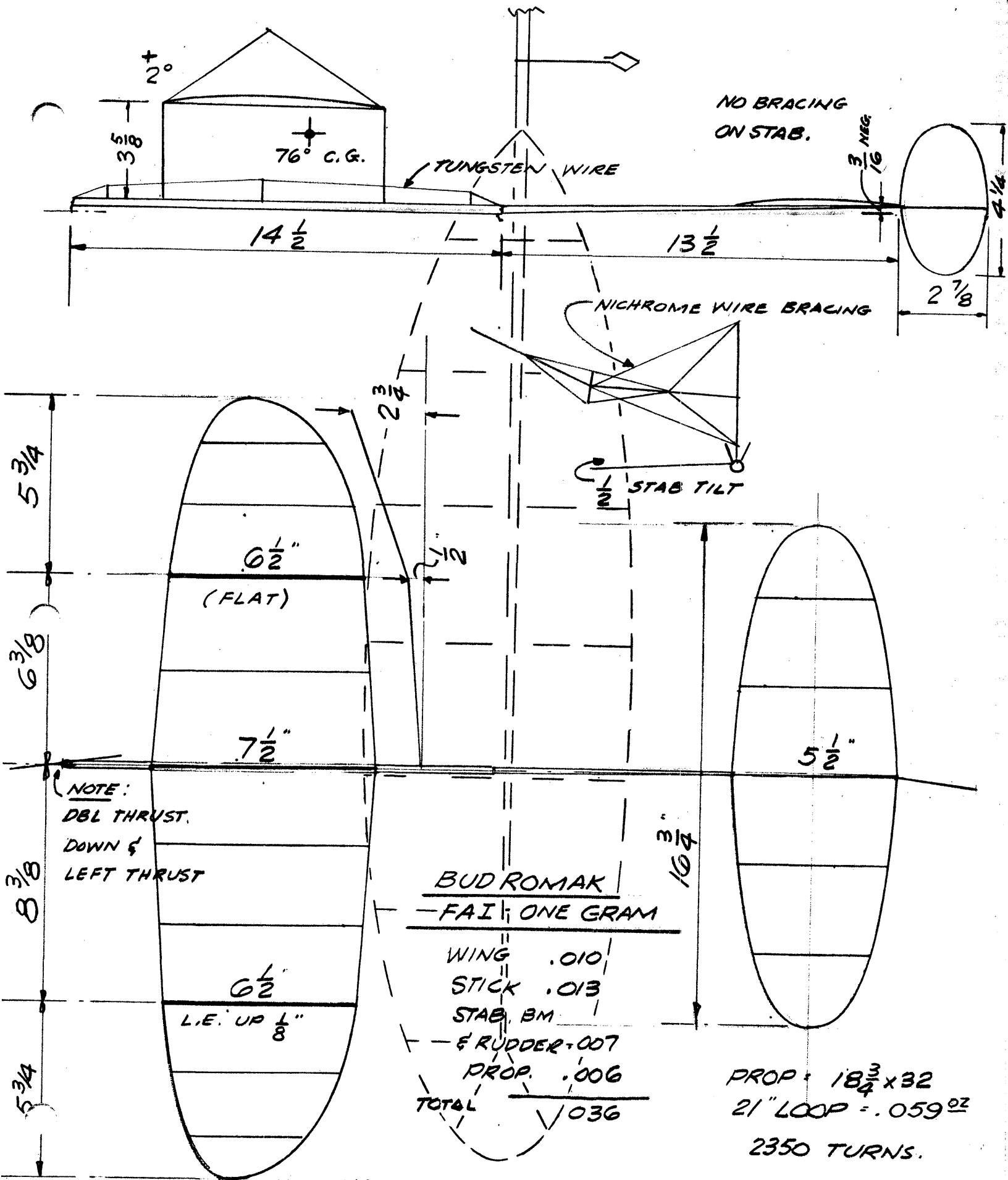
The question sometime arises, "What is the best way to get a straight motorstick?" J shows a method for holding the seam closed while it is being glued. The rolled and dried stick is placed between two straight blocks which are then brought together just enough to close the seam. It is necessary that these blocks be over 1/2 as high as the stick diameter; it is convenient that they be thinner than the stick diameter. After the seam is held closed - just touching - carefully apply glue to the seam and avoid using excess glue. Prior to this time, however, careful work will help produce a straight stick. Choose wood that is uniform in thickness and grain pattern, with grain running straight along the sheet. Roll and bake the tube in the usual fashion, then remove it from the form. At this point, if the rolled tube is not straight, do it over. It is too much to ask of a glue joint that it do more than hold the seam closed; if the stick is stressed by being forced straight from a crooked state it will eventually pull crooked.

Illustration K shows a motorstick by Jim Richmond. Note particularly the stick reinforcement and the variation of plug in the wing socket. Also, the Scotch-type thrust bearing has been modified by making a spiral hook which holds the rear of the prop shaft in line. The hook is engaged with the prop shaft by a twisting motion as the shaft is moved back.

CONTEST RESULTS

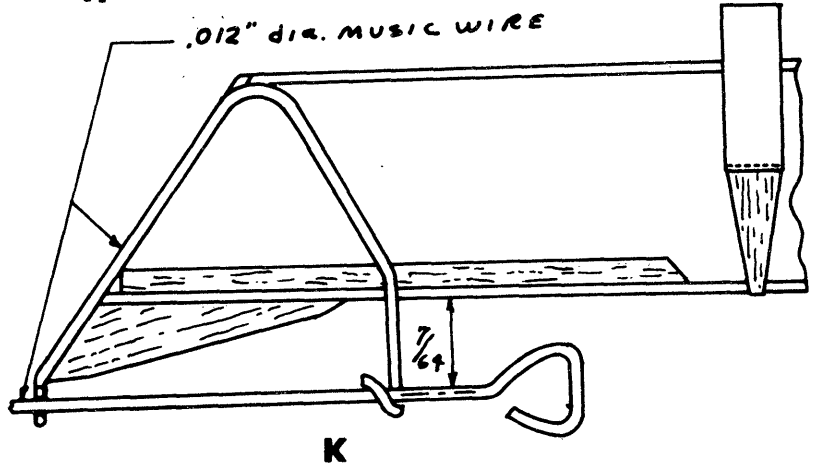
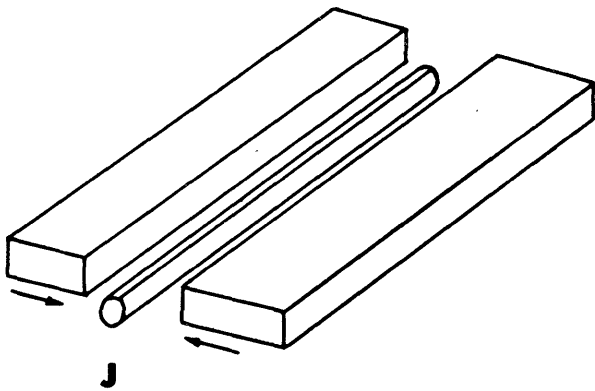
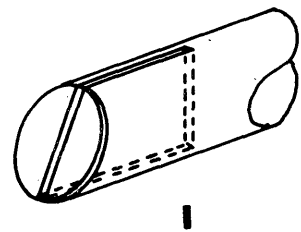
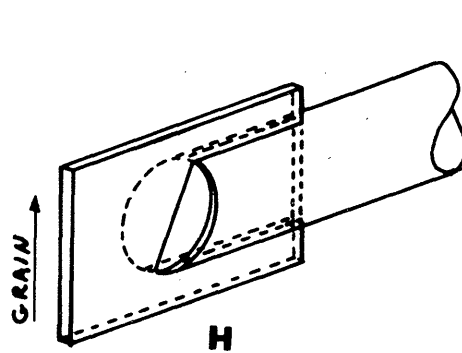
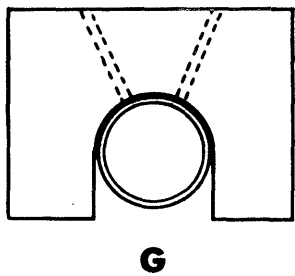
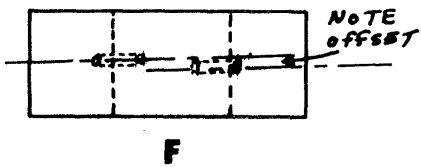
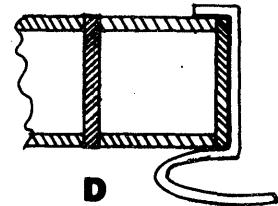
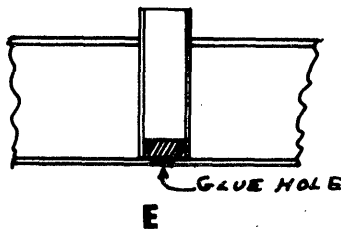
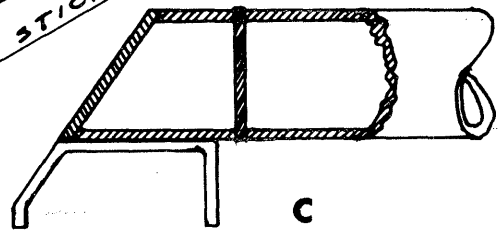
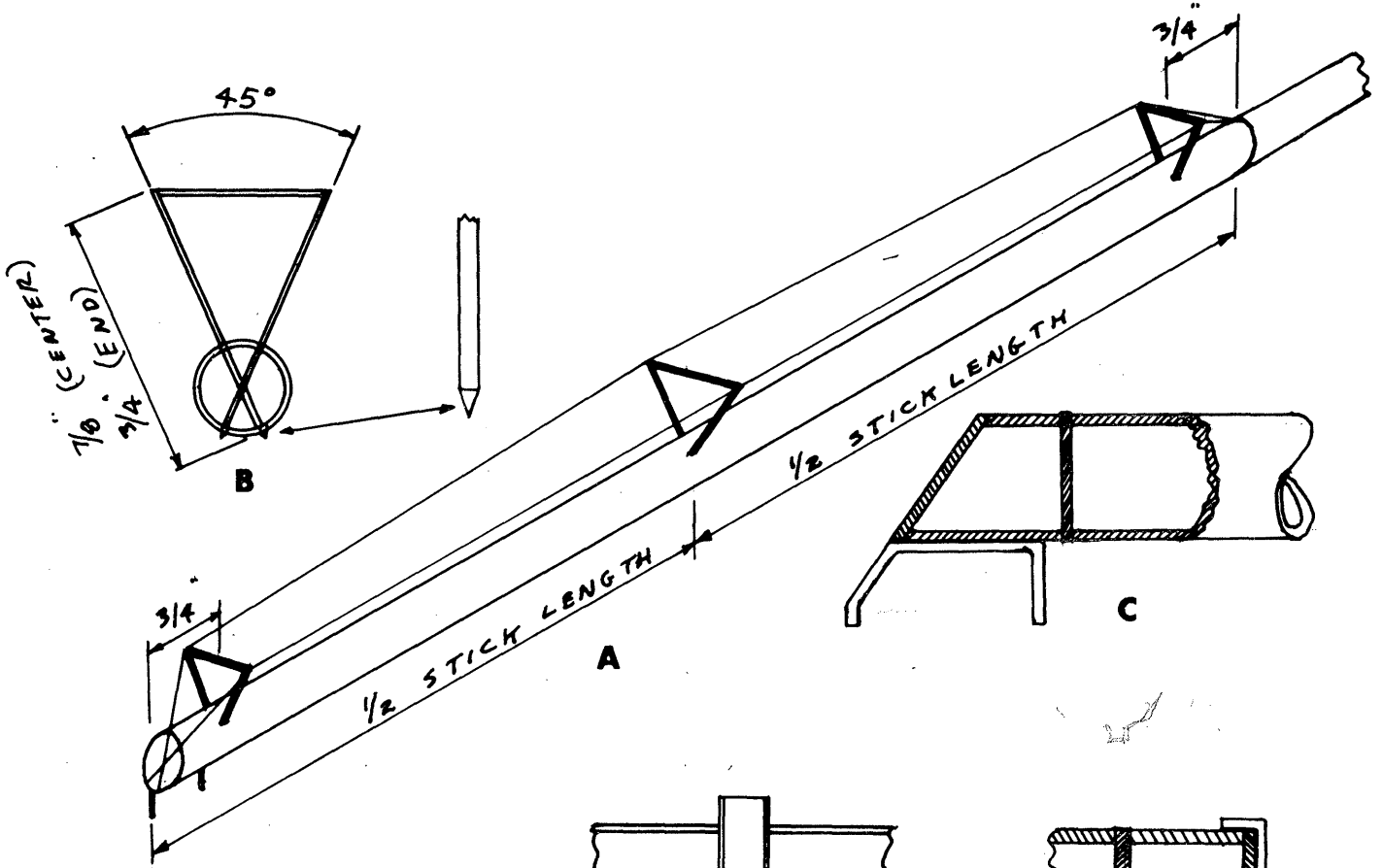
ILLINOIS MODEL AERO CLUB INDOOR CONTEST, Apr. 1, 1973  
Brig. Gen. Jones Armory, Chicago, Ill. 90' Cat. II

<u>Jr. HLG</u>		<u>Open HLG</u>	
Steve Robbins	77.9	Bob Hayes*	119.9
Jeff Tillou	54.8	Keith Gordey*	115.5
		Mark Kummerow*	115.2
<u>Jr. PennyPlane</u>		Chuck Markos	113.7
Tim Stone	5:54.8	Dan Neumann	112.7
Tim Noonan	5:52.0	Bill Hutchins	107.3
Mindy Linstrum	3:07.0	Don Wright	106.8
		John Loribiecki*	105.8
<u>Sr. PennyPlane</u>		Bob Watson	103.7
Steve Oravec	6:34.0	Tom Neumann	103.8
Keith Gordey	5:55.0	Dick Swenson	100.8
Eric Miller	5:16.4		
		<u>Jr. Paper Stick</u>	
<u>Open PennyPlane</u>		Tim Stone	4:19.5
Dennis Jaecks	9:51.0	Steve Robbins	0:18.2
Rol Anderson	9:44.1		
Hank DeKat	8:45.0	<u>Open Paper Stick</u>	
Bob Hayes	8:07.7	Jim Richmond	16:49.2
Chuck Markos	6:51.0	Dennis Jaecks	16:44.0
Ken Kraemer	5:33.8	A. D. Coe	14:07.2
Bob Elman	3:55.4	Charlie Sotich	11:30.2
Dave Linstrum	2:59.5	Howard Haupt	10:04.6
Tim Banaszak	0:16.0	Jeff Annis	9:41.0
		Clarence Mills	8:42.0
<u>*Senior age contestants</u>		Steve Oravec	7:28.0
<u>Peanut Scale</u>		Keith Gordey	7:05.5
Charlie Sotich	Volksplane	Rol Anderson	5:01.0
Chuck Markos	Piper J3		
Ted Dock	Piper Vagabond		
Ed Fort	S. E. 5		
Mark Kummerow*	Bucker Jungmeister	240.4 Points	
Jim Pulley	Waterman "Gosling"	144.0	
Jim Gerz	Pietenpol Camper	117.0	
Phil Cox	Pietenpol Camper	113.5	
Jim Harris	Helio Super Courier	96.2	
Otto Curth	Heath Midwing	86.6	
		86.0	
		73.8	
		72.1	
		66.9	



NAT. RECORD  
FLT. 35:42  
SANTA ANA CALIF.

BEST TIME AT CARDINGTON,  
ENGLAND - W.C. SIXTH ROUND  
36:04



**BALLOON STEERING - ANOTHER LOOK**

Balloon steering was covered in May '63 and June '65 INAV's. These two articles can be briefly summarized in the following remarks. The basics are simple, and only require practice - the higher the model the more practice becomes important. The most important single thing is to decide when to steer; do not delay in getting the balloon up while you decide. If you safely can do so, put the balloon up if you even suspect you will need it; then you can agonize to your heart's content and you are ready for the decision when it comes. If possible, the balloon should be much higher than the model, and the string must be pretty snug. A loose balloon will only wreck the model or catch the prop, since you can't move it as fast as you need to.

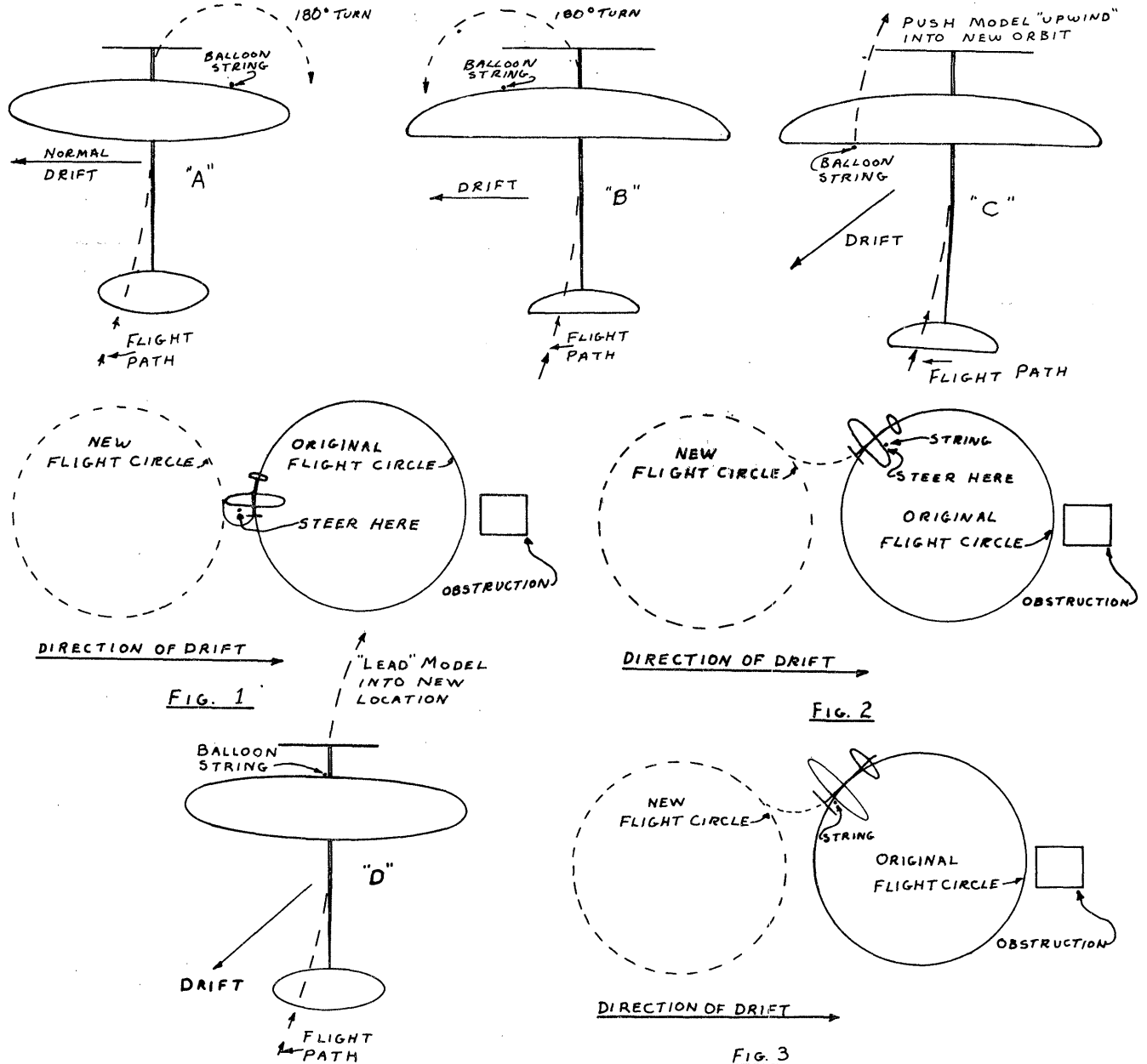
Three methods were discussed before, as illustrated in "A", "B" and "C" below, along with Fig. 1 & 2. "A" is the basic method outlined by Bruce Paton in 1963. The outboard wing is allowed to contact the string, and the model rotates 180° and you release it. Fig. 1 shows the action; the model winds up just over one flight circle upstream of its original orbit. Models in critical trim or those with extreme offset in the wing may either stall off the line or simply slide down the string.

This behavior can be overcome in some cases by using "B" or "C". In "B", the model is contacted on the inboard wing and allowed to pivot as before. Once again, models with critical trim may spin off the line if you do not use

a delicate touch. In "C", the model is contacted just behind the wing and is slowly pushed into a new orbit as in Fig. 2. You must move slowly in order to prevent a stall, but the model generally loses less altitude than with other methods.

An excellent method developed by Bob Champine is shown in "D" and Fig. 3. Incredible as it may seem, Bob passes the string through the prop arc (takes practice and timing to get it right!) and gets the string next to the inboard side of the motor stick. Now, with very careful moves, he "leads" the model where he wants it. It is easy to make one of two mistakes here - either stall the model by a sudden move and catch the prop, or snag the wing or prop as you release the model in the new orbit.

Two comments about rules are in order. First, AMA flights may not be steered; the time stops when you first touch the model. Second, FAI now permits three steers of fifteen seconds each per flight, and this is a lot of time which relieves the pressure somewhat. Although no clear ruling has ever been made, it is the opinion of most U.S. officials that you must break loose at least momentarily at the end of the fifteen second interval. It is to your advantage to do this anyway; if you can't complete a steer in 15 seconds you are either out of position or too tense to do it in unlimited time. Break away, take a couple of deep breaths and try on the next circle!



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

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

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

New Members!

BILL CULLEN, 9 Honey Dr., Syosset NY 11791  
 WALTER E. ESTEN, Box 35F, Lake Shore Dr., Chepachet RI 02814  
 EDWARD LOCKHART, 11611 Oak Creek Dr., Lakeside CA 92040  
 W. T. TURNER, 3027 Rutgers, Long Beach CA 90808  
 LOU YOUNG, 1190 Littleoak Dr., San Jose CA 95129

Renewal Reminder

Those of you who find "07" in the upper left-hand corner of the mailing label for this issue are due to renew your membership as of the July issue. It is very helpful and timesaving for me if renewal is made in advance. A few renewal checks have been accompanied by a note that the required amount was not known; \$3.25 is the current cost of NIMAS membership + INAV.

'73 Nats

All indoor events of the 1973 Nats will be flown at the Brig. Gen. R. L. Jones Armory, 5200 S. Cottage Grove, Chicago, Ill. Indoor HLG will be held from 9 am to 3 pm on Sunday, Aug. 5, 1973, and Indoor Scale will follow until 9 pm. Peanut Scale and Navy Scale will share flying time and space with AMA Scale, while PennyPlane will be held 3 pm to 7 pm at one end of the site. Indoor Stick, Indoor Cabin and Paper Stick will be flown 9 am to 9 pm on Monday, Aug. 6, 1973.

The Armory will be a completely self-contained operation, from registration through trophy presentation each day at the end of flying. For more details on this and other Nats matters, re-read your entry blank and get it in the mail before June 29, 1973. If you haven't received an entry blank, it is just barely possible to air mail your request and return via a stamped, self-addressed envelope!

NIMAS Awards

Silver Cat. I HLG Award - 0:29.6, Dan Domina

Gold Cat. I HLG Award - 0:31.2, Dan Domina

Silver Cat. II HLG Award - 0:50.4, Don Chancey

Gold Cat. II HLG Award - 0:55.4, Don Chancey

Nats Reporters Needed

Last year, a number of INAV readers presented a very good report of Indoor Nats activity. Therefore, space is already allocated (would you believe three pages of text and two pages of photos) in the Aug. '73 INAV for more of the same. Please drop a line to Box 545, Richardson TX 75080, telling of your intent to report; then follow this with text and/or photos as soon as possible after the Nats has finished. Hints, anecdotes, activity - anything except the official results - whatever you think might be of interest, should be sent. If I get a lot, some of it may be shortened or held for another issue. If I don't get very much, there may be a smaller issue!

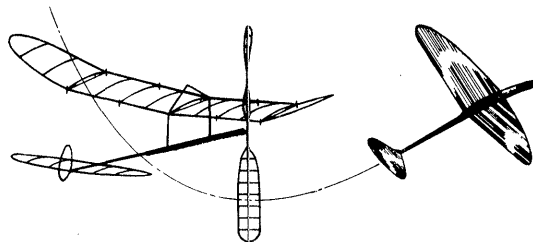
RECORDS? MAYBE

Santa Ana Record Trials, May 26, 1973, Cat. III  
 Santa Ana MCAF, Santa Ana Cal.  
 Open Indoor Stick - 44:50.2, Bob Randolph

North Central Semi-Finals, June 2, 1973, Cat. II AMA  
 State Fair Coliseum, Detroit, 65' cell. Cat. III FAI  
 FAI Cat. III FAI - 25:20, Jim Richmond  
 AMA Cat. II FAI - 25:20, Jim Richmond

FAI INDOOR REPORTWho Qualified?

The usual sources of info open to INAV have seemingly dried up, and very little solid info is available at this time. However, program entry is apparently down by 10% from 1971, and 25% of the entrants are first-time entrants or have not participated for several years. This is the

Plan Ahead

largest turn-over in participation in the history of the Indoor program, which should be of concern to those who will plan future programs.

It is high time that a new program poll be taken, to deal with the program which will pick the team for the '76 WCh. The time is now, of course, since one question needed is whether the next program will be two years long like all the other team selection programs. This issue almost passed in 1971, and very likely will pass on the next asking. Several who voted against a two-year program did not understand the implications of a spread-out program, and several outdoor fliers have noted that indoor activity peaks (with a one-year program) at the same time as outdoor program preparation. This effectively prevents their participation in both programs, which hurts the indoor participation. Another comment from non-participants seems valid: according to present rules, a flier must go all the way through a program before he is allowed to have a voice in the formation of a new program (that is, ballots are sent only to participants of the previous program; not even to the previous administrator). It only seems fair that ballots could be made available to those who register in advance for the up-coming program if they wish to participate in program planning.

Semi-Final Results

North Central Semi-Final - June 2, 1973, Detroit, Michigan State Fair Coliseum, 65' ceiling. 9 entered, 7 qual.

