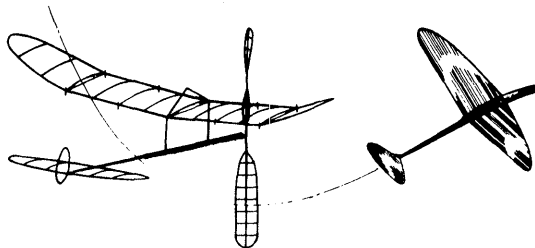


# INDOOR

## NEWS and VIEWS

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



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

#### New Members!

CECIL DAVIS, Jr., 6624 W. 72 Terr., Overland Pk. KS 66204  
KEITH GORDEY, 2901 Prairie Dr., Brookfield IL 60513  
HARVEY K. LICKSTEIN, 1252 Magee Ave., Philadelphia PA 19111

#### Recent Publications

FAT CAT IV, by Bob Randolph, is the story of Bob's cabin model which holds or has held all three Open Cabin records, plus being the first cabin model to reach 30:00. The article appears in the Feb.'74 MAN, and continues a pattern of indoor recognition by that magazine which has not been equalled by any other magazine. Thanks to Bob and MAN!

#### Indoor Sites

A hobby sideline enjoyed by several NIMAS members is to note various buildings and structures around the U.S. that might be suitable for indoor flying. In recent months, several people including indoor pioneer Bill Tyler have noted that the big Goodyear Aerospace airdock, near Akron, Ohio is being put up for sale. This site, with its 185' inside height, was the site of the 1934 Nats where Carl Goldberg's landmark 22:59 flight was made.

Ed Whitten has noted two such sites - the new sports dome near New Orleans, La., and the Savannah, Ga. Civic Center Auditorium. Both these sites are worthy of investigation - there is a shortage of sites in the South!

#### FAI INDOOR REPORT

##### Council Decision Deferred

A rising note of concern, sounded by both FAI fliers and Executive Council members, has resulted in a decision to wait until the March 9 Executive Council meeting to complete discussion of authority to be granted to Frank Ehling. He was appointed as chief FAI administrator at the '73 Nats Council meeting. Since then, efforts have been under way to define exactly his duties and authority. Considerable background on this matter appears in the past two issues of INAV, and those who have an opinion on what should be done should contact the AMA VP for your own AMA district. Do this well before March 9, 1974!

#### The Team Concept

Many of Europe's finest indoor fliers do most of their flying as part of a team, with a team representing their country at international meets all year. In contrast, U.S. team members fly together as a team only once - at one WCH - and may never have met until they assemble for their trek to the WCH.

Is it possible - and worth the trouble - to restructure U.S. team selection programs to cause most or all of the competition to take place in the context of rival team activity? This might be difficult for some areas in Indoor, but most areas of FAI FF activity have enough fliers to permit formation of teams.

As background to this idea, the Aug. '73 INAV aired Bill Shailor's request for both team and individual competition in FAI. The same issue had a challenge from Bud Tenny, Jim Clem and Jimmy Clem to any other team in the South. This was answered by Stan Chilton, Bob Dunham and Bobby Dunham in the next issue, and Bob Dunham offered to host a team competition with 1st place prize of \$100. So far, the required number of teams haven't entered Bob's meet, and the two teams mentioned haven't met. Even so, the team competition idea seems to be nearing its time, in the South at least.

#### NIMAS POSTAL MEET

The 9th Annual NIMAS Postal Meet will be open for entry through April 15, 1974. All flights made as part of a sanctioned indoor meet from Jan. 1 through April 15 are eligible, as are flights made in informal sessions between now and Apr. 16, provided these flights are made 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'.

PennyPlane: Chicago Aeronauts rules except ceiling contact permitted; use FAI ceiling measure.

Team Competition: Entry for three-man teams only, with one Junior minimum on team. Scoring by team total, fudged to 35'. Enter in Easy B and/or PennyPlane; times for team can also be used for individual entry if desired.