1. Jim Richmond	25:20	24:35	49:55
2. Dick Kowalski	23:15	21:40	44:55
3. Ed Stoll	21:46	22:14	44:00
4. Bill Hulbert	21:47	21:51	43:38
5. Bucky Servaltes	21:23	21:55	43:18
6. Ron Plotzke	20:21	20:27	40:48
7. Al Rohrbaugh	19:00	21:31	40:31
8. Bill Shailor (Senior)	20:23	18:54	39:17
9. Tom Sova (Senior)	20:31	14:35	35:06

80% of 49:55 = 39:55 needed to qualify.

Team Selection Trials Schedule

SANTA ANA - June 23-24, 1973. Bob Randolph, 25145 Lawton Ave., Loma Linda CA 92354, ph. 714-796-9706.

EAST COAST - July 1, 1973, C. V. Russo, 143 Willow Way, Clark NJ 07066, 201-382-0871. (Hangar #5)

SOUTH CENTRAL - June 30-Jul. 1, 1973, American Airlines hangar, Tulsa, OK. Bob Dunham, Box 7151, Tulsa OK 74105, ph. 918-747-0720. Contestants who do not receive instruction sheet regarding entry should contact Dunham or Bud Tenny, Box 545, Richardson TX 75080 ph. 214-235-4035, after June 22, 1973.

CONTEST CALENDAR

CALIFORNIA - Santa Ana  
 Indoor RT at Santa Ana ~~May 26-27~~, June 23-24, 1973.  
 Contact Bob Randolph, 25145 Lawton Ave., Loma Linda CA 92354 for details.

CANADA - British Columbia  
 Contests in the 90' Agrodome in Port Coquitlam will be held on June 30, Oct. 6 and Nov. 17-18, 1973, with Scale, HLG, PennyPlane and FAI Indoor. Contact Alan Riches, 1568 Celeste Cres., Port Coquitlam, B. C. Canada for details.

NEW JERSEY - Lakehurst  
 Sport flying and Record Trials Hangar #6, July 2, 1973 unless military schedule interrupts flying. Call C. V. Russo, 201-382-0871, on previous Friday to check about site availability.

'73 NIMAS POSTAL

Name	Time	Ceiling	Fudge	Score
<u>Jr. Indoor Stick</u>				
Steve Lovins	502.8	22.5'	1.248	627.5
Robin Stocking	41.5	20'	1.323	54.9

Jr. Class II HLG

Steve Lovins	20.0	27.5'	1.273	25.5
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Sr. Easy B

Kevin Wehner	254.3	20.5'	1.312	333.6
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Sr. PennyPlane

Bruce Matthews	316.2	22.2'	1.256	397.1
Kevin Wehner	322.0	27.5'	1.229	395.7

Sr. Class I HLG

Bruce Matthews	51.2	22.0'	1.136	58.2
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Open Class I HLG

Michael Thompson	53.1	20'	1.25	66.4
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Open Indoor Stick

Howard Haupt	1074.8	75'	.683	734.1
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Open PennyPlane

Alan Riches	410.4	20.2'	1.314	539.3
Clarence Mather	377.0	22.3'	1.253	472.4
Howard Haupt	355.0	22.5'	1.248	443.0
Bud Tenny	421.3	58'	.777	327.4
Ted Katsanis	236.0	20'	1.323	312.2

Open Easy B

Hal Crane	553.0	20.1'	1.318	728.8
Clarence Mather	531.0	22.3'	1.253	715.5
Fudo Takagi	445.0	22.3'	1.253	557.6
Alan Riches	422.2	20.2'	1.314	554.8
Bob Platt	393.0	20.1'	1.318	518.0
Michael Thompson	347.0	20'	1.323	459.1
Ted Katsanis	338.0	20'	1.323	447.2

CONTEST RESULTS

Second Annual Indoor Contest, Apr. 15, 1973, Cat. II  
Univ. of Cincinnati Fieldhouse, Cincinnati OH 65' ceil.

Indoor HLG

Bucky Servaites	1:49	<u>PennyPlane</u> Tom Sovo*	9:22
Rudy Kluber	1:47	Marty Richardson	9:20
Phil Sullivan	1:45	Hank DeKat	8:58
Chuck Markos	1:44	Rol Anderson	8:52
Mark Kummerow*	1:29	Joe Sovo	8:22

Paper Stick

Chuck Markos	15:43
Bucky Servaites	13:19
Tom Sovo*	12:56
Joe Sovo	11:43
Rol Anderson	11:00

AMA Scale

Bucky Servaites	1911 Cessna	174 points
Chuck Markos	Westland Widgeon	164 points
Mark Kummerow*		161 points
Jim Bair	Impanema	131 points
Ken Johnson	Fairchild	125 points

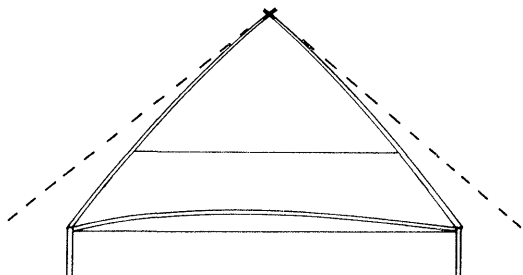
Peanut Scale

Bucky Servaites	Dayton Wright	5:54
Lou Willis	Ord Hume	5:39
Ken Johnson	Gee Bee Sportster	3:58
Jim Miller	Itch	3:36
Chuck Markos	Piper J3	2:55

\*Senior age contestants

HINTS AND KINKS

Curtis Janke suggests that a stressed cabane will be stiffer for a given weight than the conventional type. To make a stressed cabane, glue the top at a greater than normal angle (see sketch below), then pull the ends to the proper distance apart. After installation, a short piece of dacron or wire across the cabane half-way up will prevent the cabane from bowing out further under load.



MODEL CONSTRUCTION TECHNIQUES

Model Assembly Jig

One of the more important steps in building a model is assembling the motorstick to the tail boom and then mounting the tail surfaces to the boom. The fixture shown below makes such assembly easy, safe, and accurate. As an added bonus, all the fixtures pack away in a small space for field repairs. In fact, one box 17 1/2 x 11 1/2 x 3 holds the fixtures shown, plus a built-up boom fixture and a prop spar matching fixture (Slithery-Dee, July '71 MAN), a spring scale and several prop covering frames (June '70 INAV), and finally, a stick bracing fixture and a simple prop pitch gage. A complete field repair kit!

To use the fixtures, locate a flat surface about 18" long and perhaps 10" wide minimum. Tape down the fuselage support stand and tape or pin the motorstick solidly in it. Set the tail boom stand behind the stick, raised to the approximate height. Slip the tail boom and stick together, then position the tail boom stand so the boom is in exactly the planned position relative to the stick. Glue the boom to the stick and allow to dry thoroughly. Arrange the universal supports on either side of the boom, then place the stab across the boom and supports. Arrange supports to the exact height (allow for stab tilt) needed. If the stab is to have washin/washout, this can be set into the supports also. Glue the stab into place. If the stab is to be braced, add the bracing post(s) and the bracing before removing the model from the jig.

Depending upon whether the rudder is behind the stab or in front, the fin can also be assembled on the jig. If the rudder is trailing or underslung, it may be best to attach the rudder before mounting the boom to the stick. With a rudder mounting in front of the stab, mount the boom to the stick, then rotate this assembly 90° so the rudder will be horizontal. Use one or both the universal stands to support the rudder while attaching it to the boom, then rotate the assembly upright and attach the stab as before.

Finally, for field repairs or major changes (such as changing the angle between boom and stick) mount the model in the fuselage support stand and use the other fixtures as necessary to support and steady the various parts while repairs/changes are made.

STATE OF THE ART

Free Flight News is an excellent FF newsletter published monthly by Ian Kaynes, 11 Parkside Rd., Sunningdale ASCOT, Berks, England SL50NL. Thanks to Ian's hustling crew of reporters, FFN had an excellent report on the '73 WCh and then follow-up three-views of many of the top models. Two of these three-views are reproduced on page 3, and the prop/rubber combo used by Jiraski is shown on page 4. It is now 11:30 pm, and the CMOS/INF info hasn't been computed; this info will be reported in the July '73 issue so this thing can get printed tomorrow!

INDOOR ELSEWHERE

ITALY - Rome

Coppa Urbe VIII (may also have been Italian Nats) was held in the 33.5 m (109') Palazzo Dello Sport (site of '68 World Champs), with FAI and PennyPlane. The contest was held Mar. 19, 1973; the results below may be incomplete.

FAI (one gram)

A. Fricoli	Rimini	30:13	29:40	59:53
Fl. Migani	Rimini	26:51	25:17	52:08
F. Migani	Rimini	26:36	24:47	51:23
G. Masciullo	Rome	23:43	26:15	49:58
C. Cotugno	Rome	24:05	24:38	48:43
I. Federici	Rome	21:31	21:02	42:33
Martini	Rome	15:23	24:36	39:59
Saba	Rome	16:19	22:32	38:51

PennyPlane (3.2 gram)

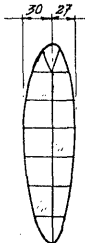
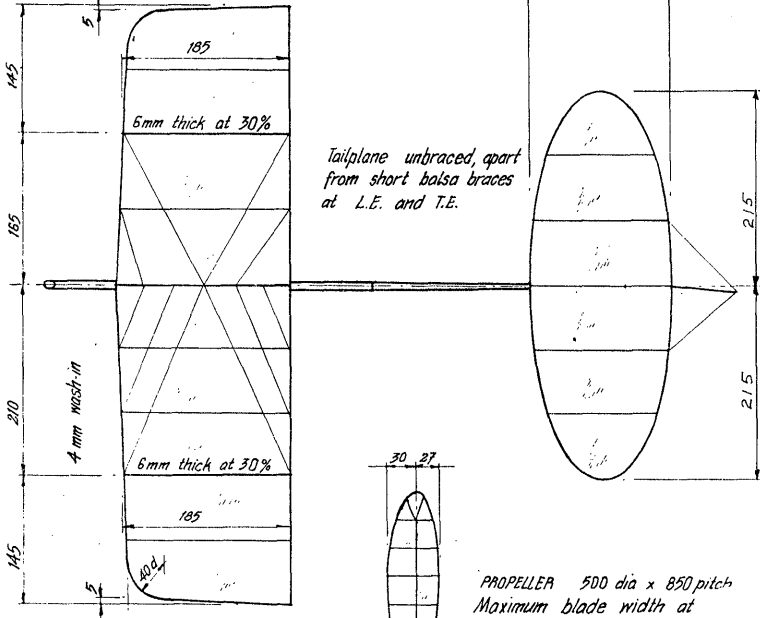
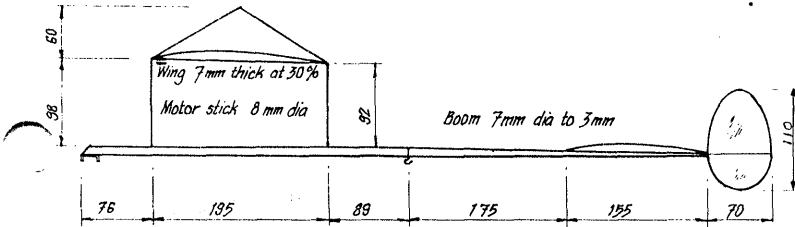
Fl. Migani	Rimini	7:37
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ARGENTINA - Buenos Aires

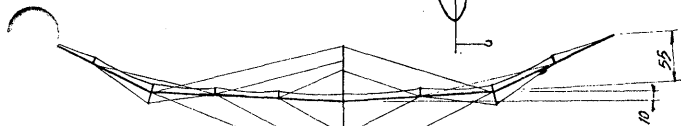
The Argentine Indoor Nats were held Apr. 20, 1973 in a site with about 10 m ceiling. Barilari's 15:32 is both an Argentine national record and a record for South America as well. The results:

Alberto Barilari	14:49	15:32	30:21
Nereo Beggato	14:50	14:52	29:42
Eduardo Grippo	13:48	14:10	27:58
Miguel Leone	10:03	14:10	24:13
Domingo Sassone	12:05	10:55	23:00
Marcos Molo	5:37	2:54	8:31

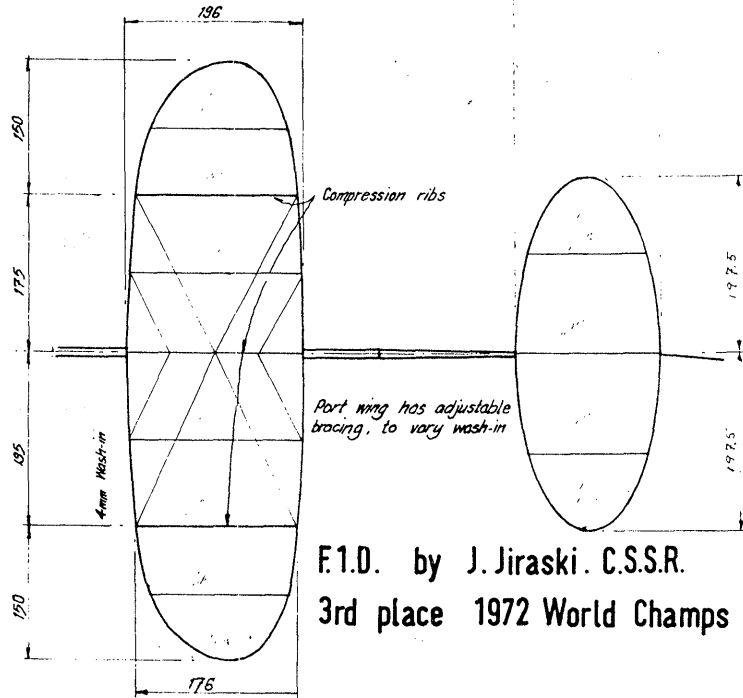
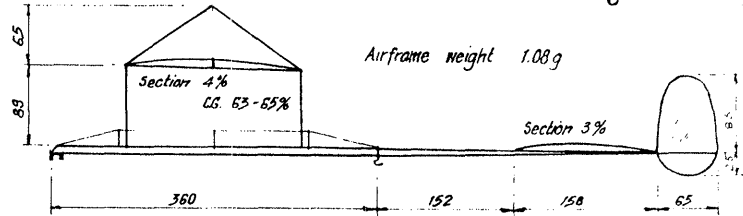
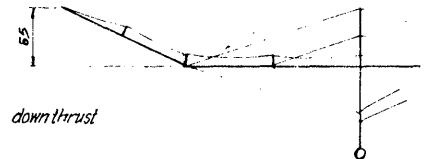
Timber sizes selected to suit weight and function from best available balsa.



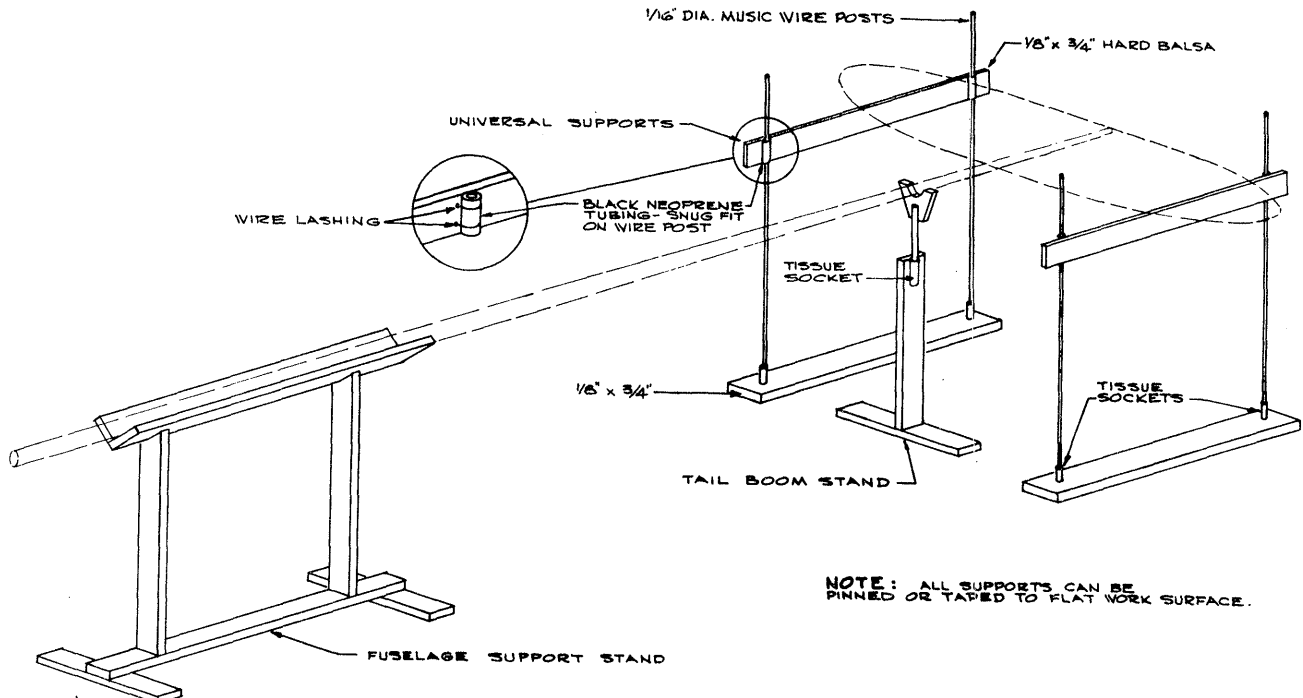
PROPELLER 30 dia x 890 pitch  
Maximum blade width at 60 to 65% R.



F.I.D. by Jiri Kalina. C.S.S.R.  
4th place 1972 World Champs

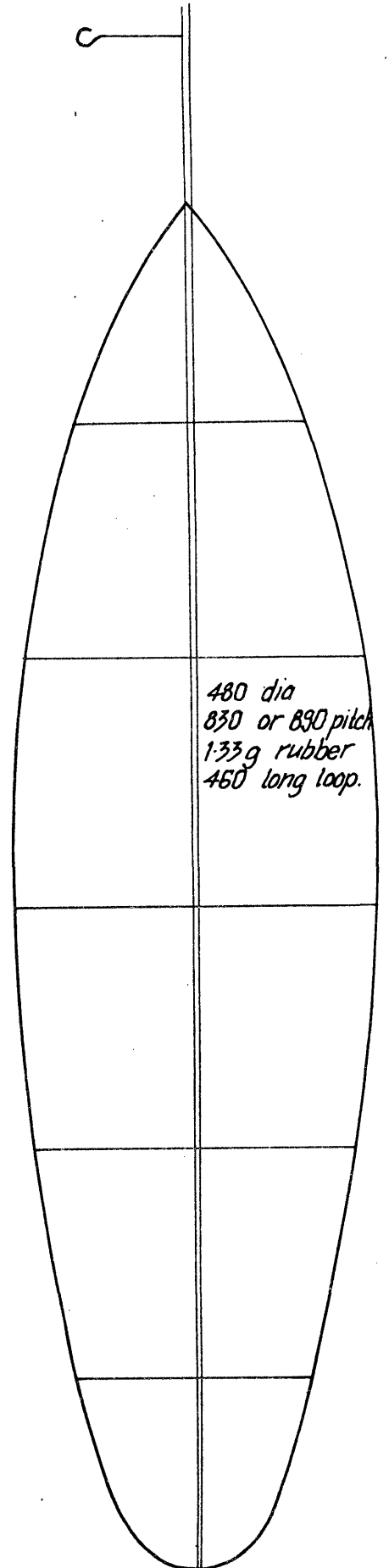
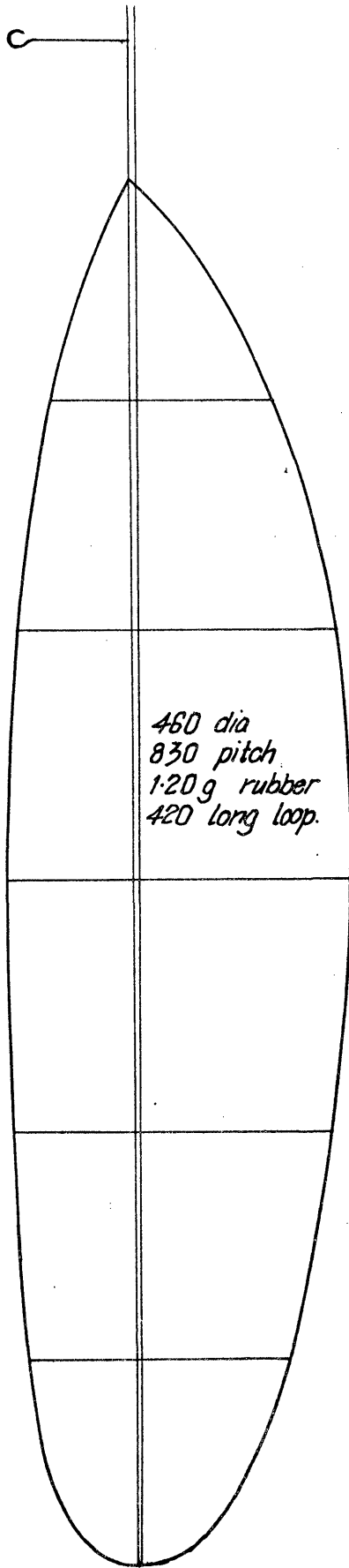
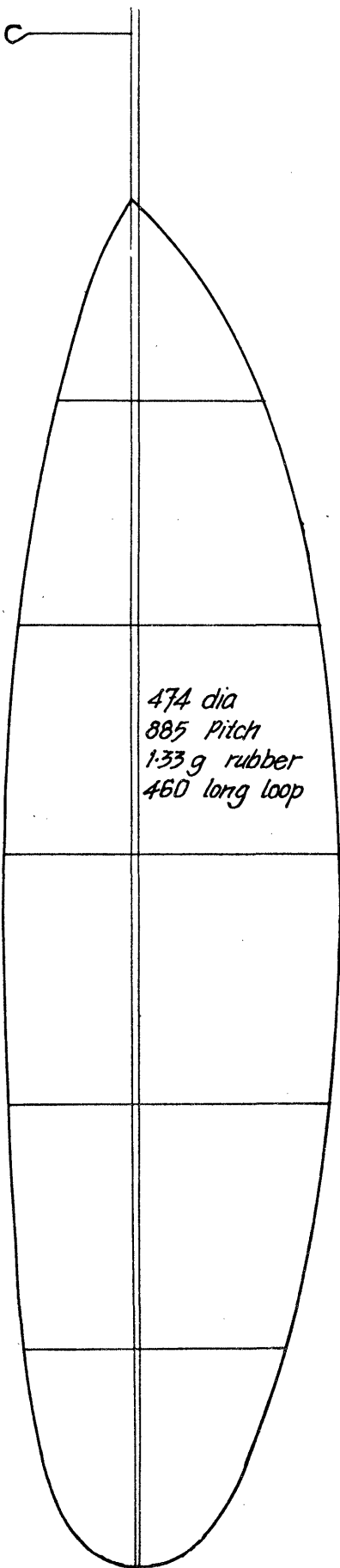


F.I.D. by J. Jiraski. C.S.S.R.  
3rd place 1972 World Champs



NOTE: ALL SUPPORTS CAN BE PINNED OR TAPED TO FLAT WORK SURFACE.

**FUSELAGE AND BOOM ASSEMBLY JIG**



Jiraski 's propeller / rubber combinations.

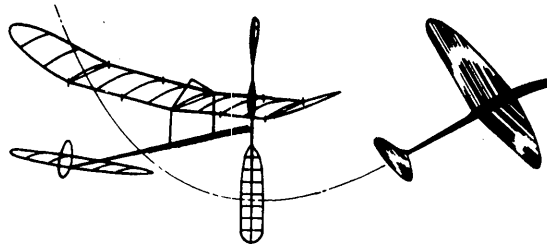
Full-size



# INDOOR

## NEWS and VIEWS

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



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

New Members!

NORMAN JACKY, 674 Sterling Dr., Fond du Lac WI 54935  
 FRANK PETRONIO, Presbyterian Rd., Albion NY 14411  
 ROBERT RODEN, 7738 N 32 Drive, Phoenix AZ 85021

Honorary Members

GIOVANNI FEDERIGI, Via F. Tacchinardi 6/8, 01168 Roma, Italy  
 FERNANDO MIGANI, Via N. Tommaseo 66, 47037 Rimini (FO) Italy

Change of Address

BILL HAUGHT, 3205 Nottingham Lane, Modesto CA 95350

Ernie Kopecky

We lost a good friend when Ernie Kopecky died on July 3, 1973. He finally succumbed to heart trouble which had plagued him repeatedly in the last few years. He was always a friend, helpful when he could be, and a hard, fair competitor. We will miss him greatly.

New Materials!

Ray Harlan, 15 Happy Hollow Rd., Wayland MA 01778, has located a source of "O" rings - 9/64" OD, 3/64" ID, with 3/64" cross section. The cost is 15¢ each, and their weight is .0038 oz. Ray will furnish these at 15¢ each in lots of one dozen or more.

Jigs And Fixtures

Indoor modelers are probably more prolific users of special jigs and fixtures than any other kind of modeler. Many of you have furnished these ideas in the past, and these devices will be featured in a future series. All who have unusual and helpful jigs and fixtures are asked to share them for this series.

Airfoils

As I geared up for the team selection program, it was necessary to make arc templates of large radius. Four curves were drawn, arranged in pairs (25"/22" and 20"/17") to make Andrews-type double-curved ribs. These curves will be copied on request (send stamped, self-addressed envelope with your request) at no charge. The % thickness of these curves according to wing chord is shown below:

Chord	25"	22"	20"	17"
6"	3%	3.4%	3.8%	4.5%
7"	3.6%	4%	4.5%	5.2%
8"	4%	4.7%	5%	6%

Special Tools?

Stan Chilton suggests that Brookstone Co, Dept. C, 12 Brookstone Bldg., Peterborough NH 03458, is a very good source of special tools for model builders. Their catalog is 63 pages of very diversified and unusual high quality tools. Send for a catalog!

FAI INDOOR REPORT

Finals Site Confirmed

The South Central Semi-Finals showed that the American Airlines Maintenance Hangar at Tulsa International Airport (holds a DC-10, a 747 and two smaller airplanes at the same time) is quite satisfactory for the Team Selection Finals. AMA HQ has announced that AMA President John Clemens has approved the site choice on the previously announced dates of Aug. 17-19, 1973. Aug. 17 (Friday) is for test flying, while three official rounds will be held on each of the two remaining days.

Qualification Trials Results

Western Semi-Finals - June 23-24, 1973, Santa Ana MCAF

No formal report has been received on this event. It is believed that Paul Allen, Larry Cailliau, Clarence Mather, Bob Randolph and Erv Rodemsky qualified. In addition, Bud Romak and Joe Bilgri are qualified as having been chosen for the 1972 Indoor Team.