Ceiling Dodger: Any class indoor model, flown by AMA Rules except flight must not touch ceiling or obstructions. Exception: models landing on obstructions during descent 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 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 (including team entry) must be flown on a given day. Please note ceiling height for each entry, using FAI ceiling measure. Ceiling height is used to compute fudge factors (see below) to equalize ceiling heights. Separate classes for Juniors in each event, with awards for high placing Seniors. Anyone may enter. Send entries to Box 545, Richardson TX 75080.

#### RECORDS? MAYBE!

Thermal Thumbers Record Trials, Dec. 22-23, 1973 Cat. III  
Santa Ana MCAF, California  
Junior Paper Stick - 13:52.4, Ken Bauer  
Junior Ornithopter - 0:16.5, Ken Bauer  
Junior HLG - 2:04.5, Ken Bauer  
LIAMAC Indoor Record Trials, Dec. 29, 1973, Cat. I  
Junior ROG Cabin - 4:32.4, Richard Whitten  
Senior A ROG - 4:44.8, Ronnie Stransky

#### CONTEST CALENDAR

##### POSTAL MEET - U.S.A.

Midwinter Iceburg Junior Contest, Jan. & Feb. '74.  
HLG, A ROG, Indoor Stick; for fliers thru age 15. Write Richard Whitten, P O Box 176, Wall St. Station, New York NY 10005 for details.

##### CONNECTICUT - Glastonbury

Indoor sessions Jan. 30, Feb. 26, Mar. 12, Apr. 2, May 7 and June 4, 1974, 7 pm to 9:30 pm. Also on Sundays Jan. 20, Feb. 17, Mar. 17, Apr. 21 and May 12, 1974, 8 am to noon. Sessions at Glastonbury High Gym. Contact George Armstead, 89 Harvest Lane, Glastonbury CT 06037.

##### FLORIDA - Miami

Indoor contest at Goodyear Blimp Base, Opa Locka Airport, Jan. 20, 1974. Contact Br. John Martin, 3227 Darwin St., Miami FL 33133.

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

Indoor sessions at DuPont Gynnasium, Vassar St. and Mass. Ave., Cambridge Mass. (use Vassar St. entrance). Jan. 30, Feb. 26, Mar. 12, 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.

##### ILLINOIS - Chicago

Indoor contest Jan. 19, 1974, 9 am to 4 pm, at Madison St. Armory, 2653 Madison St., Chicago. Paper Stick and Indoor Stick. Pete Sotich, 3851 W. 62nd Place, Chicago IL 60629. Same site is available for indoor sessions each Sunday thru Apr. 28 except for Jan. 27, Apr. 14, Apr. 21, 1974 from 9 am to 4 pm.

##### MISSOURI - Kansas City Area

Two contests are planned in the KC area this winter.

with Indoor Scale and beginner events tentatively planned for February. Easy B and Open Stick will probably follow in March. Special awards for the best constructed scale model and the highest "no touch" Indoor Stick time. Contact Roger Schroeder, 4111 W. 98th St., Shawnee Mission KS 66207.

**NEW JERSEY - Union**

Indoor sessions at Livingston School on Midland Ave., Union NJ, 7 pm to 10 pm, Feb. 14, Mar. 14, Apr. 4 and May 9, 1974. Sponsored by Union MAC; contact Dan Domina, 1229 S. Long Ave., Hillside NJ 07205.

**NEW JERSEY - Lakehurst**

Second Annual East Coast Indoor Contest, July 21, 1974 at Lakehurst NAS. Indoor Stick, Easy B, HLG, Peanut Scale and PennyPlane. Sal Cannizzo, 20 Outerbridge Ave., Staten Island NY 10309.

**NEW YORK - Long Island**

Cat. I Record Trials at Boy's Gym of Friends Academy, Locust Valley, L.I., NY on Mar. 23, 1974, 11 am to 5 pm. Gym shoes required. Site is approx. 60' x 72', with shallow peaked roof, max height approx. 33'. Contact J. G. Pallet, 30 Emerson Rd., Brookville, Glen Head NY 11545

**PENNSYLVANIA - Philadelphia area**

Indoor contests in Bridesburg Rec Center, Richmond & Ash St., Philadelphia. Jan. 20, Mar. 17: HLG, Indoor Scale, "B" Stick; Feb. 17: HLG, Peanut Scale, "B" Stick. Contact Charles Stiles, IRC Co., Div. TRW, 6th Flr. R&D, 401 N. Broad St., Philadelphia PA 19108.

**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.

STATE OF THE ART

Dennis Jaecks won PennyPlane at the Nats for three years straight. His '71 winner was presented in the Dec. '71 INAV; it had a 6" chord. He won in 1972 with an 8" chord model quite similar to the one presented here, except for a smaller stab. His comments on this model are: "This version with the increased stab area is much better than my '72 design. I think a wing with 6% arc should be used for medium low ceiling, and anytime the model climbs as much as it did at the '73 Nats."

Several things should be noted on the plan. First, Dennis has firmly settled for +4% margin for PennyPlane (CMOS balance method; see Jan. '73 INAV). However, he has presented a formula on the plan which replaces the usual chart. Instructions for the formula: Balance the model completely assembled except for wing (motor installed) and measure "B". Calculate "A" according to the formula and install the rear socket. Wing washin/washout is made by skewing the wing posts. Note also that part of the trim is left thrust and downthrust. Finally, note that Dennis' original concept of building a light model and adding ballast was carried out here.

TRIPLE-WHAMMY FOR RUBBER!

Between the chart below and the two on page 4, all you need to know is right at your fingertips - except for the quality of your rubber. All the charts are based on data worked up by Charlie Sotich; the Rubber Weight chart was prepared by Dennis Jaecks from Charlie's data, and Charlie designed the other charts.

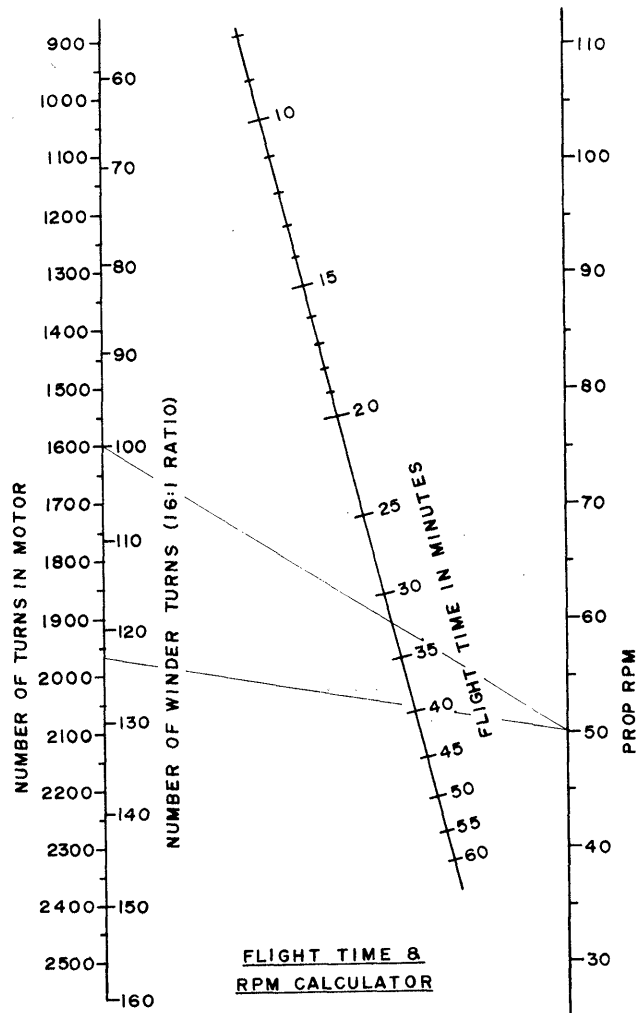
To use the Triple-Whammy, begin with model weight and multiply by 1.2; convert to ounces if model weight was in grams. Select a loop length (for new rubber) 15% longer than the hook distance on your model. With the weight and loop length known, draw a straight line between these two quantities on the Rubber Weight chart; the line will intersect the Thickness (strip width) line to give rubber size. From Pirelli Parameters, note the turns/inch and go to the Flight Time/RPM chart below. Multiply the loop length x turns/inch (this is max turns); draw a line from max turns to the average RPM performance of your model. This line will intersect the Flight Time line at some number of minutes which represent the flight time in an unlimited ceiling on a flight that uses 100% of the turns.