South Central Semi-Finals - June 30-July 1, 1973. American Airlines hangar, 94' FAI, 108' AMA ceiling.

Stan Chilton	39:36
Paul Tryon	39:32
Bob Dunham	37:51
Ted Gonzoph	36:43
Bud Tenny	36:25
Robert Dunham II	35:24
Jim Clem	32:46
Jimmy Clem	20:03

80% of 39:36 = 31:42; 7 qualifiers

Eastern Semi-Finals - July 1, 1973, Lakehurst #5

C. V. Russo	29:21	31:46	61:07
Stan Stanwiok*	28:52	31:33	59:39
Manny Radoff**	29:57	29:42	59:39
Hal Crane	31:23	27:50	59:13
John Triolo	26:55	32:16	59:11
John Kukon	27:45	30:42	58:27
Bob Platt	25:04	29:00	54:04
Dan Domina	26:53	26:54	53:47
Tom Valles	24:43	27:04	52:36
Bill Landrum	26:01	23:20	49:21

\*Proxy flown by Pete Andrews.

\*\*Proxy flown by Bob Champine.

80% of 61:07 = 48:54; 10 qualifiers. In addition, Pete Andrews and Sal Cannizzo are qualified via membership on the 1972 Indoor Team.

RECORDS? MAYBE!

- Santa Ana Record Trials, May 27, 1973, Cat. III  
 Santa Ana MCAF, California  
 FAI Cat. IV FAI - 36:12, Bob Randolph  
 AMA Cat. III FAI - 36:12, Bob Randolph
- Cow Palace Record Trials, June 17, 1973, Cat. II AMA  
 Cow Palace, San Francisco, Cal. 98' ceiling  
 FAI Cat. III FAI - 27:09, Bud Romak  
 AMA Cat. II FAI - 27:09, Bud Romak
- South Central Team Semi-Finals, June 30/Jul. 1, 1973  
 American Airlines Hangar, Tulsa, Ok. 94' FAI Ceiling  
 \*FAI Cat. III FAI - 26:45, Stan Chilton  
 Senior Cat. III Paper Stick - 14:10, Robert Dunham III  
 Junior Cat. III Paper Stick - 10:36, Jimmy Clem  
 Junior Cat. III ROG Stick - 1:52, Jimmy Clem

- \*Stan's record attempt was made and applied for before Romak's Jun. 17 flight was made known.
- Lakehurst Record Trials, July 2, 1973, AMA Cat. III  
 Hangar #6, Lakehurst NAS, NJ. FAI Cat. IV  
 Sal Cannizzo, FAI Stick - 37:24\*\*  
 John Triolo, FAI Stick - 37:23\*\*

\*\*It is not known which flier will apply for which record; both flights qualify for both FAI Cat. IV FAI and AMA Cat. III FAI records.

TOP TEN CEILING DODGERS

Name	Time	Ceiling	Fudge	Score
1. Stan Chilton	1115	35'	1.0	1115
2. Tom Valles	810	20'	1.323	1071.6
3. Hal Crane	682	20'	1.323	902.3
4. Bud Tenny	1260	94'	.609	797.8
5. Dick Hardcastle	602	23'	1.234	742.9
6. Hewitt Phillips	528.2	20'	1.323	698.8
7. Howard Haupt	456	22'	1.261	574.5
8. Harry Cook	471	26'	1.16	546.4
9. Steve Lovens	433.2	22.5'	1.248	540.6
10. Bill Langley	421	27.5'	1.128	474.8

TOP TEN EASY B

Name	Time	Ceiling	Fudge	Score
1. Hal Crane	553.0	20.1'	1.318	728.8

2. Clarence Mather	531.0	22.3'	1.253	715.5
3. Fudo Takagi	445.0	22.3'	1.253	557.6
4. Alan Riches	422.2	20.2'	1.314	554.8
5. Bob Platt	393.0	20.1'	1.318	518.0
6. Michael Thompson	347.0	20'	1.323	459.1
7. Ted Katsanis	338.0	20'	1.323	447.2
8. Kevin Wehner	254.3	20.5'	1.312	333.6
9. *				
10. *				

\*Unlike Ceiling Dodgers, Top Ten Easy B scores are carried only until the next postal meet, when the Easy B times from the postal meet are then declared as the new Top Ten. So, "bump" into the list if you can!

INDOOR ELSEWHERE

ROMANIA - Slanic

"Indoor '73", an international indoor meet attended by fliers from 5 countries, was held in the salt mine (site of '70 WCh). Conditions were excellent, due primarily to the fact that heaters used during the '70 WCh were not used this time. With 24 flights over 30 minutes and 7 over 35, performances rivalled those of the '72 WCh at Cardington.

1. Aurel Popa	Romania I	36:16	39:16	75:32
2. E. Holtier	Romania II	37:01	37:21	74:22
3. Karol Rybecky	Czech.	37:05	35:32	72:37
4. A. Moraru	Romania I	36:07	33:38	69:45
5. Andras Ree	Hungary	33:01	34:07	67:08
6. Otto Hints	Romania II	33:31	32:49	66:20
7. Antal Egri	Hungary	32:52	33:08	66:00
8. Jiri Kalina	Czech.	33:04	32:55	65:59
9. N. Bezman	Romania I	33:25	32:24	65:49
10. John Blount	England	33:02	30:38	63:40
11. Reg Parham	England	29:02	34:00	63:02
12. R. Czechowsky	Poland	31:35	31:08	62:43
13. S. Botos	Romania II	28:59	30:39	59:38
14. Laurie Barr	England	29:24	26:33	55:57
15. A. Valenta	Czech.	26:53	27:04	53:57
16. Gy. Buzadi	Hungary	25:49	27:04	52:53
17. Stefan Bombol	Poland	24:13	24:05	48:18
18. S. Kujawa	Poland	23:57	23:24	47:21
19. Zoltan Ocsody	Hungary	20:00	01:05	21:05

Team Standings

1. Romania I	211:06
2. Romania II	200:20
3. Czechoslovakia	192:33
4. Hungary	186:01
5. England	182:39
6. Poland	158:22

POLAND - Wroclaw

An international indoor meet was held in Wroclaw on June 8-10, 1973, with the following results:

1. Jiri Kalina	Czech.	27:35	27:52	55:27
2. Edward Ciapala	Poland	28:12	26:45	54:58
3. R. Chekowski	Poland	27:49	26:45	54:01
4. S. Kujawa	Poland	24:47	28:14	53:01
5. Andras Ree	Hungary	25:39	27:14	52:53
6. V. Nikorada	Romania	25:30	26:27	51:57
7. G. Buzadi	Hungary	23:43	28:10	51:53
8. N. Bezman	Romania	28:12	22:30	50:42
9. Karol Rybecky	Czech.	23:41	26:38	50:19
10. Stefan Bombol	Poland	25:17	23:15	48:32
11. A. Valenta	Czech.	20:46	22:20	43:06
12. Zoltan Ocsody	Hungary	18:10	27:14	42:57
13. D. Frateanu	Romania	17:43	14:04	31:47
14. Z. Szymanski	Poland	13:52	12:03	25:55
15. F. Frackiewicz	Poland	6:17	13:59	20:16

Team Standings

1. Poland I	155:34
2. Czechoslovakia	153:52
3. Hungary	142:43
4. Romania	134:26
5. Poland II	101:03

STATE OF THE ART

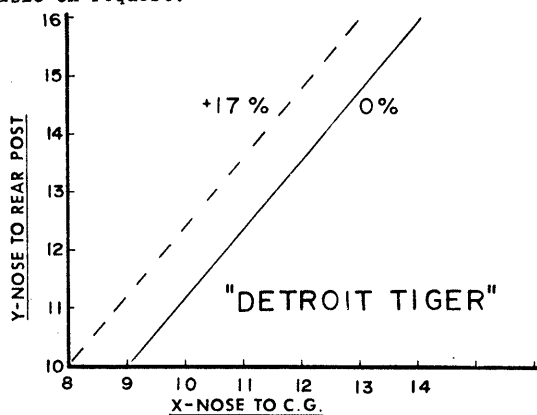
Jim Richmond's resounding come-back at Detroit (five minute margin over 2nd place) made it seem like old times. Those who observed his '73 design (Detroit Tiger) noted that the model looked the same as in earlier years. Jim made these comments on his model: "I have backed off on wing chord and have finally achieved flight characteristics similar to those of my old ('67-'70) designs. The symmetrical wing construction and the simplified stab bracing worked out OK. This method of getting wing offset works fine and doesn't produce long, unsupported spars on the left side as traditional methods do. These heavier, more powerful planes need the extra strength on the left, torque-loaded side of the wing. I think the motorstick is a bit longer than necessary. It's hard on the ulcers hooking up a motor stretched out that far! The 17½" prop was a bit on the small side, but worked out OK. It was the same type I always use."

Jim's balance point gave him +17% margin (CMOS). The INP (Mar/Apr '73 INAV) came out +22.6%, which may be somewhat misleading since the model is higher aspect ratio

than Hal designed the INP chart for.

Unfinished Business

Last month's models (Kalina and Jiraski) were set up as follows: Kalina - CMOS = +1.8%, INP = +20%; Jiraski - CMOS = +6.3%, INP = +23%. Copies of the CMOS charts are available on request.



CONTEST RESULTS

LIAMAC ANNUAL INDOOR MEET, Apr. 29, 1973, Cat. II  
Cantiague Park, Hicksville, L.I. NY 50' ceiling

<u>Jr.-Sr. HLG</u>		<u>Open HLG</u>	
Adam Minissian	74.8	Jack Minissian	84.6
Ron Stransky	73.0	Bob Nichols	84.2
Bruce Paillet	70.8	George Rivers	82.2
Barry Paillet	69.2	Al Vollmer	79.8
Joe Nuszer, Jr.	65.2	John Kaufman	78.4

<u>Jr.-Sr. Easy B</u>		<u>Open Easy B</u>	
Dan Aggers	8:02.4	Pete Andrews	10:18.4
Chris Clemens	7:49.2	Frank Haynes	8:55.0
Jerry Haynes	7:01.0	Bob Clemens	8:36.6
Larry DeCarlo	7:00.0	John Kukon	8:22.2
Adam Minissian	6:32.2	Carrol Allen	8:20.0

<u>Indoor Stick</u>		<u>Indoor Scale</u>	
Larry DeCarlo	11:29.2	Don Garofalow	120.0 pts.
Dan Domina	10:55.6	Joe Muszer	114.4
John Kukon	10:35.0	Chet Bukowski	110.8
Pete Andrews	10:15.8	Bob Hatschek	108.8
Al Vollmer	9:38.6	Bob Bender	99.5

<u>Jr.-Sr. Peanut Scale</u>		<u>Open Peanut Scale</u>	
Bruce Paillet	57.4 pts	Dan Domina	92.5 pts.
Chris Clemens	52.8	Don Garofalow	67.0
Jerry Haynes	51.6	Ed Franklin	66.0
Barry Paillet	39.6	Frank Haynes	61.6
Ron Stransky	39.5	Bob Clemens	58.9

Jr.-Sr. High Point Champion - Bruce Paillet

Open High Point Champion - Dan Domina

Meet Champion - Dan Domina

HINTS AND KINKS

Curtis Janke reports some short-cuts used by Jim Richmond:

To stabilize the slightly curved tips on his wide-wing FAI design, Jim bowed the end rib outward slightly, then ran a tension brace across the ends to hold the tip bowed.

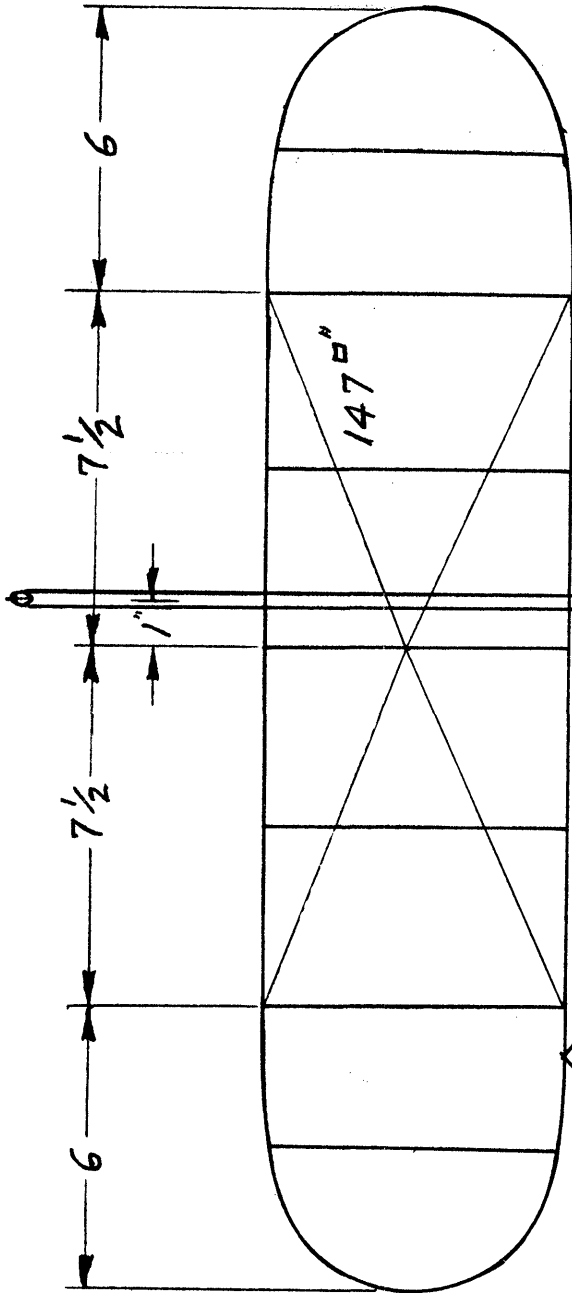
To cure warps due to film shrinkage, Jim passes a lit cigarette under the extra-tight film while warping the surface back into shape. The smoke has a sort of relaxing effect on the film, which lasts just about 30 minutes. It isn't clear why this works, but Curtis suggests that the smoke fumes force themselves into the pores of the film and expand it temporarily.

Jim uses saliva to attach his condenser paper; the moisture causes the spars to expand span-wise so that the paper and spars expand and contract together.

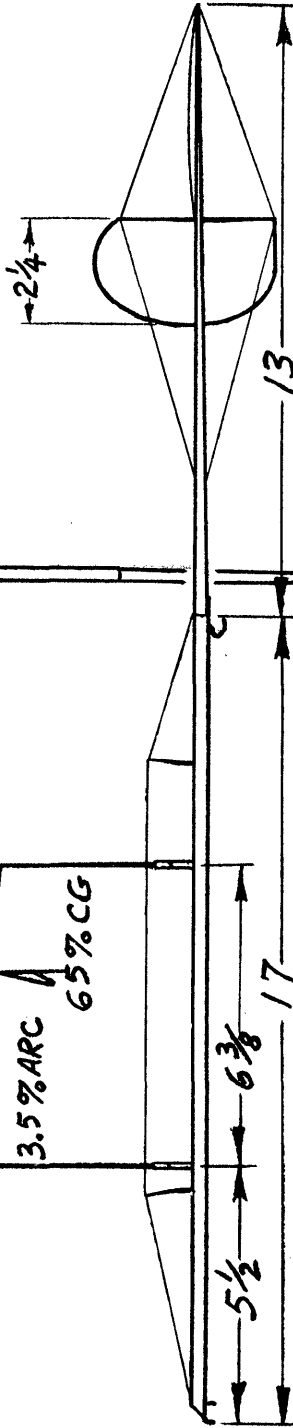
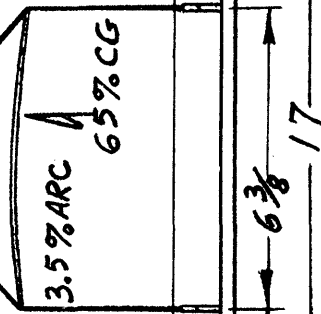
Jim uses tapered, rectangular prop spars. There are two major gains to this; the spars are stiffer for a given weight and are easier to cut and match.

A LOOK AT YESTERYEAR

Have you ever wondered why sheets of indoor wood are only about 1-1/8" wide? There may be other reasons for this particular size in modern times, but Frank Zaic relates that it all started because 1-1/8" wide sheets made exactly the right size motorstick blank for models flown by Carl Goldberg (and kitted by Frank).

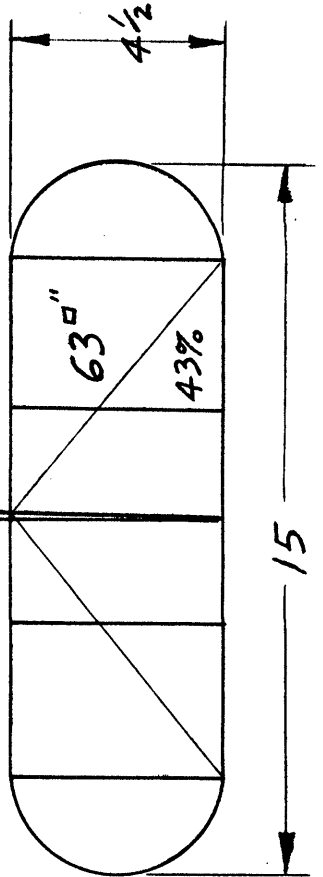
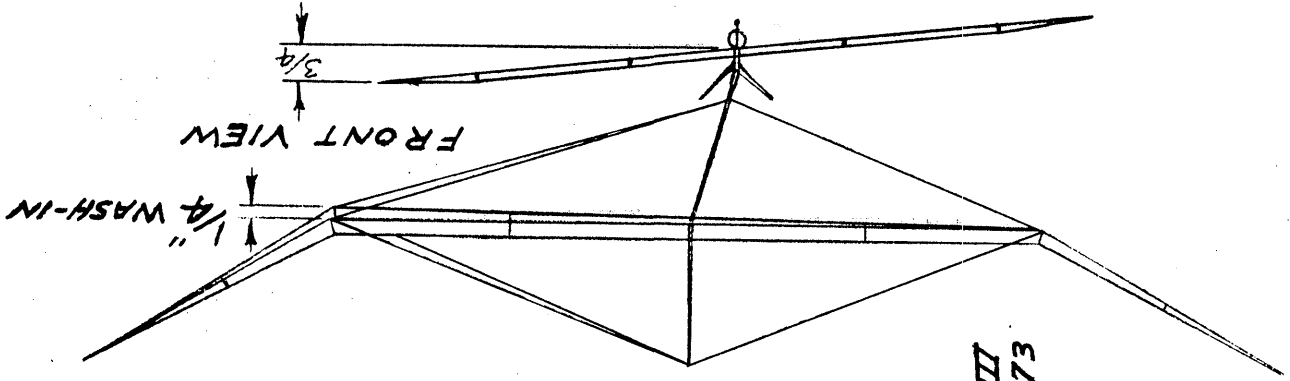


PROP  
17 1/2 x 36



	OZ.	GM.
WING	.0087	.247
STICK	.0125	.355
STAB & BM.	.0071	.200
PROP	.0048	.137
BALAST	.0022	.061
TOTAL	.0353	1.000

BEST FLIGHT - 25:20  
FAI RECORD FOR AMA CAT. II & FAI CAT. III  
65 FT. CEILING - DETROIT - 6-2-73



DETROIT TIGER - FAI-  
By Jim Richmond

## INDOOR CONSTRUCTION TECHNIQUES

### The Braced Motorstick - Part II

This discussion is continued from the May '73 INAV, which showed two-wire bracing and internal details of the motorsticks used by Al Rohrbaugh.

Fig. 1 shows a very common bracing scheme - the angled monowire. This is the easiest motorstick brace to make and "live with", in that it does not disturb the wing bracing and is mostly out of the way of handling the model without snagging the wire.

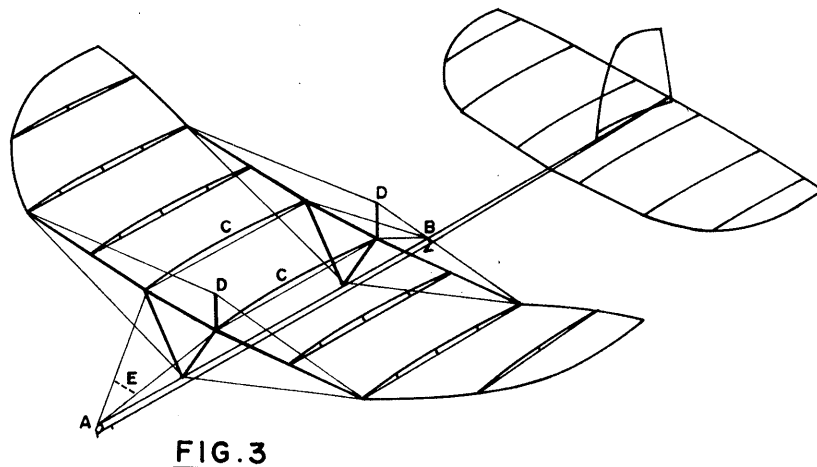
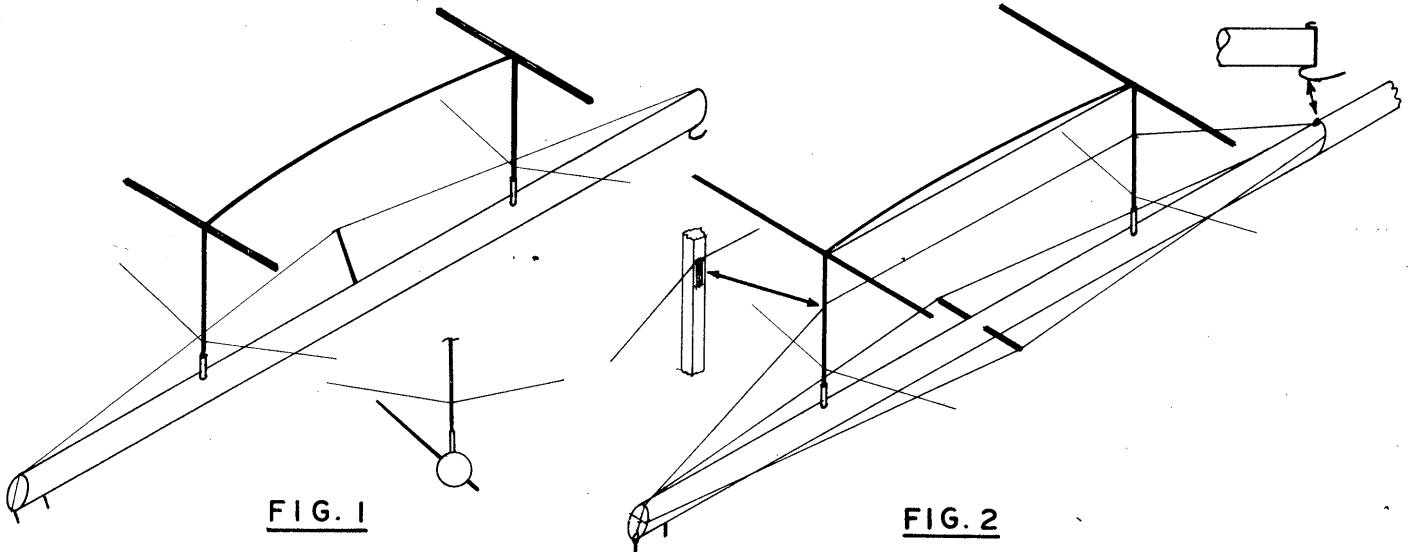
Fig. 2 shows an experimental scheme which combines the removable monowire with side brace wires. The top wire, a removable monowire, must be anchored at one end and removable at the other. If the wire is anchored at the rear hook, the prop must be removed to remove the wing, since the free end loops over the thrust bearing. With a rear hook like that shown, the prop can be assembled to the model before the wing is attached. Also, wing repair and adjustments are possible without removing the prop. Those side wires shown in Fig. 2 are a worthwhile addition, provided one can remember not to "twang" them with a wound motor on the model.

Of the four schemes discussed so far, only the angled monowire does not permit separate down thrust and side thrust adjustments. From a personal standpoint, I feel that side thrust is essential in most models to help pull the nose around in the turn during the burst. Again, from a personal standpoint, I prefer either the removable monowire or the three-wire system shown in Fig. 2. As a rule, downthrust (permanent adjustment in the bearing angle) is not critical; temporary downthrust caused by

slackening the upper monowire slightly may be very useful in controlling stalling during the burst. Because the two-wire bracing (May '73 INAV) is critical on exact balance in tension between the two wires, it is usually not feasible to adjust wire tension on the field.

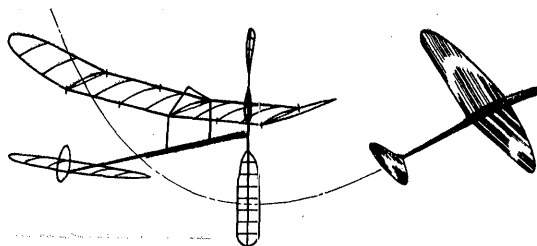
A very interesting bracing system, designed by Erv Rodemsky, is shown in Fig. 3. His wing and fuselage are braced together as a unit, with the motorstick brace wires also lending torsional resistance to the wing so that no cabane is needed. As a result, very wide wing models or models with extra-long motorsticks can be braced without a lot of extra weight. Note three characteristics of this bracing scheme: First, the brace wires must unhook at A and B. Second, although Erv uses all compression ribs at all other stations in the wing (for reliability), tension ribs are used at the two center locations (C). Finally, note that flight loads on the wing are absorbed in two short posts which are offset toward the inboard wing so as to provide added support for the longer inboard panel.

Erv cites one major disadvantage with this system - without a cabane steadying the posts, it is a bit scary to handle the wing when it is not plugged into the mount block or the fuselage! However, the wire braces are not critical on tension; in fact, he normally installs them so there is no visible slack. When the motor is hooked up, the whole model locks into a rigid structure. As for variable downthrust, this could be provided by installing the wires slightly slack and then tensioning them with a sliding loop shown as a dotted line (E).