Now come the fudge factors! A time-proven rule-of-thumb for rubber usage is that a well-adjusted model with properly chosen rubber will land with about 10% of take-off turns. Leave about 5% margin in max turns for winding safety - unless you have to go-for-broke. In that case, have spare motors in hand when you call for a timer! In less than unlimited ceilings, max turns will also result in too much take-off torque.

The problem of excess launch torque must be dealt with by experimentation, after a preliminary test session using motors chosen from chart-aided guesses. Note the launch torque and altitude and double-check average RPM (turns used divided by flight time). For every launch, wind to nearly max turns, then back off turns to the desired level of torque. For a given rubber weight in stable air with no inversion layer, small changes in launch torque will give approximately proportional changes in altitude.

To put it all together, let's assume a 15" hook length on a model weighing .035 oz., which has a 50 RPM average on the day in question.  $1.15 \times 15" = 17\frac{1}{2}"$ ;  $1.2 \times .035 = .042$  oz. On the Rubber Weight chart, this line falls almost on .050" rubber. From Pirelli Parameters, .050 rubber gives 132 turns/inch.  $17\frac{1}{2} \times 132 = 2320$  turns max. Allow 5% for winding safety and 10% turns left;  $.85 \times 2320 = 1970$  turns. From the Flight Time chart, 1970 turns and 50 RPM average = almost 40 minutes (unlimited ceiling). Using the max torque/launch torque ratios I used at Tulsa, we could assume that after winding to 1970 turns, it would be necessary to back off to 1600 turns to avoid ramming the ceiling too hard. From the same chart, 1600 t. @ 50 RPM ave. would give about 32 minutes - almost in line with Team Finals results. Since my model was overweight and out of trim, it presumably needed a higher torque ratio than a well-trimmed one gram model, which would account for the inflated duration prediction.

Refer again to Pirelli Parameters. That same piece of .050 pirelli indicates (bottom line) relative torque of 3. This information is useful mainly in choosing new sizes of rubber if the model deadsticks (loop too short or strip too wide), or if it lands with too many turns (loop too long or strip too narrow). If a change is made from .050 pirelli to .055 - 10% larger - the relative torque changes by 5/30 or 16.6%. There are two possibilities for the new loop - same length or same weight. With a  $17\frac{1}{2}"$  loop, the weight increases by 8.3% and turns decrease by 5%. With the same weight, the length decreases to  $16\frac{1}{2}"$  and max turns decrease to 2080 or down 10%. Thus, with experience it is possible to quickly pinpoint needed changes in rubber size to match a given model to the flying site.



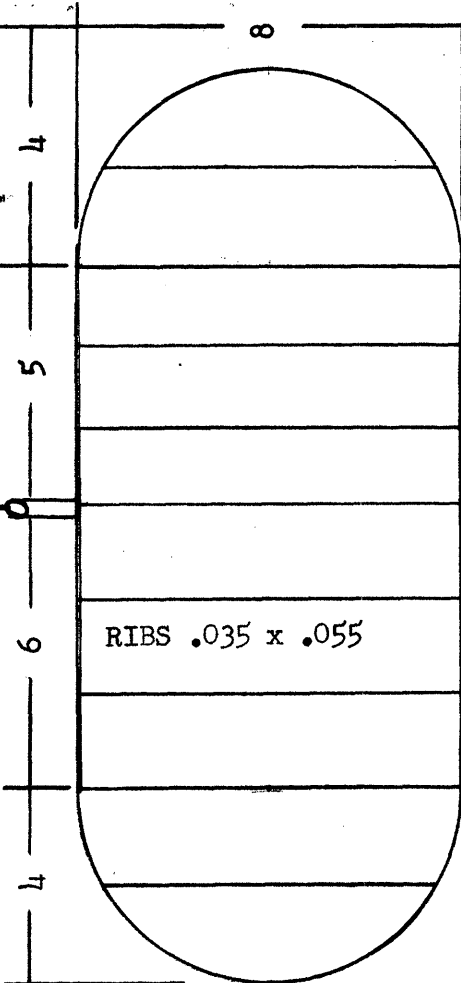
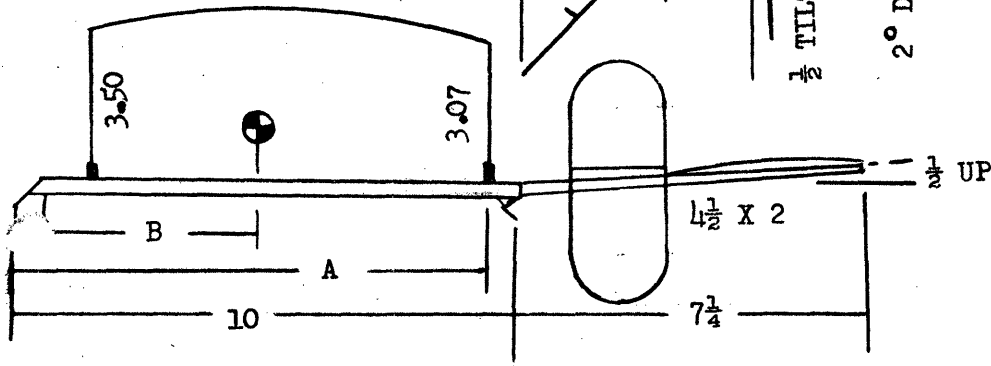
PENNY PLANE

BODY & TAIL - .34 p  
 WING - .36 p  
 PROP - .25 p  
 NOSE WT. - .05 p

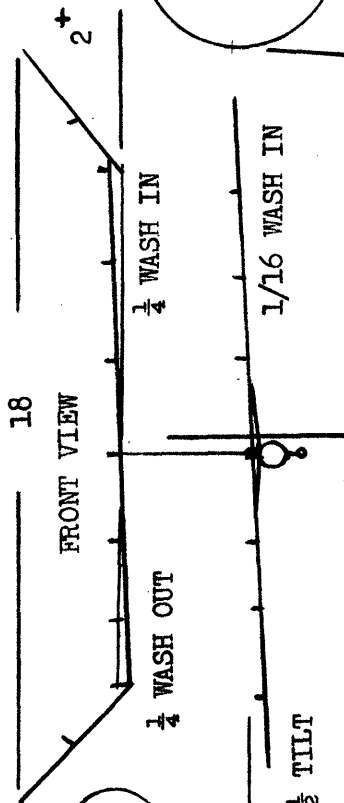
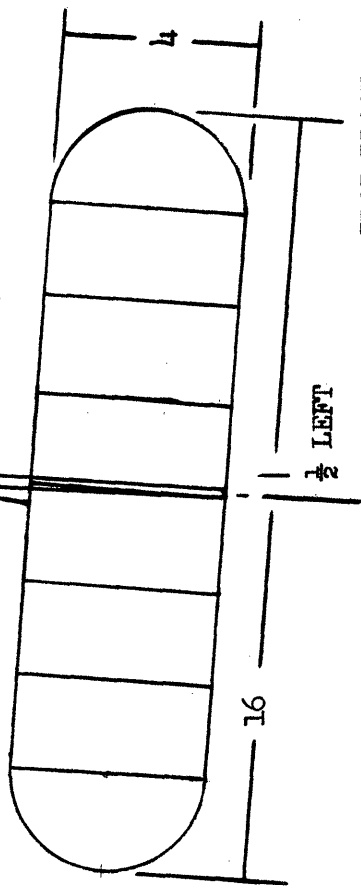
POWER .100 X 18 @ .79 p - 1450 TURNS  
 TIME 12 MIN. 19 SEC. FIRST 1973 NATS