# INDOOR

## NEWS and VIEWS



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

Indoor Stick

Paper Stick

Indoor Cabin

Indoor HLG

Junior

Junior

Junior

Junior

1. Jimmy Clem 18:21.2
2. John Magnus 17:24.0
3. William Schlarb 8:41.6
4. Robert Perkins 7:55.4
5. Mindi Linstrum 6:44.4
6. Bruce Pallet

1. Jimmy Clem 12:22.0
2. Bruce Pallet 11:06.6
3. Barry Pallet 9:58.6
4. Robert Perkins 9:53.6
5. Chris Clemens 8:49.2
6. William Schlarb 7:57.0
7. Mindi Linstrum 5:44.0
8. John Magnus 1:04.1

1. John Magnus 11:15.4
2. Tim Patterson 6:34.5
3. Barry Pallet 5:44.3
4. Bruce Pallet 5:10.8
5. Jimmy Clem 4:48.6
6. Chris Clemens 4:28.6

1. William Schlarb 104.0
2. James Bayley 87.7
3. Barry Pallet 84.1
4. Bruce Pallet 83.9
5. John Magnus 83.0
6. Douglas Marsh 82.3
7. Robert Perkins 73.0
8. Tim Patterson 71.2
9. Daniel Sargent 53.0
10. James Loribecki 44.2

Senior

Senior

Senior

Senior

1. Bill Shailor 21:10.0
2. Tom Sovo 21:00.5
3. Richard Doig 18:35.9
4. Walter Lounsbury 15:28.4
5. Keith Gordey 12:04.8
6. Scott Wisniewski 9:35.6

1. Paul Shailor 17:08.0
2. Bill Shailor 16:07.0
3. Richard Doig 15:52.5
4. Tom Sovo 11:49.0
5. Steve Oravec 10:00.2
6. Walter Lounsbury 9:53.0
7. Scott Wisniewski 8:21.1

1. Tom Sovo 15:42.2

1. Robert Hayes 123.7
2. Charles Weise 122.2
3. Paul Shailor 114.4
4. Brian Fardue 111.5
5. John Loribecki 104.0
6. Peter Lewis 102.2
7. Keith Gordey 98.7
8. Mark Kummerow 97.8
9. Richard Doig 96.2
10. Walter Lounsbury 90.8

Open

Open

Open

Open

1. Al Rohrbaugh 29:04.6
2. Charlie Sotich 25:40.2
3. Dennis Jaecks 24:43.6
4. Bob Randolph 23:50.4
5. Howard Haupt 22:51.0
6. Dick Hardcastle 20:07.4
7. Gilbert Graunke 19:09.2
8. Wayne Zink 14:12.5
9. Otto Curth 13:21.2
10. Jeff Annis 13:02.5

1. Dennis Jaecks 20:14.2
2. Al Rohrbaugh 19:15.2
3. Bob Randolph 18:32.3
4. Charlie Sotich 17:45.6
5. Rolland Anderson 17:00.4
6. Curtis Janke 16:56.0
7. Chuck Markos 16:53.2
8. Ed Stoll 16:44.3
9. Larry Cailliau 15:16.2
10. Wayne Zink 13:56.0

1. Bob Randolph 23:19.5
2. Bucky Servaites 23:15.0
3. Larry Cailliau 20:48.2
4. Al Rohrbaugh 18:30.8
5. Dennis Jaecks 16:22.0
6. Wayne Zink 16:16.0

1. Bucky Servaites 132.1
2. Robert Watson 128.6
3. Rudy Kluber 122.0
4. Phillip Sullivan 120.6
5. George Lewis 116.2
6. Larry Cailliau 115.8
7. Denny Dock 115.0
8. Dick Swenson 106.6
9. Chuck Markos 106.4
10. Dan Belleff 98.4

Indoor Scale

PennyPlane

Junior

Junior

1. Rebecca Stark 99.50
2. Barry Pallet 99.33
3. Bruce Pallet 94.67
4. Tim Noonan 67.67
5. Laurie Stark 64.0

1. Dan Brown 10:24.5
2. Bob Perkins 8:53.6
3. Mindi Linstrum 8:17.9
4. Tim Stone 7:41.5
5. Ed Kozak 5:34.1
6. Tim Noonan 5:28.4
7. Andrew Cailliau 2:42.5
8. Carl Linstrum 0:08.0

9. Al Rohrbaugh 10:25.5
10. Rol Anderson 9:43.4
11. Chuck Markos 9:34.2
12. Robert Hayes 9:13.3
13. Hank DeKat 9:12.6
14. Charlie Sotich 9:12.5
15. Rolfe Gregory\* 8:56.2
16. Jim Pulley 8:07.9
17. Otto Curth 8:00.0
18. Howard Haupt 7:25.5
19. James Jones 7:04.8
20. Gilbert Robbins 6:09.1
21. Dave Linstrum 5:46.7
22. Robert Elman 5:39.0
23. Martin Richardson 5:32.0
24. Jim Harte 4:59.1

Senior

1. Mark Kummerow 130.0
2. Scott Wisniewski 83.67
3. Jeffrey Nix 58.83
4. Bruce Bina 50.0
5. Jon Rogers 49.0
6. Michael Joerms 45.0
7. Alan Stone 20.0

1. Keith Gordey 9:53.3
2. Steve Oravec 9:17.5
3. Walter Lounsbury 9:00.0
4. Tom Sovo 8:56.4
5. Mark Kummerow 6:16.2
6. Rich Jaros 4:10.8

Senior

Open

1. Keith Ward 158.50
2. Frederick Stark 153.0
3. William Naylor 143.33
4. Ron Martlet 141.67
5. Chuck Markos 138.33
6. Bucky Servaites 136.0
7. Hal Warner 128.17
8. John Martin 126.67
9. Don Garofalo 123.17
10. Edward Fort 119.25

Open

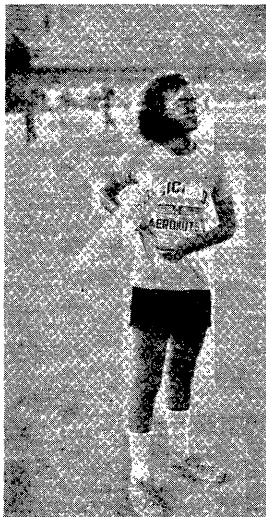
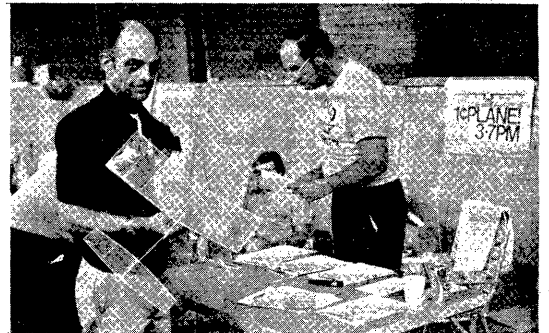
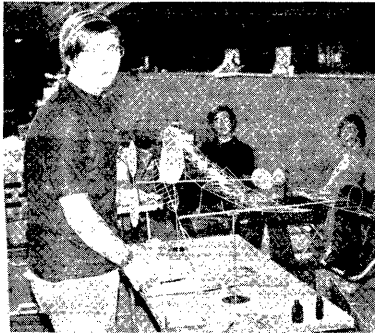
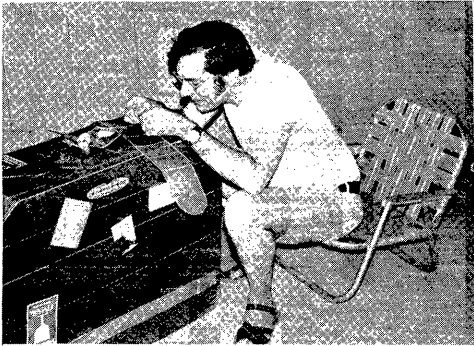
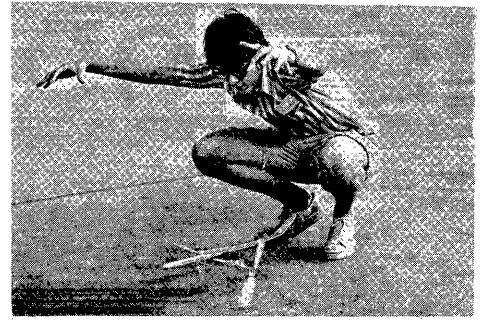
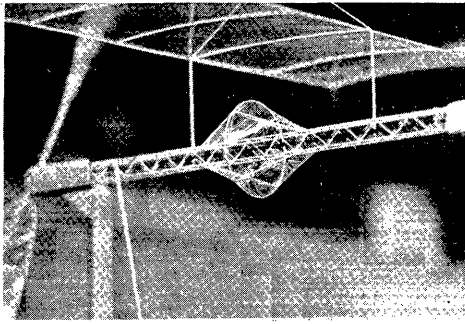
1. Dennis Jaecks 12:19.8
2. Dick Hardcastle 12:04.8
3. Gordon Wisniewski 11:52.0
4. Bob Randolph 11:45.0
5. Steve Brown 11:41.4
6. Larry Cailliau 11:26.0
7. Joe Sovo 11:01.0
8. Bud Tenny 10:44.8

'73 Nats

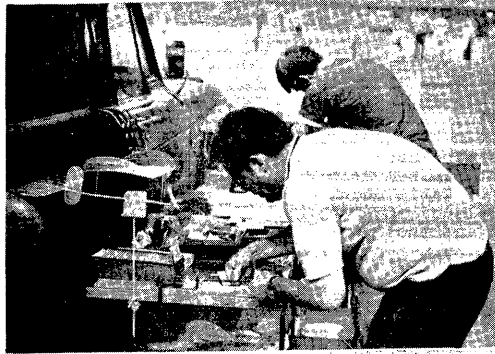
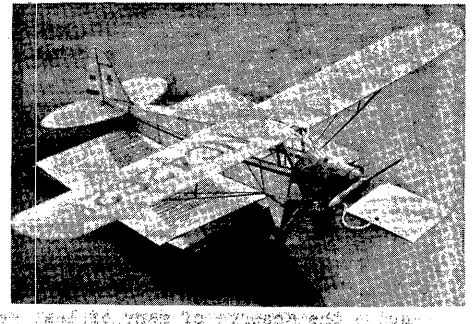
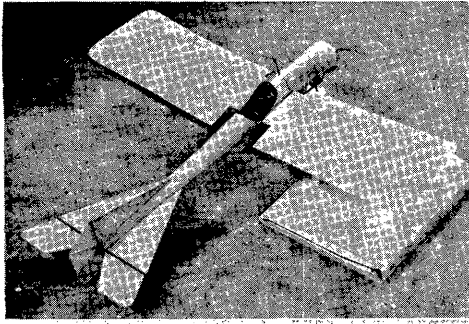
Disjointed memories of the Indoor Nats: Several "Super Sweep 22"-looking HLG's that, as a rule, didn't "tune in" in time -- better flier cooperation with the test fly/official flying periods -- a couple of well-meaning kids "retrieving" HLG's from bleacher area by grabbing models in flight -- deadly serious mein of the leaders as they ran out of flights but not determination -- the sad shrug or pleased glow as the glider rolls out perfectly or not quite -- the "just one more launch" air after official flying ceased -- quiet applause for trophy winners as official results announced and trophies passed out on-site for the first time.

Purposeful activity and feverish preparation as record number of PennyPlane entrants tried to fit five officials into four-hour period -- personal chagrin over untested P/P prop intended to replace too-small original props and not enough time to make it work -- the minor triumph of being "only" 1:35 out of 1st place, offset by sad reality of 8th place -- excellent performance by Junior & Senior P/P models -- the very real challenge to improve models and strategy between the levels of average to good.

Sad memories of unusual and random drift patterns that destroyed many Paper Stick models on the lights -- nearly







normal entry in Indoor events with many not flying -- the ghost-like and majestic flight by Rohrbaugh's high aspect ratio model -- recalls the beauty of flight of 90 cm FAI models, but more slow, steady flight -- fierce rivalry between Jimmy Clem and John Magnus -- also between Bruce and Barry Paillet -- Paul Shallor's win in Paper Stick with the model his brother encouraged him to build -- dogged persistence of Jim Richmond as he repeatedly repaired pieces of models retrieved from the lights -- the quiet competence and firm command of Bob Champine (indoor director) -- Thanks to Bob and many helpers for a good meet!

#### THE SCALE REPORT

By Dr. John Martin

Despite the absence of many of last year's scale flyers, indoor scale entries were up 20% from '72, and the quality of models was up also. 73 scale models were entered - 36 in AMA Scale, 7 in Navy Scale and 30 in Peanut Scale. I feel that the 1973 Nats had the best collection of indoor scale models ever, and that, due to the challenging rules (with the exception of Peanut), the event will continue to grow and improve the breed.

**AMA Scale** - With the exception of Ron Martelet's microlite covered Pilatus Porter (which won 1st for him three years ago), all of the entries were very realistic. The realism even extended to having the scale number of ribs, longerons, stringers and rigging wires. This was the second year of the new indoor scale rules and most scale modelers are enjoying the challenge of building a realistic model light enough to fly well. All of the top placed models managed flights over a minute despite the fact they were dripping with details and "heavy" construction. Back again are the standbys of the 1930's - the Cubs, Mono-coups, and other cabin monoplanes. Although the judging was severe, as befits a national contest, there were some very high appearance point totals. This was particularly true of Bob Meuser's magnificent Blackburn monoplane. The scale presentation alone looked like an encyclopedia with 8 1/2 x 11 glossy photos and close-up detail photos. It scored a Nats record of 92.5 points but never made an official flight. The scale turnbuckles on the left wing rigging were too tight and crumpled the wing beyond repair on one hard landing.

The winner - Keith Ward, and second place Tom Stark, flew very similar planes. 3/4" scale, built like the factory, and weighing about one ounce. Both were capable of ROG flights of well over a minute. It was a joy to see this field of realistic aircraft take off, circle and land like their counterparts.

**Navy Scale** - Only seven entries appeared in this event which commemorates 25 years of Navy sponsorship of the Nats. The Miami Indoor Club will sponsor the event again next year, as they did this year, with the hope that the entry will grow. Any AMA Scale model of any nation's navy will qualify. More advance publicity may increase this entry; the many biplanes in bright service colors make it a very interesting event. The results:

Best Junior: Mark Kummerow, Jap Jungman Biplane  
Open: 1. Lloyd Wood British Navy Stinson 114.5  
2. Ed Fort Curtis Falcon Bipe 112.17

**Peanut Scale** - Easily the fastest growing indoor sport since Monopoly, Peanut Scale has a very disturbing trend not envisioned by the authors of the current provisional rules. Peanut has become the realm of the indoor Stout Cabin competitors. The winners, wispy, see-through aircraft, are not what the Megow and Comet 10% kit crowd had in mind, in my opinion. Soap bubbles capable of three or four minute flights are winning contests and looking not at all like scale airplanes. Minus points for appearance are easily overcome by endurance points. The '72 Peanut winners are not indoor scale builders, but three of the best indoor endurance builders in the country.

This event is sponsored by the Detroit Cloudbusters, who buy the trophies out of their club treasury. These fellows deserve much more recognition than they get, since they also do all the scale judging of indoor models. They drove down from Oshkosh after rising at 5 am, stayed all day, and left for the free flight area at Oshkosh at 10 pm. These judges will remain unsung heroes until I get their names from George Lewis, their leader. Whoever they are, we thank them profusely!

This year's winning Peanut Pilot was Indoor Cabin record holder Bob Randolph, flying a 13" Nesmith Cougar. His total of 751 more than doubled the 359 point total made by Clarence Mather last year with a similar plane. Second was Bucky Servaites, flying an interesting Dayton-Wright racer with retract gear up. Third place was Dick Hardcastle with the Hannan Pilatus Porter design. The Cloudbuster Best Craftmanship Trophy was won by Henry Frautschy,

a Senior, whose Bleriot 12 got maximum scale points (20). The Bill Hannan Best Antique award went to Jim Gery for a beautiful 1927 Pietenpol. It garnered maximum appearance points and still was able to make flights of 59, 58 and 55 seconds. In my opinion, Gery's model was the best of 30 entries because it looked so well and flew almost a minute each flight.

If rules which encourage building models of the type flown by Jim Gery can be devised, more Peanut fliers will be happy. Bob Clemens submitted a rule change this year which had many improvements; it was rejected, I believe, because too much documentation was required for a "fun" event.

**Peanut Analysis** - Randolph's Nesmith Cougar made a three-flight total of 751 seconds, all hand launched. Appearance points - minus 15. Modified Mather plans, microlite covering. Tail surfaces - outline only, no internal structure. Power - 15" loop of .028 pirelli, 2000 turns. Prop - 7" dia. bent sheet, 45° pitch at tips. Weight - 1.25 grams!

The Dayton-Wright RB-1 by Bucky Servaites was condenser paper covered from Henry Struck plans. Oval fuselage section with no landing gear; scored zero appearance points. Total of 498 points with 7" dia. hand-carved prop - "The only way", according to Bucky. Structure was 1/32" sq. 4# balsa; power was 14" loop of .050 pirelli with 1600 turns. Weight - 3 grams.

Dick Hardcastle's Pilatus Porter was from Hannan plans and scored minus 6 appearance points. Covering was dyed condenser paper with details added in india ink and rub-on letters from art store. A tiny three-blade prop looked like an electric fan; sheet balsa blades would clear scale length landing gear to permit ROG flights. A 16" loop of .038 pirelli with 2080 max turns gave a 291 sec. total; one flight climbed to the 90' ceiling to delight everyone.

#### THE PICTURE STORY

Photo credits: (1) Dave Linstrum; (2) Bob Clemens

#### Page 2, Row 1

Left: Close-up of cross-section bulge of Rohrbaugh's cabin model. (2)  
Center: Jimmy Clem with paper-covered cabin model. (1)

Right: Chris Clemens launches "Easy Cabin" - Easy B wing and tail on cabin fuselage. (2)

#### Page 2, Row 2

Left: Jim Richmond, as he appeared most all day. The lights and drift were brutal! (1)  
Center: Bob Champine (1), Indoor Director, greets George Lewis, Indoor Scale Director. (1)  
Right: George Lewis confers with a Scale judge. (1)

#### Page 2, Row 3

Left: Bill Shallor, Senior Indoor Stick winner. (1)  
Center: Dick Hardcastle with tandem PennyPlane. (1)  
Right: HQ central of PennyPlane event. (1)

#### Page 2, Row 4

Three HLG fliers, (1 to r) - Mark Kummerow, Robert Hayes, Walter Lounsbury. (all 1)  
Right: Unidentified PennyPlane flier. (1)

#### Page 3, Row 1

Left: Bob Meuser's excellent Blackburn Monoplane. (2)  
Center: Bucky Servaites' 1920 Dayton-Wright racer. (2)  
Right: Scale winner - Keith Ward's J-3 Piper Cub. (2)

#### Page 3, Row 2

Left: Wayne Zink checks motor for launch. (1)  
Center: Dennis Jaecks with the PennyPlane winner. (1)  
Right: Tom Sova winds his PennyPlane. (1)



Left: Mindi Linstrum and her cabin model.(1)  
 Left Center: Karl Linstrum with Dave's Super Dart.(1)  
 Right Center: Your editor, moustache, TennyPenny.(1)  
 Right: Unidentified PennyPlane entrant.(1)

## Page 3, Row 4

Left: Bill Bigge inspects Paper Stick model.(2)  
 Center: Bob Randolph steers V-tail D Stick.(2)  
 Right: Ed Stoll prepares Paper Stick model.(2)

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

New Members!

GEORGE B. ARMSTEAD, Jr., 89 Harvest Lane, Glastonbury,  
 CT 06037  
 HANK L. DEKAT, 5656 Flanders Rd., Toledo OH 43623  
 J. R. GRANT, 4797 Parkinson Blvd., Pierrefonds,  
 Quebec, Ont. Canada  
 STEVE ORAVECZ, 4839 Janet, Sylvania OH 43560  
 WILLIS TRAPHAGEN, 61 Olde Stage Rd., Chelmsford MA 01824

Family Memberships

JOHN TRAPHAGEN, 61 Olde Stage Rd., Chelmsford MA 01824

Honorary Members

MARBER A MARTINEZ, Pernas 2490 Apt. 102, Montevideo  
 Uruguay  
 BORIS ZOUBAKIN, 65 Wecker Rd., Mt. Gravatt, Brisbane  
 Queensland, Australia

Change of Address

BOB COWLEY, 3465 W. 159th St., Cleveland OH 44111  
 MARTIN SHEPHERD, 344 Berkhamsted Rd., Chesham,  
 Buckinghamshire, England

This Issue

What's here is here - there was no more. Several reports were promised, but the scale report and two sets of photographs arrived. There is no doubt of the talent available in NIMAS - presumably everyone got caught in a time crunch similar to the one here!

The Next Issue

The Sept. '73 issue will follow this one in short order, now that a late Nats, followed by FAI Finals and my annual responsibility for a Class AAA Labor Day meet are past. However: **\*SHEEP\***! Very few photos of the Finals are available here, but there were several cameras in use at the Finals. Does anyone care to share? How about a deadline of 10 days after you receive this issue? Send black and white photos to Box 545, Richardson TX 75080!

The Team

The Finals winners were: Cailliau - 30:35 + 28:34;  
 Stoll - 30:06 + 28:37; Servaites - 30:28 + 27:54. 23 entrants participated, and conditions were good enough for 19 flights to exceed 27 minutes. Complete results in the Sept. '73 issue.

Thanks To American Airlines

Those fliers who wish to thank American Airlines for their excellent cooperation during the South Central Semi and the Finals should address these letters to:

Mr. Dick Tyler, Public Relations  
 American Airlines  
 3800 North Mingo Rd.  
 Tulsa, Oklahoma

It should be noted that this is, to my knowledge, the very first example of major U.S. industrial assistance to, and acknowledgement of, formal model aviation in the U.S. In a very real sense we can claim to be a part of modeling history.

FAI Benefit Contests

In the Dec. '68 INAV, then Team Selection Chairman Clarence Mather conceived the idea of "team benefit" contests or events. The idea was to hold special events at regular indoor meets (or special meets); prizes were to be nominal in value so that entry fees could be donated to the Indoor Inboard Travel Fund. This fund defrays team travel expenses between home and the point of debarkation as the team members assemble to go to the WCh. Such an effort to boost the travel fund would only indirectly benefit the Team effort at this time, since the current fund balance at this time is probably sufficient to send two teams. Rather, perhaps we could boost the fund to a level such that some degree of travel expense reimbursement could be made to indoor Finalists traveling a long distance to Finals. Can INAV readers please share their views (postcard to INAV) on the issue of travel help?

FAI Challenges

Bill Shallor, one of a fine crop of younger fliers now breaking into FAI, asks for INAV reader reactions to this proposal: "Since indoor activity is almost nil, particularly in the FAI class, how about having an FAI meet of some magnitude to spur interest? It would have to be held in a large building to handle the models and to avoid overcrowding. We could even institute team competition with three-man teams, along with individual competition. I feel this would spark interest in FAI and create more activity. This can also raise the level of U.S. competition and give us better teams."

Ed. comment: Bill's idea parallels and supplements thoughts I've had. Perhaps this movement could begin with team and individual challenges on the local level - like inter- and intra-state challenges. For example, Jim Clem, Jimmy Clem and Bud Tenny challenge fliers in the Texas-Oklahoma area to face-to-face FAI competition at a time and place to be mutually decided. Who is game?

TOP TEN CEILING DODGERS

Name	Time	Ceiling	Fudge	Score
1. Stan Chilton	1115	35'	1.0	1115
2. Tom Vallee	810	20'	1.323	1071.6
3. Robert Dunham II**	1454	89'	.627	911.7
4. Hal Crane	682	20'	1.323	902.3
5. Bob Dunham**	1357	89'	.627	850.8
6. Bud Tenny	1275*	89'*	.627*	799.4*
7. Dick Hardcastle	602	23'	1.234	742.9
8. Hewitt Phillips	528.2	20'	1.323	698.8
9. Howard Haupt	456	22'	1.261	574.5
10. Steve Lovens	433.2	20.5'*	1.307*	566.2*

\*Entry corrected from last listing. \*\*New listing

TOP TEN EASY B

Name	Time	Ceiling	Fudge	Score
1. Hal Crane	553.1	20.1'	1.318	728.8
2. Clarence Mather	531.0	22.3'	1.253	715.5
3. Fudo Takagi	445.0	22.3'	1.253	557.6
4. Alan Riches	422.2	20.2'	1.314	554.8
5. Kevin Wehner	414.3	20.5'*	1.307*	566.2*
6. Bob Platt	393.0	20.1'	1.318	518.0
7. Michael Thompson	347.0	20'	1.323	459.1
8. Ted Katsanis	338.0	20'	1.323	447.2
9. Bob Leishman	297.0	18'	1.394	414.0
10. Open				

\*Entry corrected from last listing. \*\*New listing.

CONTEST CALENDARCONNECTICUT - Glastonbury

The Glastonbury Modelers are holding indoor sessions with their club meetings on Oct. 4, Nov. 8, Dec. 6, 1973 from 7 pm to 9:30 pm at the Glastonbury High Gym. Contest at same site Nov. 18, 1973 8 am to 5 pm. Contact George Armstead, 89 Harvest Lane, Glastonbury CT 06033.

FLORIDA - Miami

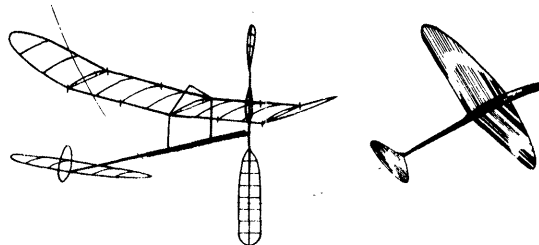
Arrangements under way to begin indoor sessions in Miami. Contact Dr. John Martin, 3227 Darwin St., Miami FL 33133 for details.

NEW JERSEY - Union

Indoor sessions at Livingston School on Midland Ave., Union NJ, 7 pm to 10 pm, Oct. 11, Nov. 8, Dec. 13, 1973. Contact Dan Domina, 1229 S. Long Ave., Hillside NJ 07205.