BODY .025 ROLLED ON .220 FORM  
 TAIL BOOM .015 ROLLED

CMOS (4%) A = B x 1.2 + 2.5



MICROLITE COVERING  
 AIRFOIL 4% - 25" R.A.RCH.  
 (WING & H. STAB.)



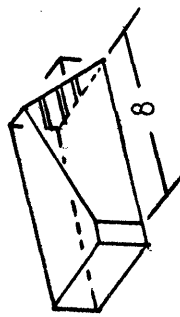
OUTLINES  
 RUDDER .040 x .040  
 STAB .040 x .050  
 LE & TE .055 x .080  
 TIPS .040 x .055

THRUST  
 2° DOWN & LEFT

1/2 TILT

PROP BLOCK

3 x 1 3/4 x 10



PROP HUB: SIX TURN TISSUE TUBE 3/32 ID x 1  
 3/32 BOUND SPAR WITH 1/4 LONG I.D. PLUG.

17 D x 27 P .025 "C" GRAIN  
 WARP ON PROP BLOCK

NOTE: SKEW WING POSTS TO OBTAIN  
 WASH IN & WASH OUT.

SLOT PROP BLADE TO ACCEPT SPAR.

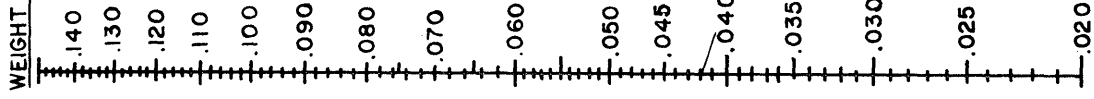


.015 M.W.