# INDOOR

## NEWS and VIEWS



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

1. Larry Cailliau	25:49	<u>28:34</u>	<u>30:35</u>	20:15	26:00	28:32	59:09
2. Ed Stoll	19:23	27:27	<u>30:06</u>	22:40	26:22	<u>28:37</u>	58:43
3. Bucky Servaites	15:27	<u>27:54</u>	<u>30:28</u>	26:12	8:25	16:48	58:22
4. Dick Kowalski	25:32	27:14	6:45	25:22	<u>28:48</u>	<u>28:54</u>	57:42
5. Clarence Mather	23:08	25:38	23:36	<u>27:06</u>	25:41	<u>30:09</u>	57:15
6. Paul Tryon	17:50	23:00	<u>28:39</u>	19:41	<u>27:37</u>	8:53	56:16
7. Bud Romak	21:18	20:02	24:40	<u>27:51</u>	<u>28:21</u>	4:50	56:12
8. Jim Richmond	26:01	<u>27:46</u>	5:23	<u>27:26</u>	5:33	26:24	55:12
9. Hal Crane	19:40	21:17	<u>26:42</u>	23:56	<u>26:49</u>	7:04	53:31
10. Stan Chilton	20:48	<u>24:18</u>	<u>28:56</u>	23:49	21:45	22:20	53:14
11. Erv Rodemsky	24:09	<u>27:11</u>	14:27	24:47	<u>25:58</u>	6:59	53:09
12. Al Rehrrbaugh	22:10	6:32	<u>27:12</u>	15:09	<u>25:51</u>	5:23	53:03
13. Paul Allen	<u>25:41</u>	6:40	7:10	25:17	5:01	<u>26:16</u>	51:57
14. Bob Dunham	21:24	<u>25:10</u>	<u>25:05</u>	19:25	18:54	22:37	50:15
15. Bill Hulbert	20:24	<u>25:49</u>	13:32	22:10	9:45	<u>24:01</u>	49:50
16. Joe Bilgri	20:35	15:08	<u>22:10</u>	21:19	<u>25:32</u>	2:55	47:42
17. Bob Gibbs	<u>24:30</u>	0:24	21:12	<u>22:38</u>	0:21	17:01	47:08
18. Jim Clem	21:52	<u>22:21</u>	21:28	15:44	22:07	<u>24:22</u>	46:43
19. Ron Plotzke	<u>22:42</u>	<u>23:25</u>	3:24	21:54	4:40	-	46:07
20. Bob Randolph	0:07	<u>20:51</u>	0:07	5:07	<u>25:13</u>	4:05	45:04
21. Bud Tenny	19:24	21:34	22:03	17:13	<u>23:06</u>	<u>22:13</u>	45:18
22. Ted Gonzoph	<u>21:27</u>	<u>22:56</u>	5:56	0:51	-	-	44:23
23. R. J. Dunham II	17:12	16:27	0:10	<u>18:35</u>	0:14	24:14	42:49

### THE TEAM FINALS

The 1973 Indoor Team Finals began with a meeting held by Mr. Dick Tyler of American Airlines. Mr. Tyler welcomed the entrants and meet officials, then explained the safety precautions and other matters regarding our use of a working hangar. It was apparent that American Airlines had made thorough preparations and plans for our arrival, and that American employees would have to forego comfortable working conditions in the hangar during our stay. We owe much to these people for allowing us to fly there.

The Friday evening practice session gave everyone a basic feel for the hangar even though no one really pushed hard on their practice flights. It was apparent that the workstands would interfere if drift got really bad, but these stands had bright lights at ground level which made model handling, adjustment and repair very easy. It is difficult to realize the total enclosed space of this hangar until one notices that it will hold one 747, one DC-10 (nose-to-nose, lengthwise), with plenty of room to bring in a 707 at right angles, then two 737's in the corners - all with the doors closed!

The major contest area was quite large, with two small areas at the ends of the hangar where test flying was permitted during the contest rounds. Even during the time when the DC-10 was in on Sunday, there was still room next to the DC-10's tail section for test flying of a limited sort.

Early morning conditions, before the air got really warm, were not buoyant enough to help the models any. By the 11 am starting time for Rounds 1 and 4, the air had warmed some, but most of the longer flights came in #3, #5 and #6. It has been said that "if you were ready in #3, it was hard to do better in any other round"; perhaps this impression comes from the fact that the Round 3 stan-

dings were almost identical to Round 6. However, a study of the results shows that several fliers made significant gains in #5 and #6, so it's hard to downgrade the last two rounds each day.

In general, after the air got warm, the hangar side also got warm enough to cause a circulatory pattern across the hangar. At the girder level, models moved east to near the wall, then back across the workstands again to land in the launch area. A few flights landed near the east wall or on stands, but more models made it to the floor.

Rafterbanging was the order of the day, for those who did well. This was the only aspect of the meet which left an odd feeling - luck in ceiling contacts played some part in the final outcome. However, only those who really hit hard got into trouble, and those who were able to set up a controlled climb pattern had the edge.

Those who chose the hangar originally had one worry - what would happen if an airplane had to be brought in during the contest? Their worst fears were realized as American officials announced it would be necessary to bring in a DC-10 for engine change at the end of Round 4. Careful coordination of models and the airline workers resulted in a ten-minute door opening and slight loss of flying area. Within 20 minutes, test flying was safe, and official flying resumed within an hour. So, from the score sheet, it appears as if only minor changes in conditions resulted, and the building is so airtight that it settled down quickly. Besides, what other Finals can boast of guided tours of one of the most modern airliners in the world?

In summary, it was a good meet, with conditions and

flying space quite similar to many places where a World Champs might be held in Europe. The aspect of needing a controlled climb is particularly pertinent for all sites on the European continent except Cardington and the salt mine. It is interesting to note that the times did not exceed top one gram times in the Debrecen site ('66 WCh site) which is just 10' higher and essentially not suitable for any ceiling contact. As will be reported in a future issue, Edward Ciapala logged a 33:44 in this difficult site which is only 93' high in the center of an arch. In comparison, the Tulsa site is 89' to the bottom of the girders, with girder spacing very suitable for repeated contacts at a slow climb rate.

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

##### New Members!

JERRY BARNETTE, 4 Jefferson St., Fredericksburg VA 22401  
TOM IOERGER, 41 Atlantic St., Winthrop MA 02152  
WILLIAM C. OSBORNE, 2815 Fillmore St., Davenport IA 52804

##### Symposium Report

The 1973 NFFS Symposium Report is available for \$4.50 (members of AMA and NFFS), or for \$5.50 to others. Send a check payable to NFFS to NFFS Plans & Publications, P O Box 322, Dallas OR 97338. Include 50% postage and handling for 4th class mail.

##### FAI Challenges

In the Aug. '73 INAV, Bud Tenny, Jim Clem and Jimmy Clem issued a challenge to any teams in the Texas-Oklahoma area for competition in FAI Indoor. In response, Stan Chilton offered to team up with Bob and Bobby Dunham to compete with any Texas teams. The battle of the century - Tenny + Clem<sup>2</sup> vs. Chilton + Dunham<sup>2</sup>!

##### Team Challenge Meet

Bob Dunham has offered to host a Team Challenge Meet, with prizes of \$100, \$50 and \$25. Entry fee to be \$15 per team, with a minimum entry of six teams. If anyone is interested, drop Bob a line at P O Box 7151, Tulsa OK 74105.

##### Jigs And Fixtures

This is a reminder - as soon as it is possible to work up the necessary sketches, a series of articles will begin on jigs and fixtures. Anyone who wishes to contribute any ideas to the series should send sketches and description to Box 545, Richardson TX 75080.

##### PennyPlane Special

A future issue will be devoted to PennyPlanes, with three-vi ws, hints and all helpful information it is possible to obtain. PennyPlane Champs, Arise! Send us your winning techniques and plans!

##### Harlan Scale

We have on hand an article by Ray Harlan telling how to design and build an indoor scale; it will be printed as soon as room is available. Meanwhile, Ray is making and selling indoor scales in two models; .05 oz full scale and 1.4 grams full scale. The ounce scale has a minor scale division of .0002 oz, while the metric scale has minor division of .005 g. The scales are set to about .1" deflection for .0001 oz unbalance and have a magnetic damper to make the beam settle quickly. Price for one scale is \$20, and an extra beam (from companion model) is \$12 extra. Contact Ray at 15 Happy Hollow Rd., Wayland MA 01778, ph. 617-358-4013.

##### Executive Council Action

The 1973 Nats meeting of the AMA Executive Council finally produced a result which may eventually result in proper guidelines being established with regard to FAI Team Selection programs. Frank Ehling, Technical Director of AMA, was appointed as "czar" of FAI programs. It is not clear exactly what this entails, and Frank has requested immediate clarification from the Council.

Background - The 1971 Indoor Team Selection Program was marred by disagreements and misunderstandings which led AMA HQ to rather ineptly intervene, citing authority which has never been substantiated or documented. Eventually, matters reached crisis proportions and AMA presidential intervention was necessary to salvage the program. The Sept. '71 INAV requested clarification of a number of matters crucially important to FAI programs in general. In addition, AMA members from Districts VIII, IX and X requested Executive Council action on a similar list of concerns. The Feb. '72 Executive Council meeting considered the matter briefly and tabled it after mention was made of a document "at the printers" which answered all

the questions. This document was subsequently published without Executive Council review, and totally failed to address any of the questions. Further Council action was nil until the Feb. '73 Council meeting, when a special committee was appointed to study the problem. This committee failed to report at the Nats Council meeting, and only the insistence of Murry Frank (Dist. VIII) kept the matter open until Ehling's appointment was made.

##### What Follows PennyPlane?

Several CD's who have managed to build up indoor activity with PennyPlane, Easy B and HLG have asked what event would be good to allow indoor beginners to advance from PennyPlane. Just a thought - but how about no-weight limit PennyPlane? The basic idea would be to keep all the existing PennyPlane rules except one penny (3 grams) minimum weight. For those PennyPlane purists who might be horrified at eliminating the weight requirement altogether, keep the weight at one gram minimum. Thus, FAI one gram scales can be used for processing.

Remember, the question is: "What kind of model will allow PennyPlane fliers to learn more about indoor?" So, by using lighter versions of their same model designs, the fliers learn to build and handle lighter models. They can then go directly to AMA and FAI events. CAUTION!! It will be important to separate novices and experienced fliers by holding separate events. This is true in any competitive event which is supposed to aid beginners.

##### Photo Correction

Of the photos (Aug. '73 INAV) credited to Bob Clemens, only the scale shots and the one of Chris Clemens were taken by Bob. The rest were taken by Chris - then developed and printed by Bob. Thanks to both of you!

##### Nats Scale Officials

Bob Clemens sent the names of the scale judges for the Nats Scale, Peanut and Navy Scale events. The judges were Bob Mosher, Chuck Schobloher and Fred Wunsche. George Lewis was Scale Director, Ralph Kuenz was Ass't Director, while Scott Matteson, Pete Lewis, Andy McIsaac, Jack Russ, David Gloff and Chuck Weise. The Indoor Scale event is a complicated, detailed event which requires a high degree of dedication and perseverance. This same crew has done an outstanding job each year, and are responsible for the high degree of success Indoor Scale has enjoyed.

##### THE PICTURE STORY

All the photos shown were taken by Dick Ganslen except as noted below. It is expected that several color slides will be available for those who would like to borrow them, but the service of making black-and-white photos from color slides was not available except at expensive custom prices.

##### Row 1

Left - Ron Plotzke with the only V-dihedral design at Finals.  
Center - Dick Kowalski retrieves model after flight.  
Right - Bob Randolph prepares a biplane - note the narrow gap between wings.

##### Row 2

Left - Erv Rodemsky checks torque before flight.

Center - Jim Richmond with narrow-chord FAI (photo taken at Nats). (Servaites photo)

Right - Al Rohrbaugh (front) and Joe Bilgri rest and watch the action.

##### Row 3

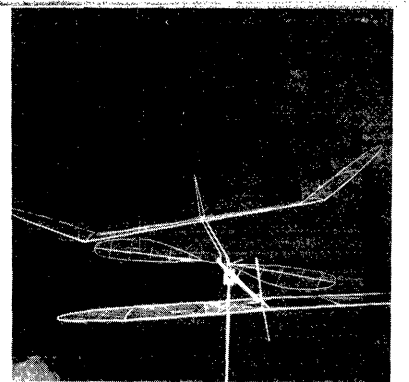
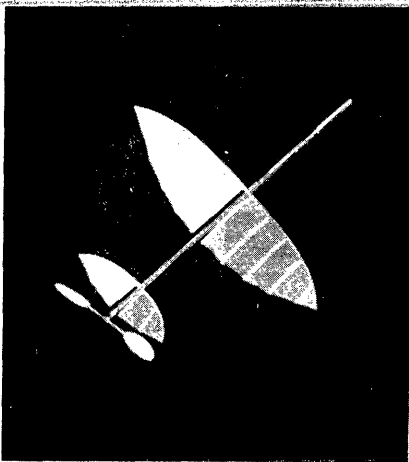
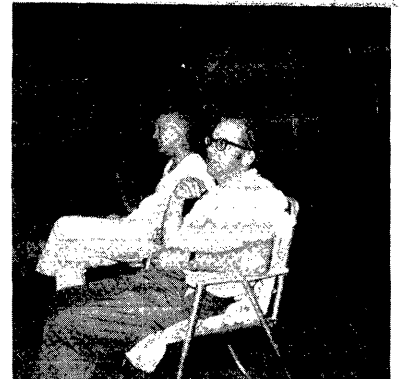
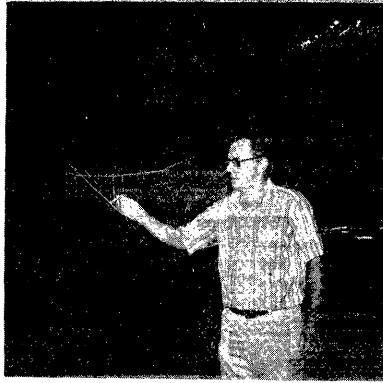
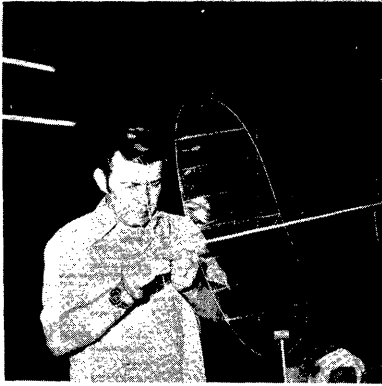
Left - Larry Cailliau retrieves winning model.

Center - Gunter Maibaum photo (see "A Look At Yesterday" elsewhere in issue).

Right - Rear view of Richmond's angled wing post feature (three-view of narrow chord model Jul. '73 INAV).

##### A LOOK AT YESTERYEAR

The Apr. '69 INAV mentioned Alphonse Penaud as being probably the first indoor flier. Gunter Maibaum built a replica of Penaud's model, using the same size, construction and weight, but with slightly lower rubber weight. He flew the model at the German Nats, held in Westfallenhalle at Dortmund. The center photo on the photo page shows the model in flight. It consistently flies for over 2 minutes on pirelli, which shows how much better pirelli is than the rubber available to Penaud. Gunter says that the model is difficult to fly under full power, and that the experience has given him great respect for Penaud's accomplishments without pirelli and without modern indoor flying knowledge.



**CONTEST CALENDAR**

**CALIFORNIA - Santa Ana**

Indoor flying sessions for regular indoor events at Santa Ana MCAF on Oct. 20-21, Nov. 24-25 and Dec. 22-23; Indoor Scale on Nov. 4, 1973. Contact Bob Randolph, 25145 Lawton Ave., Loma Linda CA 92354.

**CONNECTICUT - Glastonbury**

The Glastonbury Modelers are holding indoor sessions with their club meetings on Nov. 8 and Dec. 6, 1973 from 7 pm to 9:30 pm at the Glastonbury High Gym. Contest at the same site Nov. 18, 1973, 8 am to 5 pm. Contact George Armstead, 89 Harvest Lane, Glastonbury CT 06033.

**FLORIDA - Miami**

Indoor sessions to begin again in Miami. Contact Dr. John Martin, 3227 Darwin St., Miami FL 33133 for info.

**MASSACHUSETTS - M.I.T.**

Indoor sessions at DuPont Gymnasium, Vassar St. and Mass. Ave., Cambridge MA (use Vassar St. Entrance), on Oct. 13, Nov. 3, Dec. 1, 1973 and Jan. 12, Feb. 9, Mar. 9, and Apr. 6, 1974, 3 pm to 6 pm. Indoor contest May 4, 1974, 10 am to 7 pm; Indoor Stick, PennyPlane, HLG, Delta Dart, Indoor Scale and Peanut Scale. Ray Harlan, 15 Happy Hollow Rd., Wayland MA 01778, ph. 617-358-4013.

**NEW JERSEY - Union**

Indoor sessions at Livingston School on Midland Ave., Union NJ. 7 pm to 10 pm, Oct. 11, Nov. 8, Dec. 13, 1973, and Jan. 10, Feb. 14, Mar. 14, Apr. 4 and May 9, 1974. Sponsored by Union Model Airplane Club; contact Dan Domina at 1229 S. Long Ave., Hillside NJ 07205.

**CONTEST RESULTS**

CHICAGO AERONUTS INDOOR CONTEST, Apr. 28-29, 1973 Cat. II Madison St. Armory, Chicago, Ill. 65' ceiling

<u>Jr. PennyPlane</u>		<u>Open PennyPlane</u>	
Bill Black	5:56.2	Dennis Jaecks	10:53.5
Mindi Linstrum	4:05.6	Rol Anderson	10:18.5
Jenny Linstrum	3:41.0	Charlie Sotich	10:15.8
		Dick Hardcastle	9:45.8
		Steve Brown	9:39.1
		Hank DeKat	9:15.2
<u>Sr. PennyPlane</u>		Bob Hayes*	8:37.8
Keith Gordey	8:37.8	Chuck Markos	8:35.0
Mark Kummerow	7:56.3	Dave Linstrum	8:17.4
Eric Miller	7:55.4	Bob Elman	5:19.6
Steve Oravec	6:38.5		

<u>Paper Stick</u>		<u>Indoor Stick</u>	
Dennis Jaecks	16:17.4	Charlie Sotich	23:55.9
Charlie Sotich	14:50.6	Dennis Jaecks	21:49.8
Rol Anderson	14:30.0	Gil Graunke	18:27.0
Jeff Annis	14:09.2	Howard Haupt	17:54.8
Dick Hardcastle	13:17.2	Dick Hardcastle	15:13.6
Chuck Markos	12:30.5	Jeff Annis	14:59.1
Richard Doig	12:11.0	Clarence Mills	13:02.0
Keith Gordey*	11:31.0	Mindi Linstrum**	7:52.8
Clarence Mills	8:41.0	Dave Linstrum	4:20.0
Steve Oravec*	8:07.0	Bob Hayes*	3:08.0

<u>Jr. Paper Stick</u>		<u>Open HLG</u>	
Bill Black	3:56.5	Bob Watson	115.6
		Keith Gordey*	109.3
		Dick Swenson	107.2
<u>Jr. HLG</u>		Chuck Markos	106.4
James Loribiecki	48.4	Tom Neumann	105.2
Jim McCarthy	16.5	Richard Doig	102.2
		Bob Hayes**	98.3
		John Loribiecki	97.2
		Chris Matsuno	88.0
		Dan Neumann	68.5

<u>Indoor Scale</u>		
Keith Ward	Piper Cub	174.4 points
Chuck Markos	Westland Widgeon	168.0
Mark Kummerow	1911 Cessna	160.0
Charlie Sotich	Volksplane	132.0
Bill Naylor	Pietenpol Aircamper	130.7
Ed Fort	Vought VE-7	116.4
Charlie Sotich	Filatus Porter	116.0
Phil Cox	Filatus Turboporter	84.8
Howard Haupt	Filatus Porter	74.0
Bill Gough	Nesmith Cougar	68.0

**INDOOR ELSEWHERE**

**ENGLAND**

The second trials for the English Indoor Team was held at Cardington on Aug. 19, 1973. The team was selected on the basis of the best two-flight total from either meeting, with the final selection being Laurie Barr, Reg Parham and John Blount. The first trial results:

1. Laurie Barr	33:25	28:57	30:57	64:22
2. Reg Parham	18:18	25:47	27:11	52:58
3. Marty Shepherd	25:33	25:17	21:00	50:50
4. P. Masterman	24:58*	21:45		46:03
5. B. Hadland	23:01*	15:34	16:15	39:16
6. T. Taylor	22:11*	13:15		35:26

**Second Trials**

1. Laurie Barr	34:19	34:50		69:09
2. John Blount	29:34	29:41		59:15
3. Reg Parham	31:29	27:44	26:30	59:13
4. Marty Shepherd	28:38	20:30	29:46	58:24
5. P. Masterman	18:45	23:23	22:46	46:21
6. T. Taylor	16:48	18:31	23:56	46:07
7. B. Hadland			(did not attend 2nd trials)	39:16

**GERMANY**

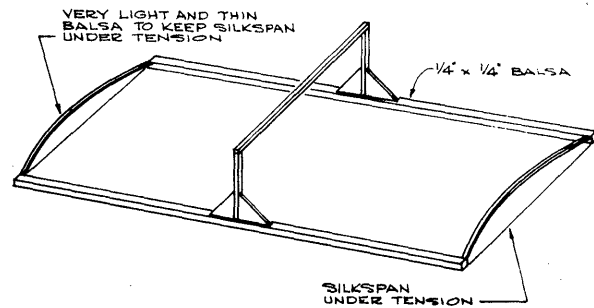
The German Nats were held in Westfallennalle in Dortmund, after two postponements due to last-minute rental of the hall. The ceiling is 24 meters high, with lamps hanging down and ventilator holes near the top. There were 31 entries, with results (top three) shown below.

<b>Class P1 (35 cm paper covered)</b>		
1. Gunter Maibaum		23:59
2. K. Nottelmann		21:23
3. W. Schaak		19:52
<b>Class P2 (65 cm paper covered)</b>		
1. A. Schwarz Sr.		22:05
2. P. Verbeek		21:29
3. A. Schwarz Jr.		21:02
<b>Class M1 (35 cm microfilm)</b>		
1. H. Tiemann		25:25
2. W. Jordan		18:16
<b>Class M2 (65 cm microfilm)</b>		
1. Kurt Vogler		50:44
2. W. Lueke		32:07
3. H. Langner		31:20

**HINTS AND KINKS**

**Kopecsky Covering Frame**

The sketch below amply covers the construction of this useful gadget by Ernie Kopecsky. In use, the frame is covered by placing it directly on the storage hoop; the film can be caused to adhere to the frame either by water or by rubber cement (rubber cement is probably preferable). It is then placed over the surface to be covered. The wing or stab has previously been wet down to the board in typical Bilgri covering style. As the covering frame is lowered over the wing, the light balsa end strips permit the film to conform to the rib shape; thus giving a smooth covering job with little extra effort. Thanks to Jim Mills for drawing up this sketch.



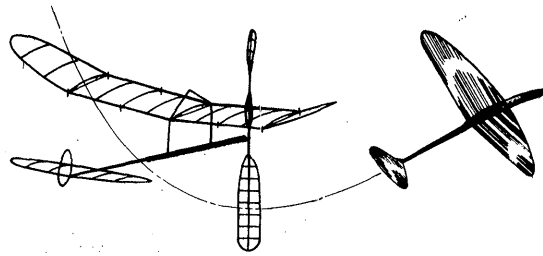
**KOPECKY COVERING FRAME**

(The above has been reprinted from an early INAV.)

# INDOOR

## NEWS and VIEWS

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



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

#### New Members!

HENRY H. FALES Jr., c/o Albert's Cabins, Rt.#7, Lanesboro, MA 01237  
 BILL GAIBER, 4235 SW Agate Ln., Portland OR 97201  
 T. L. McLEAN, 11754 Florinda Dr., San Diego CA 92127  
 DICK STAMM, 6613 E. 134th St., Grandview MO 64030  
 STANLEY W. WESOLOWSKI, 205 Weatherby Dr., Westwood MA 02090

#### Missed Any Issues?

In recent months, several people have written to say they have missed one or more issues. Apparently the Post Office is having more problems than usual, because the missing issues are neither delivered nor returned as "undeliverable", which used to be the case. If you have not received any particular issue within six weeks of when it should have arrived, or within a week of when a nearby friend receives his, please drop a line immediately. A couple of people have written after missing three or more consecutive issues, and by then it becomes nip-and-tuck as to whether a particular issue is still in print. It is preferable to me to have to deal with a few queries about an issue that hasn't been printed than to have to tell someone an issue is out of print because they waited too long to say they missed it!

It may seem unusual that recent issues are out of print before earlier ones, but this is a problem of any growing organization. In mid-1969, 300 copies of each issue were being printed to cover an average circulation of 280 copies per month. As soon as the circulation went up, it became necessary to increase printing to 400 copies per month and each month had a surplus of about 100 or so available as back issues. Now, we're near the point of needing an increase to 500 copies per month, and the files will soon be bulging with back issues again.

#### NIMAS Awards

Silver Cat. II HLG Award - 0:53.2, Richard Doig

#### New Materials!

Chet Wrzos sent some small wire hooks used by fishermen for quick-change mounting of fishing lures, and suggested that they would be useful as "O" rings on rubber motors. Although this type of hook is too heavy for FAI models, it is ideal for PennyPlane and strong enough to hold a fully wound P/P motor. The particular product Chet sent was "No-Knot Fas-Snap", by Nature Faker Lures, Windsor MO 65360.

#### New Hannan Catalog

Bill Hannan has announced the latest version of his "Plans & Things" catalog (25¢ postage and handling), and some neat little Peanut Scale mylar press-on decals. The decals are striking, and the catalog is the most interesting collection of Peanut Scale and fun/sport goodies that just has to be seen to be believed!

#### Renewal Reminder

Those whose newsletter was addressed with the addresser printer will note a number in the upper left-hand part of the address. If it is "11", your subscription expires with the November issue. Similarly, "12" applies to the December issue and "1" to the Jan. '74 issue. Please check and renew ahead of time if possible - it saves much time here in extra paperwork!

#### Future Issues - A Reminder

Future issues will present information on PennyPlanes and jigs and fixtures - provided that those who have info will share it!

#### RECORDS? MAYBE!

Chicago Aeronauts Indoor Contest - Nov. 4, 1973 Cat. II  
 Brig. Gen. R. L. Jones Armory, Chicago 90' ceiling  
 Cat. II Jr. HLG - 129.9, Bob Hayes, Jr.

### FAI INDOOR REPORT

#### U.S. Indoor WCh?

AMA has completed the proper arrangements with Lakehurst NAS to permit an offer to host the 1974 Indoor WCh at Lakehurst, sometime in July or August, 1974. The Indoor event would be combined with a Scale WCh, running concurrently. The reason for combining the events is to make possible the offer of a charter flight from Europe, as was done for the 1971 RC WCh, held at Doylestown, Pa. The decision will be made at the upcoming CIAM meeting in Paris. At the same meeting, it is expected that Poland will also offer to host the 1974 Indoor WCh, and some rumors have it that Romania will again offer the salt mine for the event. It may be possible that the decision will be known in time for the Nov. '73 INAV.

#### FAI Program Czar

The Sept. '73 INAV reported that Frank Ehling has been appointed as FAI program "czar", and noted that Ehling had requested clarification of his status from the Executive Council.

No official word of the Council's vote has been revealed, even to individual Council members, but Ehling is proceeding to design an Indoor Program for the Council's approval. This action circumvents all established guidelines, and causes the viability of all other guidelines to be open to question. However, the guidelines were created by the Executive Council and can thereby be set aside by the Council. One must hope that the guidelines which were the result of years of experience will be replaced with enough new guidelines to prevent mass confusion.

### CONTEST CALENDAR

#### CALIFORNIA - Santa Ana

Indoor sessions at Santa Ana MCAF on Nov. 24-25 and Dec. 22-23, 1973. Contact Bob Randolph, 25145 Lawton Ave., Loma Linda CA 92354.

#### CONNECTICUT - Glastonbury

The Glastonbury Modelers are holding indoor sessions with their club meetings Dec. 6, Jan. 30, Feb. 26, Mar. 12, Apr. 2, May 7 and June 4, 7 pm to 9:30 pm. Also on Sundays 8 am to noon, Jan. 20, Feb. 17, Mar. 17, Apr. 21 and May 12, 1974. Sessions at Glastonbury High Gym. Contact George Armstead, 89 Harvest Lane, Glastonbury CT.

#### MASSACHUSETTS - M.I.T.

Indoor sessions at DuPont Gymnasium, Vassar St. and Mass. Ave., Cambridge, Mass. (use Vassar St. entrance). Dec. 1, 1973, 3 pm to 6 pm. Jan. 12, Feb. 9, Mar. 9, Apr. 6, 1974, 6 pm to 9 pm. Indoor contest May 4, 1974, 10 am to 7 pm, Indoor Stick, HLG, Indoor Scale, Peanut Scale, PennyPlane and Delta Dart. Contact Ray Harlan, 15 Happy Hollow Rd., Wayland MA 01778.

#### NEW JERSEY - Union

Indoor sessions at Livingston School on Midland Ave., Union NJ, 7 pm to 10 pm, Dec. 13, 1973 and Jan. 10, Feb. 14, Mar. 14, Apr. 4 and May 9, 1974. Sponsored by Union MAC; contact Dan Domina, 1229 S. Long Ave., Hillside NJ 07025.

#### OREGON - Albany

Indoor contest Jan. 20, 1974, 10 am to 3:30 pm; HLG, Easy B, PennyPlane, Indoor Scale, Indoor Stick, Paper Stick. Feb. 9, 7 pm to 10 pm, Indoor Fun-fly. Feb. 10, Indoor Scale meet 10 am to 3:30 pm. All events at South Albany High School Gym, 3705 S. Columbus Ave., Albany. Site has 42' ceiling to obstructions with 75' x 105' floor area. Bob Stalick, 1120 Shady Lane, Albany OR 97321.

#### TEXAS - Dallas/Ft. Worth

Indoor contest Dec. 2, 1973 at American Airlines Hangar, Greater SW Airport, Ft. Worth. HLG, PennyPlane, Easy B, Peanut Scale, Towline Glider, 1 pm to 6 pm. Contact Don Chancey, 611 Bedford, Richardson TX 75080.

## DESIGNING SENSITIVE BEAM BALANCES

by Ray Harlan

This note presents the design of a beam balance which is sensitive to .0001 oz and accommodates up to .050 oz. The significant design theory is included to permit modification to suit each builder's taste. Although the balance was made with the help of a milling machine, all the parts can be made by hand if care is taken.

### Theory

The position of the fulcrum with respect to the center of gravity of the beam determines how far the beam will tip if a small weight is put on the hook (i.e. the sensitivity). For indoor models, one should be able to see clearly a change of .0001 oz. To find the relationship between the fulcrum height and the sensitivity, the beam can be simplified as in Fig. 1. It is convenient not to make both legs equal so as to limit the overall length to something reasonable while retaining a long scale. The short leg is weighted to balance the beam with nothing on the hook. Finding  $L_1$  and  $L_2$  is easy if the beam has constant cross-section. In this case  $L_2$  is half the right leg length. If the density ( $D$ , oz/in.) of the beam material is known together with the weight ( $W_b$ , oz) required to balance the beam,  $L_1$  is approximately:

$$L_1 = \frac{2DL_2^2}{W_b + DL_4} \text{ inches}$$

This equation is derived from equating the moments about the fulcrum. This sensitivity can be found in the same manner by assuming a small weight to be put on the hook and solving for the beam deflection. The result of a small weight,  $w$ , is that the right end of the beam will rise an amount,  $z$ , which is approximately,

$$z = \frac{wL_3}{\gamma D(1+L_2/L_1)}$$

As an example, let  $L_1 = 6"$ ,  $L_2 = 6 \frac{1}{4}"$ ,  $L_3 = 6"$ . For a  $1/2" \times 1/8"$  aluminum beam,  $D = .1$  oz/in. If  $w = .0001$  oz, and a movement of  $.1"$  for  $z$  is desired, the equation can be rearranged and solved for  $\gamma$ , which becomes  $.0294$  in. Thus, we must be very careful to know where the center of gravity of the beam is, and to place the fulcrum close to it. If  $z$  is doubled, the sensitivity is halved.

### Fulcrum

A sharp fulcrum is necessary and a razor blade is satisfactory if rigidly held in place on the beam. Fig. 2 shows an aluminum block which holds the blade with screws. If made by hand, two  $1/4 \times 3/8 \times 3/4$  aluminum blocks can be substituted, eliminating the need to saw a slot. Also thin wedges can be used to secure the blade. The blade pivots on  $1/8"$  aluminum edges (see Fig. 6).

### Damper

A very useful feature is a magnetic damper. This limits the swing of the beam to one or two overshoots and is particularly handy when drafts are present. The damper uses two ceramic magnets about  $3/4" \times 1"$ , often found on typing correction tape (Touch and Go) boxes. They are epoxied to angle brackets as shown in Fig. 3 and mounted  $1/8"$  apart on the baseboard. Make sure they are oriented to attract each other as strongly as possible. The damper arm is thin (.020" or less) aluminum epoxied to the beam.

The damper does not affect the accuracy or sensitivity of the beam. The damping forces are proportional to the speed of the damper arm only. One caution, however; keep all steel slide wire screws well away from the magnets. It may be better to use brass for these.

### Sliding Weight And Scale

By putting the weight on a slide wire it won't get lost. Fig. 4 illustrates the design. The heavier the weight, the longer you can make  $L_3$ , for a given  $L_2$  and scale capacity. Mine is .024 oz. which, with the figures used under Theory yields a capacity of .050 oz. Fig. 4 shows the weight and slide wire. Carefully position the left slot head screw so the slide weight is pointing to zero when touching this screw.

The brass weight can be made to approximate length and then taken to the nearest university for finishing with a file. Most biology labs have accurate balances (e.g. Metler) with sensitivities in tenths of milligrams. (.001 oz = .02835 gram.)

If a milling machine is available, the scale can be engraved by attaching the beam with double-faced tape

(against stop pegs) and securing a tool bit in the spindle. Lines for thousands of an ounce can be ruled  $.2"$  long (.01 to .015 deep), while those for .001 oz increments can be made  $.1"$  long. Spacing of  $.050"$  is convenient in this setup. If done by hand,  $1/16"$  may be more convenient. The lines can be filled with China marker and the excess wiped off.

### Hook

The hook can be .016 wire in a .020 hole and can have the shape shown in Fig. 5. The baseboard shouldn't project far beyond the fulcrum toward the hook.

### Zero Adjust

A 2-56 x 1" or 4-40 x 1" screw can be secured in the balance weight (Fig. 6). Two nuts on this screw can be moved to provide fine balance adjustment when the slide weight is at zero.

### Use

Place the baseboard so that the fulcrum projects from the edge of a table a few inches. A thin table is best, as it permits the wing of a complete model hung from the nose to swing under it freely. If the table does interfere, make a long hook extension to lower the model several inches. Be sure to subtract the weight of the extension.

The accuracy of the balance depends only on the care with which  $L_3$  and the scale are laid out and the accuracy of the slide weight. Greater sensitivities than .0001 oz can be achieved, but the beam may be unstable for large deflections.

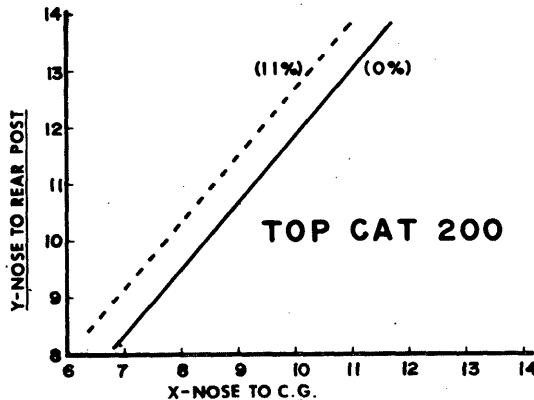
**Note:** All illustrations for scale on p. 4.

## STATE OF THE ART

The model of the month is overdue in two respects - it was ready for printing three issues ago and kept getting crowded out. Also, as soon as Ernie Kopecky heard of Bob Randolph's 44:50.2 flight which eclipsed Ernie's 43:42 set at the 1963 Team Finals in Santa Ana, he said, "Send Bob my congratulations! I've held the record too long!"

Bob has been sneaking up on the record for over a year, with several different models. Of the record hop, he remarks, "This version of Top Cat had a thick section wing to hold the climb down. Evidently the thick wing also reduced the average RPM from the usual 50-52 down to 42.6. I was well centered for most of the flight and grazed the beams 12-15 times, the last time at 16 minutes. It went off with 2240 turns and landed with 336."

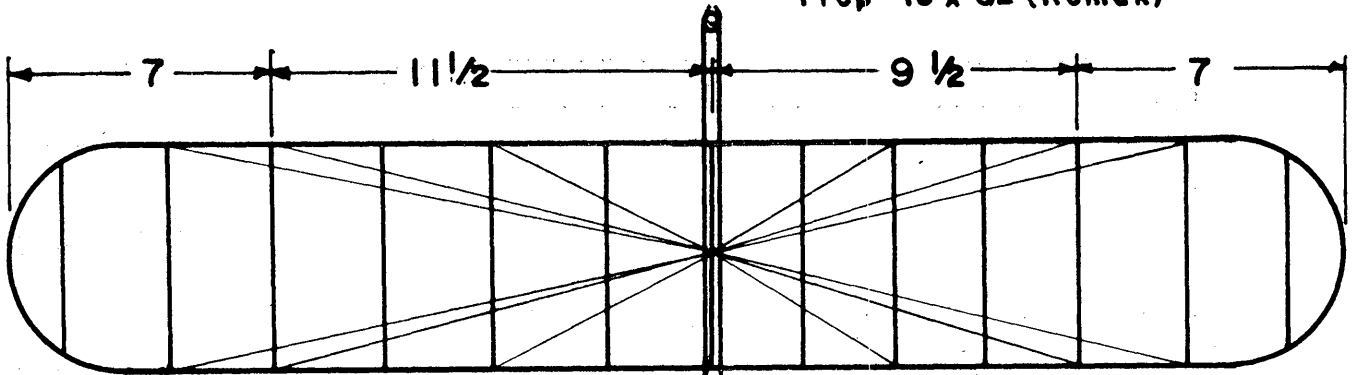
Bob's trim setting checked out at +1% on the CMOS charts, even with the forward wing position. The graph below shows both +1% and 0%.



## HINTS AND KINKS

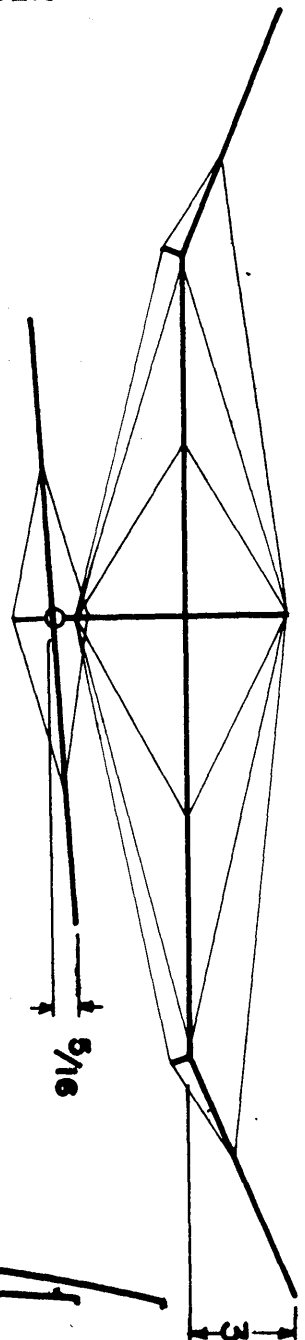
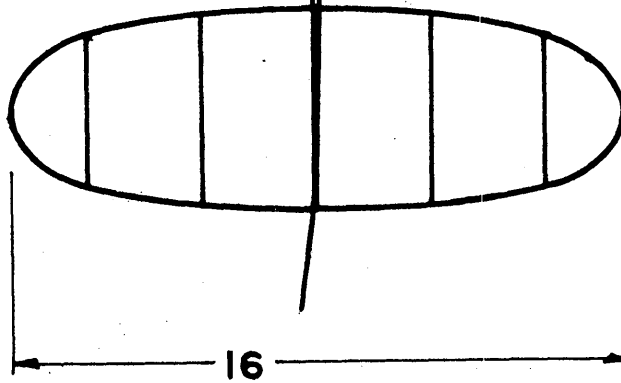
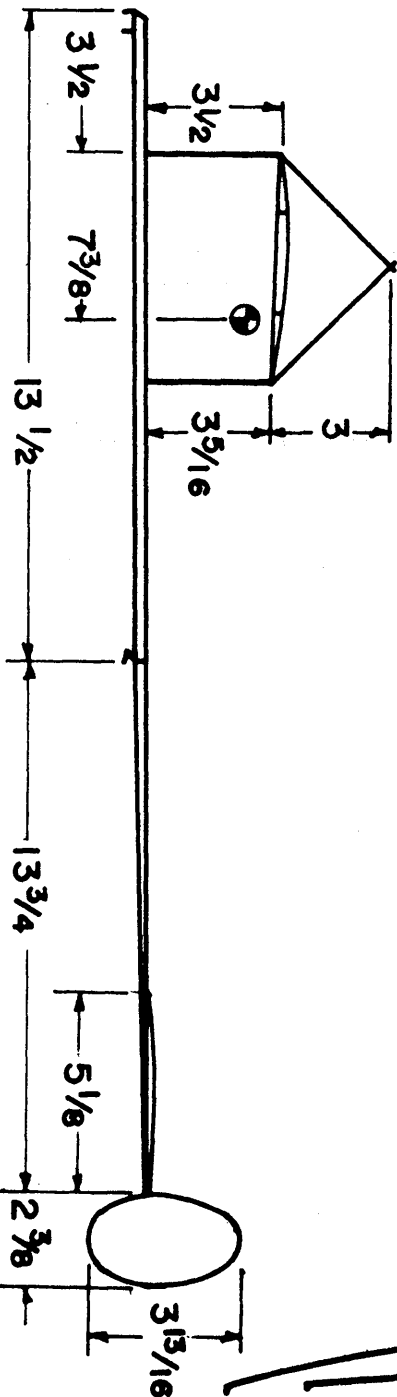
The bottom part of p. 4 is a reprint from 1968, showing Bob Putman's method of repairing a wing which lost film in a bad place - next to the cabane. He prepared the patch by using saliva to stick dacron monofilament across the hoop. After this dried, he trimmed the film loose on the outside of the patch to give room for the wing tip and cabane (not shown) to drop past the patch. Once the film is ready and the bracing is removed from the top of the wing, the patch job is just like covering - lay the wing down, attach the film and trim it loose.

Prop-19 x 32 (Romak)



WING	.0109
FUSE	.0168
PROP	.0068
TOTAL	<u>.0341</u>

POWER - 20" of .055  
 2240 TURNS  
 AV. RPM - 42.6



**TOP CAT 200**  
 44.50.2 Santa Ana  
 26 May 1972  
 Bob Randolph



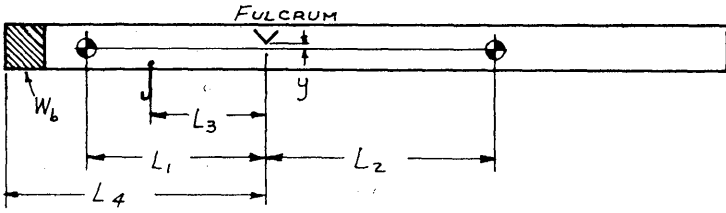


FIG. 1

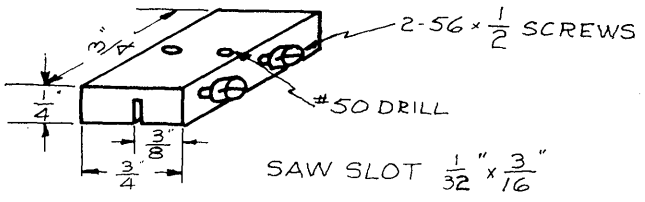
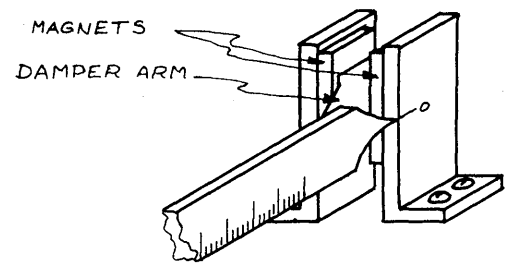


FIG. 2

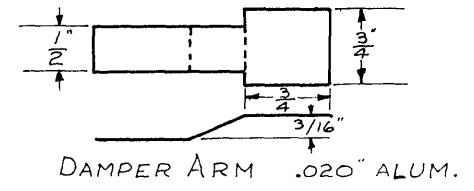


FIG. 3

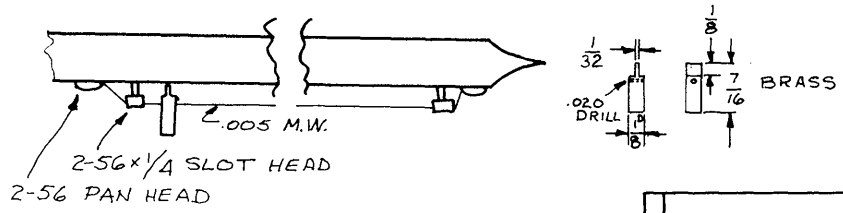


FIG. 4

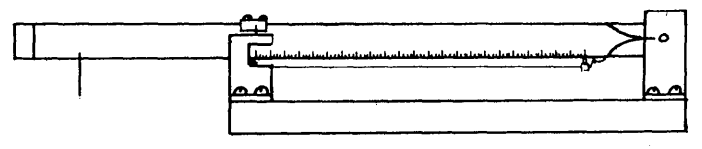


FIG. 6

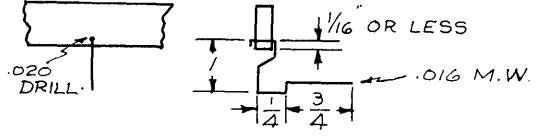
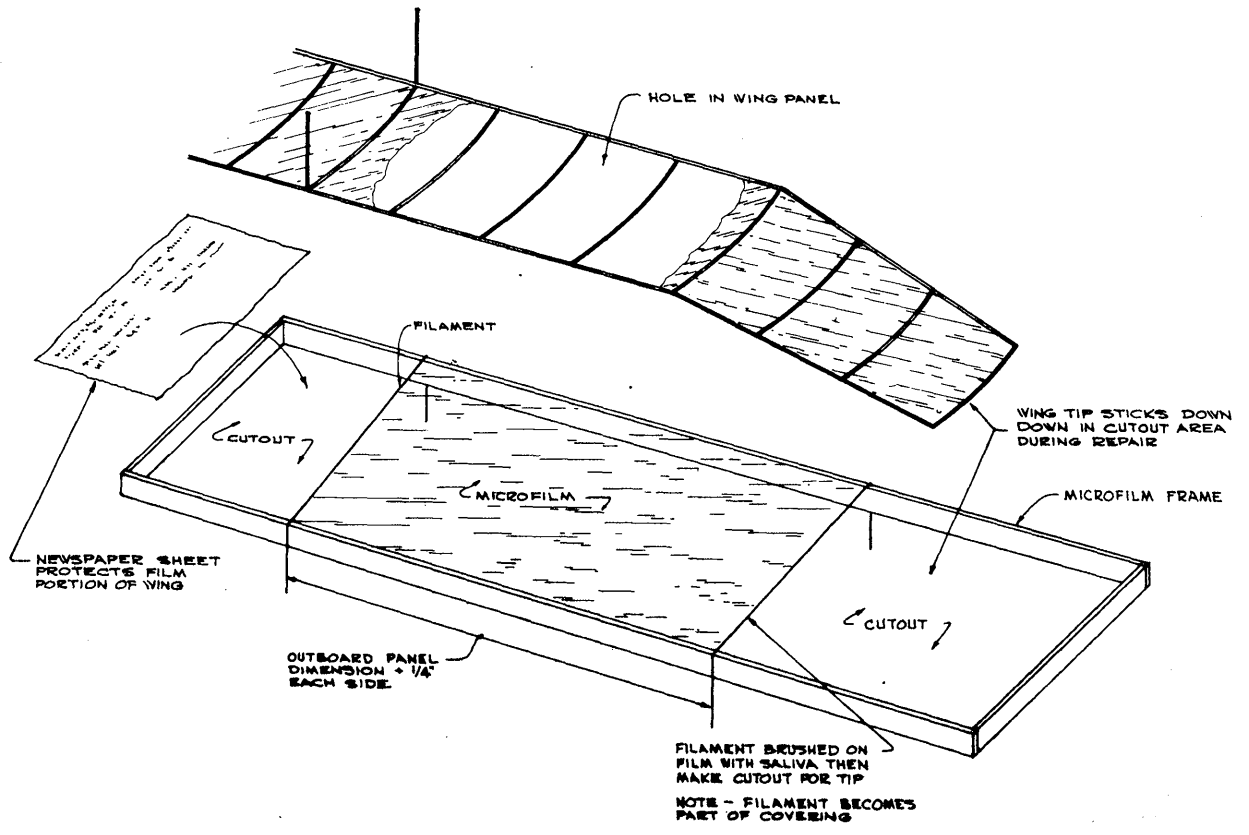


FIG. 5



# INDOOR

## NEWS and VIEWS

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

### New Members!

TIM LAVENDER, 109 Villa, McMinnville TN 37110  
 GYORGY G. POLCZ, M.D., 109 Riverside Ave., Muncie IN 47303  
 FREDERICK WUNSCH, 3395 South Blvd. E, Auburn Hts. MI 48057

### This Issue

It has been a fond hope and expectation around here that the INAV publishing schedule would eventually catch up to the schedule that used to be. With a 50-hour work week and an occasional 11 or 12 hour day, not much progress has been made. In addition, correspondence is way behind. Normally, correspondence is the life-blood of INAV - our mutual interaction is what has traditionally resulted in the broad variety of material available. That is, I note a comment which indicates you have something we would all like to know, then I ask for it.

Happily, many of you have sent material w/o prompting and others have responded to the pleas in recent issues for PennyPlane and Jigs & Fixtures info. So, in this interim (we hope) interval, please continue. If possible, camera-ready drawings are preferred, but all info will eventually be used. It just takes time to draw it all up - which detracts from time for correspondence.

So, the Nov. '73 issue is a late Christmas present, and Merry Christmas to you all!

### Aeromodeller Annual - '73/'74

The new Aeromodeller Annual is out - as usual, it is easily classifiable as a collector's item. Topics range from FAI Indoor and Easy B thru all the most popular outdoor classes and cover some sport models and the latest developments in electric powered models. Ron Moulton's editing is clearly up to his usual high standards, and he is to be thanked for his efforts. Contact Model & Allied Publications Ltd., 13/35 Bridge St., Hemel Hempstead, Herts, England for prices and ordering info.

### '74 Nats

The latest word is that the 1974 Nats will be held at Chennault AFB, Lake Charles, La., early in August. Very good outdoor facilities and housing accommodations are said to be available. Indoor arrangements include two possible low Cat. II (50' - 60') sites and also the Goodyear blimp hangar in Houston, Texas, 130 miles away. More details will be given as they are available and firmed up.

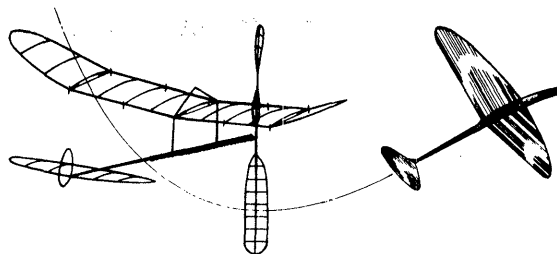
### Financial Report

1973 NIMAS income reached an all-time high, due to donations, the 25¢/year dues increase (now \$3.25/year) which began in Jan. '72, and another banner year of membership growth. At the same time, expenses increased in proportion to growth, with an added boost due to an increase in printing costs. To lessen the suspense, income amounted to \$1044.79 for the year, with expenses totalling \$934.61 - a surplus of \$110.09. Looming in the immediate future is a postal increase of 2¢ per domestic mailing, and the immediate need to increase the number of copies printed of each issue. The increase in number of copies needed is due to the expanding membership as outlined in the Oct. '73 INAV. The income/outgo breaks down thus:

Printing costs	347.57
INAV postage	347.01
Correspondence postage	88.68
Office Supply, misc.	151.35
	<u>934.61</u>

The newsletter circulation increased from an average of 330 in 1972 to 345 in 1973, for a 4.5% increase. The incoming mail amounted to 1374 pieces, and outgoing correspondence amounted to 1412 pieces, with much of that to service new memberships and inquiries.