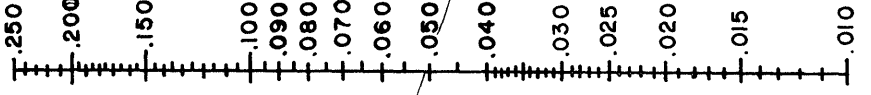
# RUBBER WEIGHT FOR ONE LOOP

$$W = .046 T \times L$$

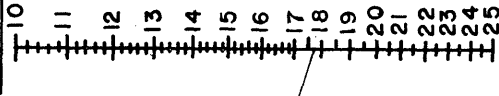
WEIGHT OUNCES



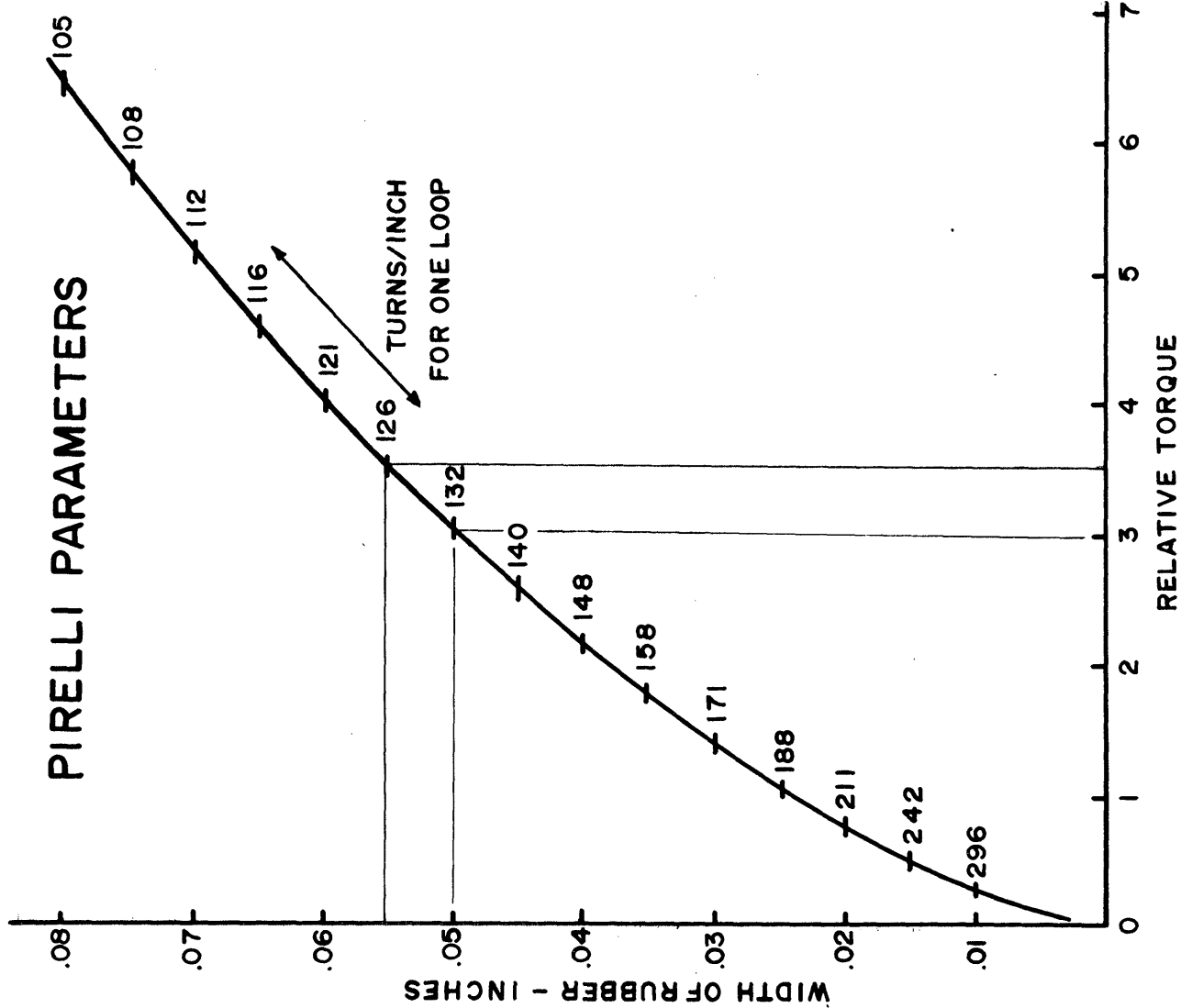
THICKNESS



LENGTH INCHES



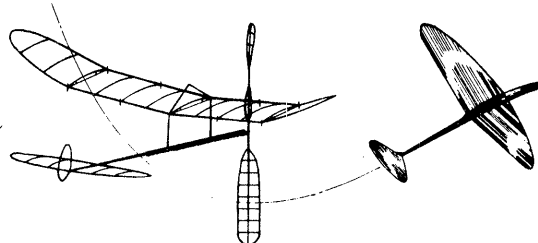
# PIRELLI PARAMETERS



# INDOOR

## NEWS and VIEWS

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



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

#### New Members!

DANA ROSS, 2426 Gower, Los Angeles CA 90068  
SCOTT SOUTHWELL, 2519 N. Brookdale Ct., Appleton WI 54911  
WALTER YEIDER, 1323 Sunset Blvd. Cody WY 82414

#### Change of Address

Dave Linstrum has moved to a sunnier clime - but he denies having cold feet! His temporary address:

Dave Linstrum  
P O Box 4850  
Jacksonville FL 32201

#### Boyd Felstead III

Boyd Felstead is in the hospital, and wished others to know why correspondence from him may be greatly delayed. It also seems likely that he will not be able to attend the '74 WCh, which is a great disappointment. He will enjoy cards and letters which can be sent to his home address:

Boyd Felstead  
10 Watson Ave.  
Wahroonga, NSW  
Australia 2076

#### New World Record

Edward Ciapala's 33:34 flight at the Aug. 17-19, 1973 Hadju Cup meet (Debrecen, Hungary) has been homologated as the new Cat. III World Record for Class Fid (Indoor).