While pondering the expected increase in expenses, a projection based on the normal 5% growth and the 25% increase in domestic postage costs yielded a projected income of \$1177 and expenses of \$1116 as follows:



Printing costs	398.00
INAV postage	478.00
Correspondence postage	90.00
Office Supply, misc.	150.00
	<u>1116.00</u>

This projection shows a projected \$61 surplus for next year, barring another increase in printing costs. It has been a fond hope that the NIMAS decal could be re-issued, especially since many present members have never seen the decal and others would like to get more. The original issue of the decal was essentially a gift, so perhaps care in planning can give a plan of some free decals and some sold for a price which will permit the cost to be mostly amortized so new decals could be printed without financial crunch.

### SPECIAL INTERNATIONAL ISSUE

Once again, the November issue is dedicated to all the indoor fliers around the world whose activity complements the U.S. activity and often drives us to greater performance just to catch up! It is especially good that this issue also announces the 1974 WCh at Lakehurst - and we can look forward to meeting many of our friends from other lands - in friendship and competition.

### FAI INDOOR REPORT

#### '74 WCh In U.S.!

Word from the CIAM meeting in Paris is that the U.S. bid to hold the 1974 Indoor World Championships at Lakehurst NAS was accepted. More details are expected later, but the presently planned dates are July 1-7, 1974. The key to the acceptance was the offer to host RC Pylon contest during the same time frame, which enabled plans to run a charter flight from Europe at rates which could be reasonable.

### FAI 74/75 - A Massive Upheaval

In the past ten weeks, the AMA Executive Council has acted in almost total secrecy, considering ideas put forth by FAI Czar Frank Ehling. These ideas, if accepted by the Council, would force regional Finals upon both FF and Indoor programs and would eliminate all formal FAI Indoor competition except the Finals. The program questionnaire, which formerly gave participants in previous programs some opportunity to express their views, apparently will be totally eliminated. Qualification for the Finals is proposed to be only via AMA contests, (including FAI Stick to be added to the Nats) but entrants in other AMA contests can use Easy B, PennyPlane, Indoor Scale, Peanut Scale and some Indoor Stick and Paper Stick models to qualify. If the Council approves the basic proposal of regional Finals with staggered entry to allow entry in all three, Ehling would then make the following proposals as quoted from Ehling memo of Nov. 8, 1973:

1. Select three CD's from each interest who would basically be from the western, central and eastern areas who would be the area finals CD's for a particular interest.
2. They would agree upon uniform qualifying performances (times, points, scores or places) to become eligible to fly at anyone of the three finals sites. Their requirements would come from past program requirements, contestant inputs and any inputs I could contribute from past knowledge of what worked best.
3. They would agree on which area would start the finals so the finals could be best attended and with approximately 30 days between dates to further increase attendance from those who could travel.
- 4, 5, 6 - details of program entry and HQ paperwork.

In fairness to the Executive Council, it should be noted that the October and November issues of the club mailings and Competition News made no mention of the Council's deliberations on this matter, and that the Council normally does not control the contents of these mailings. In fact, one Council member noted that HQ had not even communicated to him the results of initial voting which (implied in Ehling memos, but not revealed to date)

apparently gave Ehling essentially carte blanche power to handle FAI programs as he sees fit. In the most recent mailing, the negative vote of Dist. VIII was not circulated, but five responses which were either partly or wholeheartedly in agreement with basic Ehling proposals were circulated.

In summary, and speaking from the limited viewpoint of an Assoc. VP who has been consulted by his VP, this affair has many aspects of both managed news and secret meetings which contrasts starkly with the free and open member communication we have enjoyed in the past few years. Your VP has recently received a ballot which asks for the Council's selection of single site, regional site, or "pick Team at Nats" for each of the five FAI interest groups. Based on the five (out of 14 possible!) responses circulated, regional sites for FF and Indoor would be approved. It is likely that individual members will not be able to express an opinion except to his District VP. If you wish to do so, find your VP in the list below:

- I - Cliff Piper, Highland Ave., Atkinson NH 03811
- II - Josh Titus, 146 Garden Ave., Paramus NJ 07652
- III - Ron Morgan, School For Vet Children, Scotland PA 17254
- IV - John Spalding, 5803 Ellerbie St., Lanham MD 20801
- V - Jim Perdue, Kingston Circle, RFD #4, Athens TN 37303
- VI - Glenn Lee, 102 W. Mandrake, Batavia IL 60510
- VII - Jack Josaitis, 23663 Lawrence, Dearborn MI 48128
- VIII - Murray Frank, 2933 Blankenship, Wichita Falls TX 76308
- IX - Stan Chilton, 1401A S. Hydraulic St., Wichita KS 67211
- X - Alex Chisolm, 1100 West Shaw, Fresno CA 93705
- XI - Bob Stalick, 1120 Shady Ln., Albany OR 97321

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#### RECORDS? MAYBE!

Thermal Thumbers Record Trials, Nov. 24-25, 1973 Cat. III  
 Santa Ana MCAS, Santa Ana, Calif.  
 Junior Indoor Cabin - 12:29, John Magnus  
 Junior A ROG - 3:04.8, Ken Bauer  
 Junior HLG - 1:58.2, Ken Bauer

#### STATE OF THE ART

This month, there are four models - two top FAI models from Romania and Czechoslovakia, a 35 cm model from Great Britain and an "almost" PennyPlane from Sweden.

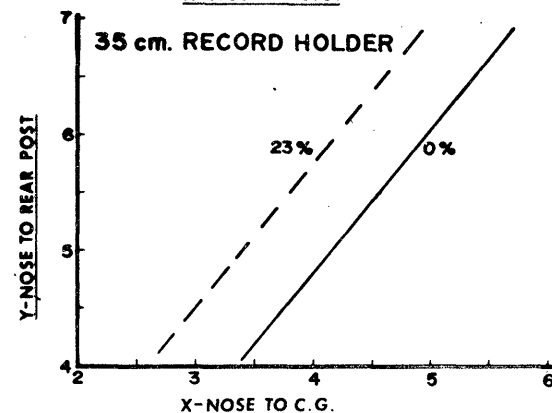
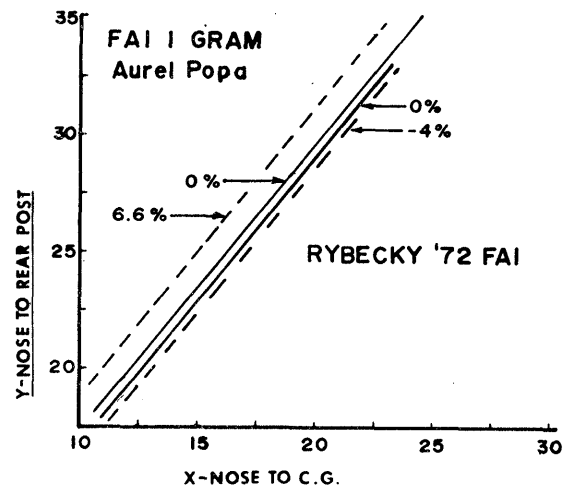
Karol Rybecky's 1972 FAI placed 2nd at the '72 WCh, then went on to garner its high time at the 1973 contest at Slanic (the salt mine). The model was developed from his previous (pre-one gram) models, and is a bit smaller than the current practice in Europe, with Slanic conditions in mind. Karol is pleased with the model's performance - 2nd at the WCh and 3rd at Slanic with 1½ minutes more time than 1st at the WCh - and feels the basic design is good for less experienced fliers.

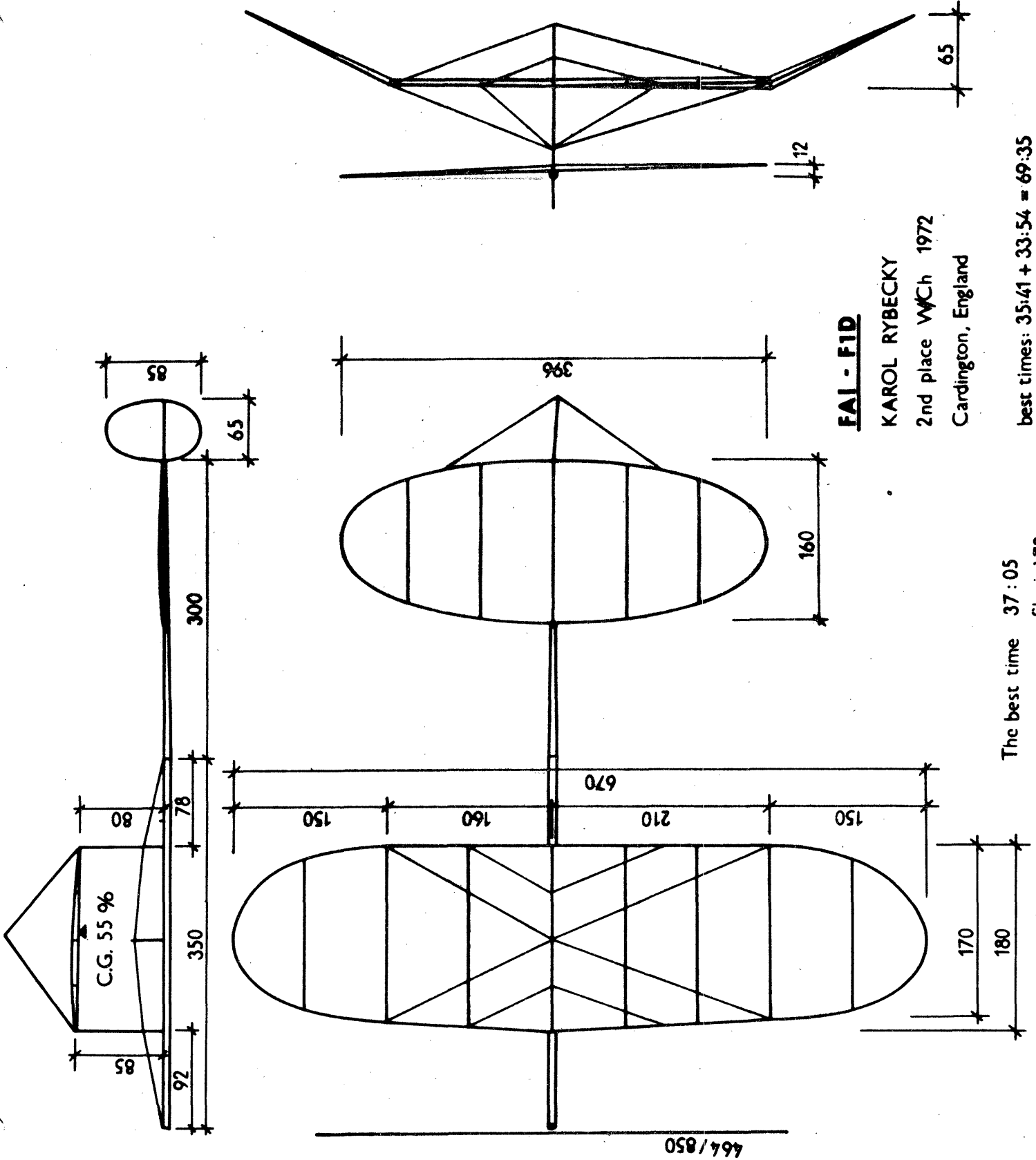
Aurel Popa is a young man with the touch for indoor that is rapidly making him a master. He has lately led the pack in Romania, and with the model shown he won the '73 Slanic meet with a handy 70 second margin.

Marty Shepherd's 35 cm model now holds the British record for that class, and is somewhat representative of a trend toward smaller models as an alternative class in Europe. At least three other countries now fly smaller models, with Hungary the latest to begin. Marty gave no indication of restrictions on the English 35 cm class, but the Hungarian class is 45 cm, one gram, 15 cm max wing chord and 20 cm motor stick length (hook to hook). Poland and Czechoslovakia are trying similar specs except for a 50 cm span.

Finally, the "almost" PennyPlane! In Sweden, the 25 ore coin is similar in size to the U.S. penny, but with 2.3 g weight instead of the 3 g weight of the penny. In recent months, the 25 ore class models have increased in wing area - paralleling PennyPlane development in the U.S.

All plans except Marty's are in metric, as are the CMOS charts below. As usual, the dashed lines represent the designer's trim location in contrast with 0% margin. INP (see Mar/Apr '73 INAV) for Rybecky = 35% margin; for Popa, INP = 32%.





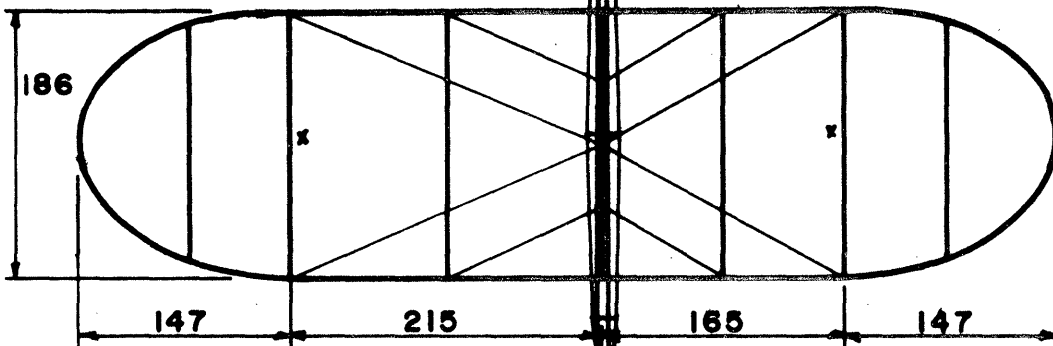
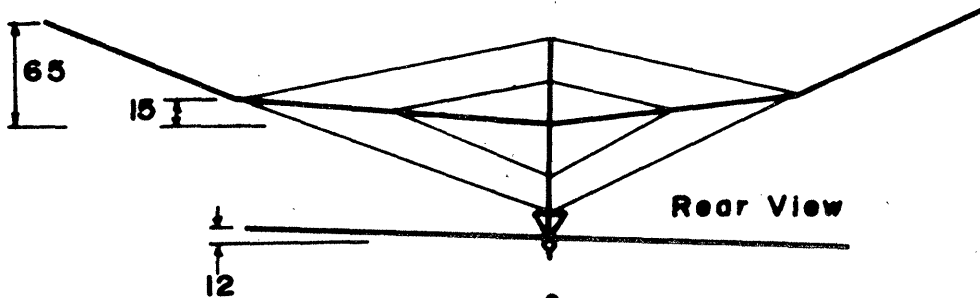
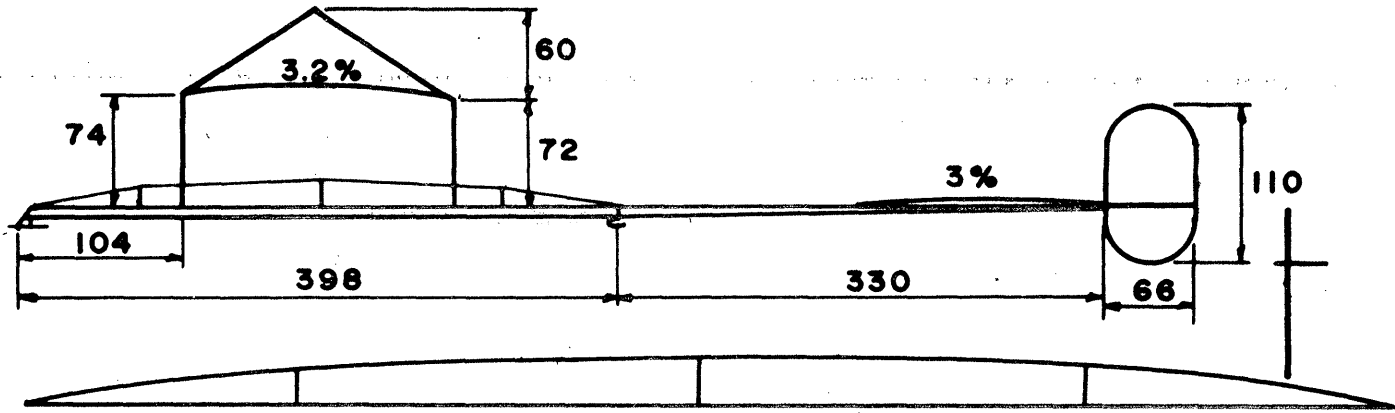
**FAI - F1D**

KAROL RYBECKY  
 2nd place WCh 1972  
 Cardington, England

The best time 37:05  
 Slanic '73

best times: 35:41 + 33:54 = 69:35

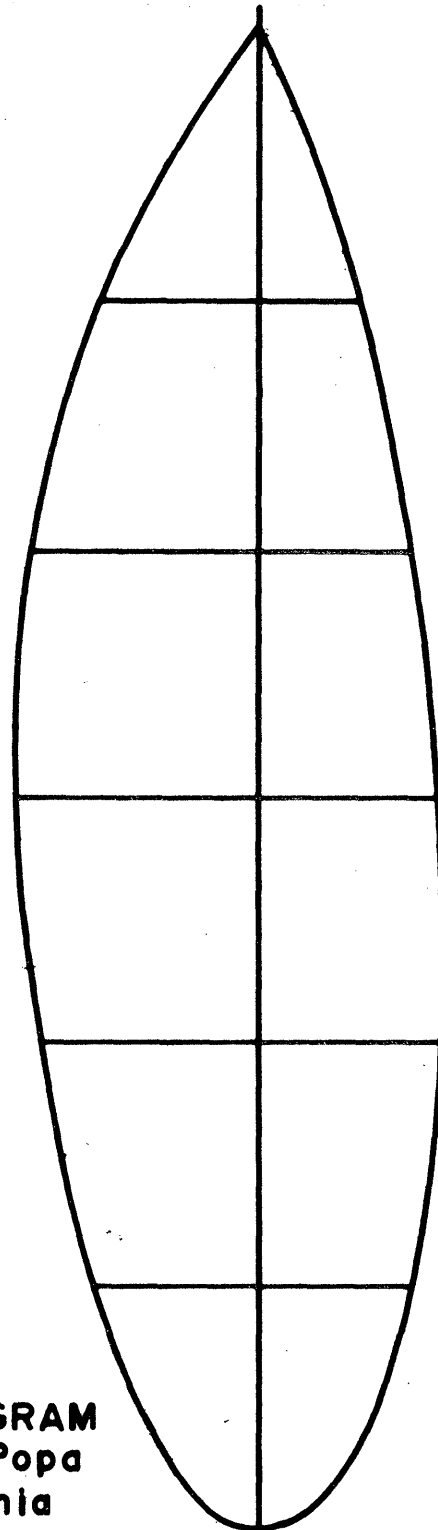
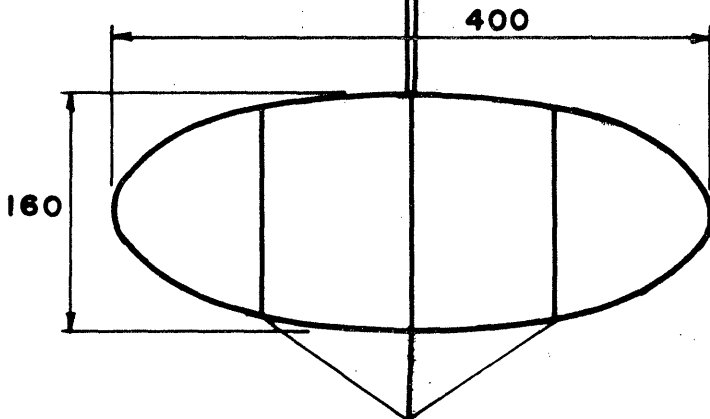
464/850



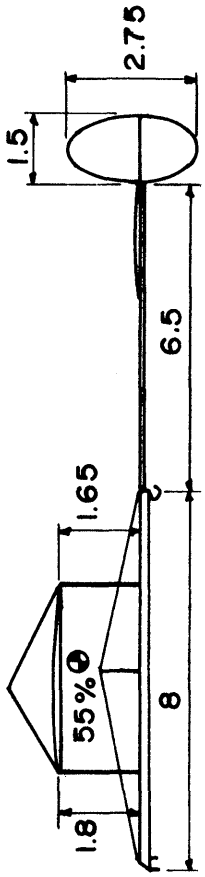
**Weights**

Fuselage	0.63 g
Wing	0.29
Prop	0.164
	<u>1.084</u>

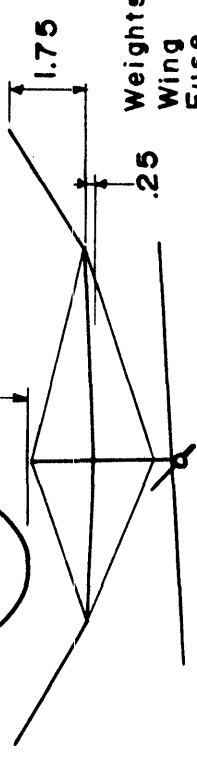
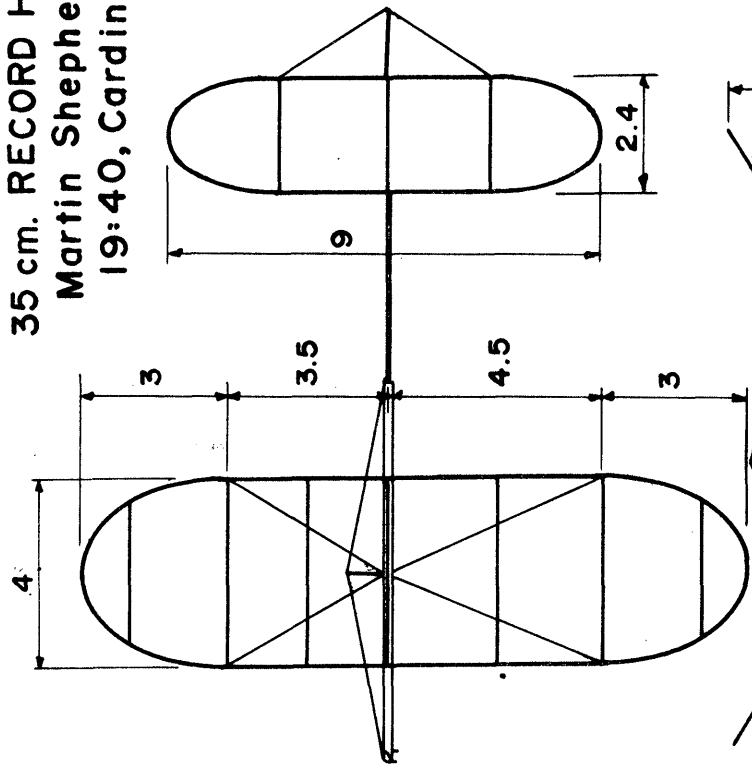
**Rubber**  
 445 mm loop  
 1.26 g, 2400 T.  
 39:16 at SLANIC



**FAI 1 GRAM**  
**Aurel Popa**  
**Romania**

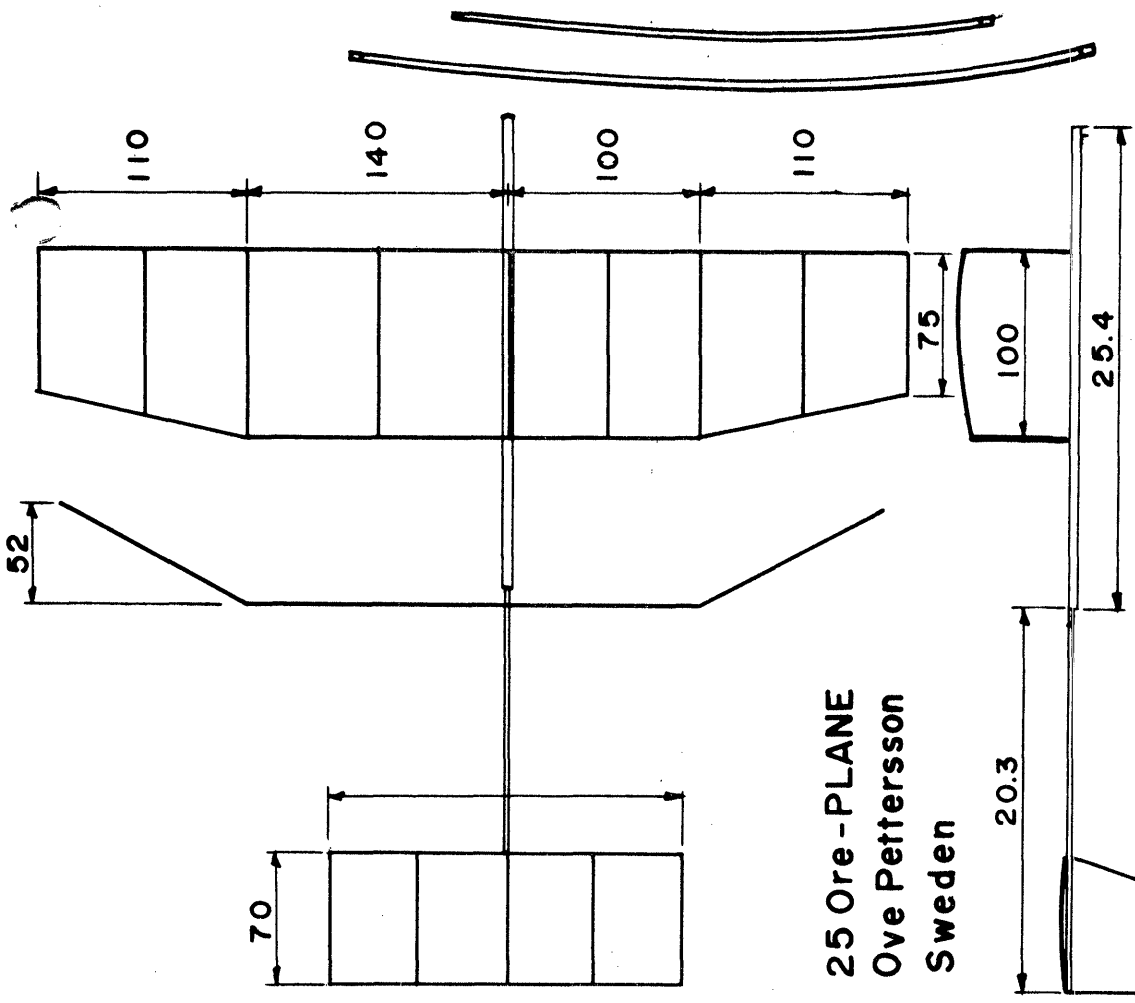
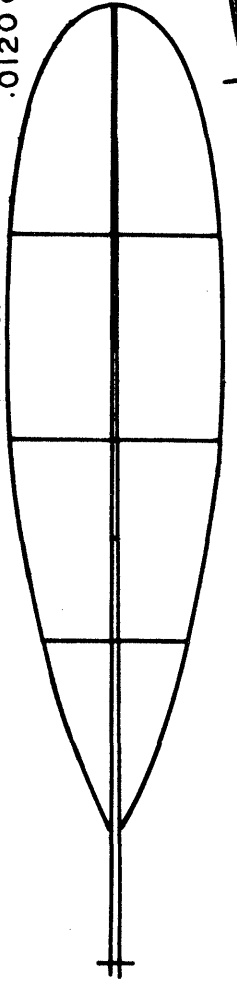


**35 cm. RECORD HOLDER**  
**Martin Shepherd**  
**19:40, Cardington**

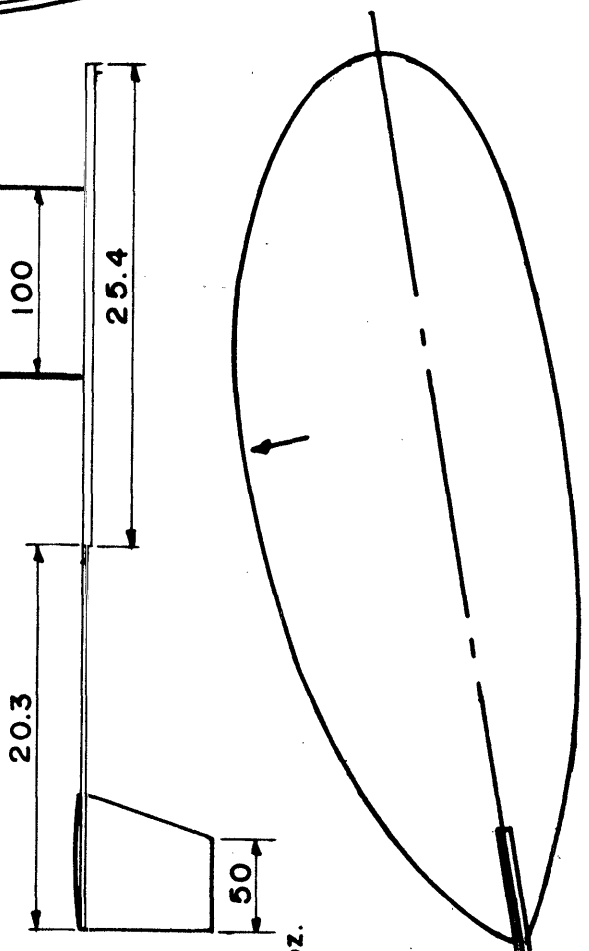


Weights  
 Wing .0030  
 Fuse .0063  
 Prop .0027  
 .0120 oz.

i.e.



**25 Ore - PLANE**  
**Ove Pettersson**  
**Sweden**



# INDOOR

## NEWS and VIEWS

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

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

### New Members!

L. T. MYTINGER, 25 Renfrew Ave., Middletown RI 02840  
MIKE REGAN, 18145 Leatherwood Way, Irvine CA 92664

### Thank You!

Once again, we received many Christmas cards from many lands. We appreciate these, and the messages of good will. It has become impossible to return these wishes, except in this way. So, we hope that all of you had happy and bountiful holidays, and we wish you the very best for 1974.

### New Materials!

Dave Linstrum and Charlie Botich are "pushing" a new material called Fomocore. It is available from artist supply stores, and consists of light plastic foam with light card stock on both sides. It comes in thicknesses from 3/16" to 1/2", in 4' x 8' sheets for prices ranging up to about \$7 per sheet. The thinner versions can be creased and then folded like corrugated cardboard, making it possible to bend and glue model boxes (Elmers Glue or aliphatic resin works best) just as with cardboard - but lighter and prettier. There will be some tricks to using the material, and it is hoped that an article will soon be available to explain the material.

### HLG Info Anyone?

INAV has a lot of good HLG fliers in the "audience", but it is seldom that any HLG material comes this way. So, how about it?

### Indoor Postal Contest

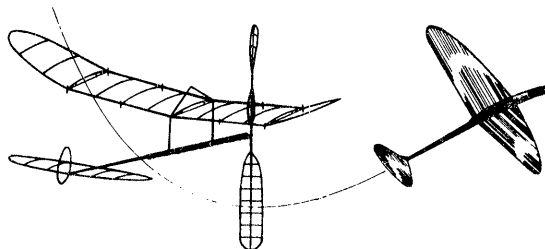
The Midwinter Iceburg Junior Contest will be held during January and February, 1974. It is for fliers thru age 15, and details are available from Richard Whitten, P O Box 176, Wall Street Station, New York NY 10005.

### Filati Quality

Ever since the original manufacturers of the rubber strip we still call Filati sold out to another firm and the product became Filati, there has been concern over what the quality of the new product would be. The worst fears of all us "worry-warts" seemed to be proven true as the first shipments of Filati seemed to be of shoelace quality. Happily, the manufacturer was eager to work to upgrade their quality, and a shipment received by Ian Kaynes (editor of FREE FLIGHT NEWS) seemed to have better characteristics. The best of all worlds would be for us to find a manufacturer willing to work with us to control their quality toward our needs. Because of the very low total usage of rubber strip by all modeling, it is not hopeful. Maybe we can be lucky!

As long-time readers of INAV know, the matter of rubber quality, and how to test for it, has been a concern of mine. Since Filati has indicated enough interest to try to meet our needs, we may be able to "close the loop" by telling them which batches meet our needs best. If their production records are good enough to identify processing differences between batches, the result could be custom rubber production to our standards.

Wakefield fliers, especially those with torque-controlled trim which adjusts for differences in rubber hardness, are unanimous in their desire for rubber with the highest possible energy storage capability. Indoor fliers tend to prefer either hard or soft rubber, again with the highest possible energy storage. For all but the highest ceilings, rubber of the proper hardness can be more useful than softer rubber with higher energy. The real problem of giving feedback to Filati on rubber quality will be to quickly determine the suitability of any particular batch, or perhaps to route specific batches to either indoor or outdoor fliers, depending upon batch characteristics. If we learn enough about rubber to make the measurements, it will be possible to get the best usage from the rubber we can get. Once again, we should pool all our knowledge on rubber testing!



### FAI INDOOR REPORT

The Nov. '73 INAV reported on the apparently secret AMA Executive Council discussions of program proposals by FAI Czar Frank Ehling. The December Club Mailing - #3 since beginning of the discussions - still had no mention of this matter. The December Competition News has a preliminary report (page 8) revealing some Council thinking.

A Sept. 20 Ehling memo asked whether programs should be designed to yield the best team or whether good teams should be sought via programs designed to encourage participation by more modelers. More specifically, the question was (1) pick teams with grass roots participation or (2) without grass roots participation. Favoring (1) were III, IV, V, VI, VII, X AND XI. Favoring (2) were I, IX. Dist. VIII responded without commitment and Dist. II did not respond. Dist. XI also stated that he felt the two concepts were not mutually exclusive.

An Ehling memo on Oct. 16 asked for permission to deviate from established guidelines in establishing new FAI programs. Nine districts granted this permission to deviate from guidelines in forming programs to be approved by the Council, VII said guidelines should be followed and Dist. II did not respond.

At this point, the report mentions the Council mailing reported in the first part of the Nov. '73 INAV comments, but obviously could not report on any results. For those who wish to contact their VP's on this matter, the listing of AMA VP's in the Nov. '73 INAV should be corrected per these election results:

V - Jim McNeill, 617 S. 20th Ave., Birmingham AL 35205  
XI - Homer Smith, 1417 NW 191st St., Seattle WA 98177

### An Editorial

However dark the picture may seem to many of us, it is heartening to remember that matters mentioned above represent the first FAI decisions in years which conform to By-Law requirements for such decisions. From a personal standpoint, I do not like starting essentially from zero when we had a working setup. I do not like having no say whatsoever in the program makeup. Finally, if I lived in Dist. II (New York & New Jersey), I would be pretty upset that I had not been represented in these decisions. Also, on the brighter side, it is possible that the matter will be reviewed, since my personal grapevine reports that some members of the Council are balking on responding to the ~~the~~ December Ehling memo requesting the Council to designate single site, regional finals or Nats selection for each of the five FAI interest groups.

It is still inexcusable, to my thinking, that HQ has neglected to mention anything of this whole matter until what might have been the final ballot was already in the hands of the Council. I feel certain that the Council had no intent of conducting its business in secret; however, I cannot believe the Council was unaware of the lack of membership communication.

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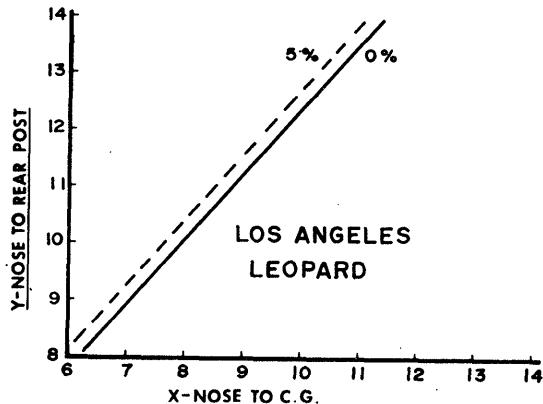
TOP TEN EASY B

Name	Time	Ceiling	Fudge	Score
1. Hal Crane	553.1	20.1'	1.318	728.8
2. Clarence Mather	531.0	22.3'	1.253	715.5
3. Kevin Wehner	431.4*	20.5'	1.307	563.8*
4. Fudo Takagi	445.0	22.3'	1.253	557.6
5. Alan Riches	422.2	20.2'	1.314	554.8
6. Bill Langley	418.0	20.5'	1.307	546.3
7. Bob Platt	393.0	20.1'	1.318	518.0
8. Michael Thompson	347.0	20.0'	1.323	459.1
9. Ted Katsanis	338.0	20.0'	1.323	447.2
10. Bob Leishman	297.0	18.0'	1.394	414.0

STATE OF THE ART

Larry Calliau's "Los Angeles Leopard" won all the marbles at the Tulsa Team Finals, while the Cabin version (just add more dihedral to the wing to lose 5 sq. in. of projected area!) placed third at the '73 Nats. Larry's description of the model: "This is the 12th FAI design I've tried. After going thru a wide variety of models, I came back to a basic design and tried to refine it. I wanted a FAI ship which was simple and easy to build and repair, with no cost of flight efficiency. This ship is the compromise I came up with. It flies as well as any I've tried and is by far the easiest to build. It has less ribs, one-piece compression ribs, primary wing bracing and unbraced stab. I also was looking for a way to avoid long unsupported spars but chose to eliminate excess offset and make the inboard tip a little longer. The model was originally designed for high ceilings, but I finally found a prop/rubber combination that would hang it up in Santa Ana and still give 30 minutes from about 90'. My cabin model is identical to the FAI except for a 10" boom and 17" prop."

The CMOS chart below is for the FAI model, but will work for the cabin model. The only effect will be to give about +3% margin for the cabin model. Larry's CMOS trim was +5.2%, and INP margin was +22%.



INDOOR ELSEWHERE

**ARGENTINA - Buenos Aires**

The Argentine Indoor Nats were held Apr. 20, 1973.

1. Alberto Barilari	14:49	15:32*	30:21
2. Nereo Begliatto	14:50	14:52	29:42
3. Eduardo Grippo	13:48	14:10	27:58
4. Miguel Leone	10:03	14:10	24:13
5. Domingo Sassone	12:05	10:55	23:00
6. Marcos Molo	5:37	2:54	8:31

**HUNGARY - Debrecen**

The Fourth Annual Hadju-Cup Contest was held Aug. 17-19, at Kossuth University in Debrecen. 24 entries from five countries, including a 3-man team from Bulgaria, flew in good site conditions. The site is an almost perfect 30 meter cube, with a slightly curved ceiling of stained glass which virtually assures that ceiling scrubbing will result in hangup on the walls.

1. E. Ciapala	Poland	33:34*	31:44	65:18
2. A. Popa	Romania	29:15	31:41	60:56
3. E. Chlubny	Czech.	30:00	30:26	60:26
4. A. Ree	Hungary	30:14	29:53	60:07
5. A. Pospichal	Czech.	28:53	29:06	57:59
6. G. Buzady	Hungary	28:37	28:40	57:17
7. J. Hrdlicka	Czech.	28:00	28:41	56:41
8. O. Hints	Romania	26:39	28:21	55:00
9. S. Kujawa	Poland	26:57	27:28	54:25
10. A. Egri	Hungary	25:34	27:21	52:55

\*Ciapala's flight is an absolute flight for the site, as well as a new Polish national record.

One sad note from Hungary - Geza Varaszegi, past member of Hungarian teams to 3 WCh's, and well known to many fliers in Europe, died at age 70. He will be missed by many people all over the world who knew him.

**POLAND - Wroclaw**

The Polish Indoor Nats were held in Wroclaw Oct. 7, 1973.

1. E. Ciapala	Slaski	22:49	27:35	50:34
2. R. Czechowski	Krakow	22:53	26:02	48:55
3. S. Kujawa	Poznan	24:10	24:35	48:45
4. S. Bombol	Wroclaw	20:44	24:05	44:49
5. J. Kapusniak	Bydgoszcz	21:30	22:57	44:27
6. S. Zurad	Wroclaw	21:45	20:49	42:34
7. S. Sierko	Bydgoszcz	18:17	19:17	37:34

**CZECHOSLOVAKIA - Brno**

The Czech team for 1974 was chosen from the results of three meets held in Z Hall in Brno. The Team will consist of Karol Rybecky, Jiri Kalina and Eduard Chlubny, with J. Jirasky as alternate.

National meet, June 30, 1973

1. K. Rybecky	31:58	31:15	63:13
2. J. Kalina	29:17	28:43	58:00
3. E. Chlubny	26:09	26:37	52:46
4. Pospichal	21:46	25:31	47:17
5. Koutny	27:42	19:26	47:08

International Meet, July 14-15, 1973

1. E. Ciapala	Poland	32:42	30:54	63:16
2. K. Rybecky	Czech	31:28	29:14	60:42
3. Sora	Romania	27:32	28:14	55:46
4. A. Popa	Romania	26:55	28:41	55:36
5. J. Kalina	Czech	29:57	24:42	54:39
6. E. Chlubny	Czech	26:40	27:54	54:34
7. Koutny	Czech	27:42	25:50	53:32
8. Donia	Romania	26:10	27:03	53:13
9. Czechowski	Poland	26:28	25:26	51:34
10. Pospichal	Czech	22:36	24:28	47:04
11. Holtier	Romania	24:44	22:07	46:51

National Meet, Nov. 10-11, 1973 (poor conditions)

1. J. Jirasky	25:53	32:30	58:23
2. R. Cerny	21:25	29:15	50:40
3. Hrdlicka	22:06	22:55	45:01
4. Sedlar	25:16	18:43	43:59
5. Kalina	26:46	16:34	43:20

CONTEST RESULTS

**CANADA - Port Coquitlam, B.C.**

Fall Indoor Meet, Oct. 21, 1973, PNE Agrodome 90'

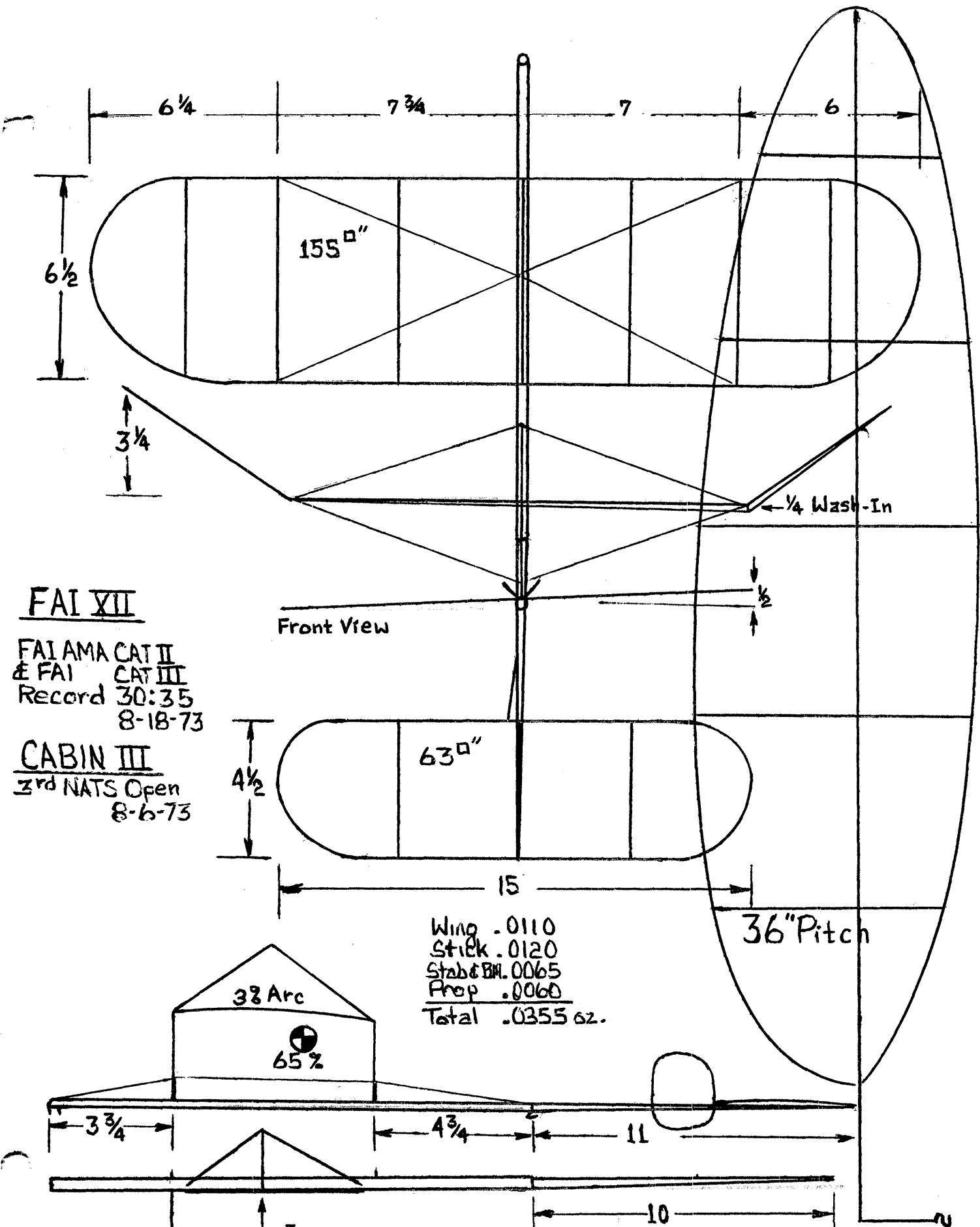
FAI Stick

1. Phil Walden	15:13.6
2. Bruce Matthews	12:49.2
3. Walt Windberg	12:45.6

PennyPlane

1. Pete Frattinger	6:10.6
2. Bruce Matthews	5:25.0
3. Dave Van Dieren	2:54.4





FAI VII

FAIAMA CAT II  
 & FAI CAT III  
 Record 30:35  
 8-18-73

CABIN III  
 3rd NATS Open  
 8-6-73

Front View

Wing .0110  
 Stick .0120  
 Stab & BA .0065  
 Prop .0060  
 Total .0355 oz.

Cabin 2 3/4 Box  
 Add More Dihedral For 150" Cabin Wing

Los Angeles Leopard  
 By Larry Cailliau

Indoor Scale

1. Walt Windberg 174.8
2. Dennis McLellan 120.6
3. Dave Van Dieren 106.65

HLG

1. Rick Lim 93.8
2. Bruce Matthews 89.2
3. Phil Walden 86.6

ILLINOIS - Chicago

Chicago Aeronauts Indoor Contest - Nov. 4, 1973  
 Brig. Gen. R. L. Jones Armory, 90' ceiling

Junior HLG

1. Mario Moranetz 36.3
2. James Mackey 11.2
3. Jim Loribecki 6.0

Senior HLG

1. Bob Hayes, Jr. 129.9
2. Keith Gordey 95.2
3. Kurt Burg 56.6
4. Tom Grabera 46.1

Open HLG

1. Chuck Markos 127.5
2. Bob Watson 118.5
3. Dick Swenson 104.5
4. John Jensen 102.7
5. Phil Sullivan 102.1

Junior PennyPlane

1. Dan Brown 8:33.5
2. Tim Noonan 6:41.0
3. Mindi Linstrum 5:12.0
4. Jim Loribecki 4:25.0
5. Bill Black 4:25.0

Senior PennyPlane

1. John Loribecki 5:52.0
2. Keith Gordey 5:14.7
3. Kurt Burg 3:27.0

Open PennyPlane

1. Hank DeKat 9:02.5
2. Bob Hayes, Sr. 8:57.0
3. Steve Brown 8:34.0
4. Howard Haupt 7:21.0
5. Jim Harte 6:54.8

Junior Paper Stick

1. Bill Black 5:35.1
2. Jim Loribecki 5:05.0
3. Carl Linstrum 1:51.8

Senior Paper Stick

1. Keith Gordey 8:43.1
2. Kurt Burg 7:43.0
3. John Loribecki 4:38.0

Open Paper Stick

1. Gordon Wisniewski 15:51.0
2. Charlie Sotich 14:51.0
3. Chuck Markos 14:48.0
4. Howard Haupt 11:09.0
5. George Bucic, Sr. 8:40.6

A 10:1 INDOOR WINDER

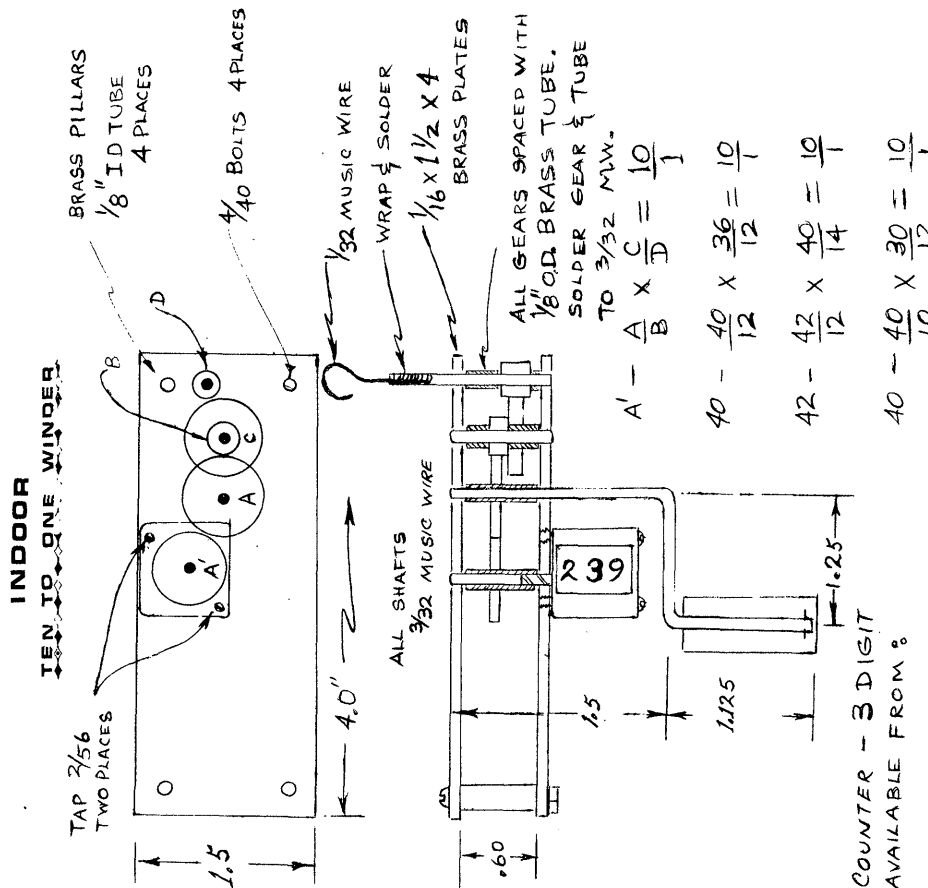
by Dennis Jaecks

Study the drawings carefully to become familiar with the design and construction, then study these notes for further hints.

1. Select the parts to be used. Gears are available with either 5-40 thread or 1/8" ID posilock; both work well.

1. Pinions are all 3/32" ID press fit (drill out 5-40 threads).
2. Tape the brass plate sides tightly together to drill holes for the corner spacers. After drilling, bolt the sides together temporarily.
3. Drill the hole for the output gear shaft (3/32" dia.) - location is not critical.
4. Make up a 3/32" music wire centerpunch. Slide punch thru 1/8" brass tubing and gear "C". Line up spacing with pinion "D"; punch & drill hole.
5. Temporarily mount pinion "C", locate & drill hole for gear "A".
6. Locate & drill hole for gear "A".
7. Separate brass plates and check gear spacing by temporarily installing gears and shafts.
8. Carefully check to get the proper side, then drill 1/4" hole for the counter shaft.
9. Make up 4 brass pillars .6" long x 1/8" ID.
10. Assemble winder and check alignment.
11. Remove two case screws from the counter and drill the frame to clear 2/56 bolts. Tap the counter 2/56 to proper spacing and mount counter.
12. Cut 1/8" OD brass tubing spacers to hold the gears in proper alignment; install on shafts.
13. Make crank with wood or teflon handle; solder washers to hold handle in place.
14. Check all parts for fit and alignment, then solder parts together using acid core solder. Clean parts thoroughly and oil.
15. A thrust washer on the output shaft is optional; if used, install it now.
16. Add 1/32" music wire hook; shape to suit and polish whole hook thoroughly.

The winder plus counter is a must for serious flying. This design has two minor drawbacks; the counter must be zeroed by cranking, and you must remember when the number of turns exceeds 1000 or 2000.



$$A' - \frac{A}{B} \times \frac{C}{D} = \frac{10}{1}$$

$$40 - \frac{40}{12} \times \frac{36}{12} = \frac{10}{1}$$

$$42 - \frac{42}{12} \times \frac{40}{14} = \frac{10}{1}$$

$$40 - \frac{40}{10} \times \frac{30}{12} = \frac{10}{1}$$

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