#### Harlan's Machine Shop

Ray Harlan's latest specialty product is an aluminum thrust bearing, of the type which mounts below the motor stick. Two sizes are available, both 7/16" front to rear; one drops the thrust line .1" below the bottom of the motor stick, and the other gives .125" clearance between the shaft and stick. The major advantage of the bearings is that the clever construction allows the prop shaft to snap into place at the rear, which gives positive alignment and no possibility of becoming disengaged. Weight of the bearings is .00075 oz., and the cost is 75¢ each. Ray's address is 15 Happy Hollow Rd., Wayland MA 01778.

#### Ernie Kopecky Trophy

The East Coast Indoor Modelers Club is sponsoring an International Trophy, to be awarded for the highest individual time at the '74 Indoor WCh. Outside contributions will be accepted for this trophy which will perpetuate the memory of Ernie Kopecky and his contributions to Indoor over the years.

#### Recent Publications

The Jan. '74 MODEL BUILDER has Larry Renger's very entertaining and informative article "Boxy". The plans to this glider have appeared in INAV in the past, but Larry has added many good flying and trimming hints.

In case it has slipped past you as it did me, MODEL BUILDER is rapidly developing into an excellent magazine. The "contributors" (functionally, they serve as specialty editors) are all good writers/active modelers and all do an excellent job. The most attractive and significant single attribute of MB is the fact that each issue seems to attain a balance of coverage (of specialty interests like FP, CL, RC and Indoor) better than all the other "giants" combined.

#### '74 Nats

Apparently, the Nats is now sporting a new "handle" - the HQ bulletin carried the title "1974 National Miniature Aircraft Championships". Also new is a projected 12 day flying schedule, with two complete, two-day Indoor meets! All this is subject to AMA Executive Council approval (due during the Mar. 9, 1974 meeting at Lake Charles, La.) Anyway, pending final contract with Goodyear, the blimp hangar at Houston will be the scene of HLG, AMA Scale and

Peanut Scale on Sunday, Aug. 4; Indoor Stick, Paper Stick Indoor Cabin and FAI Stick will follow on Monday, Aug. 5.

Meanwhile, back in Lake Charles, La., the Civic Center will house the same indoor events as Monday, Aug. 5 with Easy B added, on Tuesday, Aug. 6. On Wed., Aug. 7, the Civic Center will feature HLG, AMA Scale and Peanut Scale. It is rumored that PennyPlane will also be held Aug. 7, but this was omitted from the AMA schedule, presumably because PennyPlane, if held, will again be sponsored by some NFFS-affiliated group.

Only events listed as Official Events in the Rule Book will contribute toward champs points, so presumably Indoor Champs contenders will only be able to declare 3 events as in previous years. (The rule states that not more than 1/2 the events in a category can be declared, with fractions being rounded up. Thus, previous Nats had 5 events with 3 able to be declared. With FAI Stick added, the total is 6 events, half of which can be declared.)

It is hoped that more site details will be available for future issues, but the Goodyear hangar is about 100' ceiling, and the Civic Center is about 55' high.

#### Renewal Reminder

Those subscribers who have "03" in the upper lefthand corner of the address block on this issue are due to renew after this issue. Advance renewal saves a lot of time here on "newsletter night", and is appreciated.

#### FAI INDOOR REPORT

##### World Champs Schedule

The latest word, subject to possible revision, is that "official" housing (on base, presumably) is available only for contestants and officials. The tentative schedule is:

1. Practice flying at least all day Tuesday (July 2); possibly also on Monday for early arrivals.
2. Official WCh flying on Wednesday, Thursday and Friday.
3. Indoor Banquet Friday night, including WCh awards.
4. Open international flying on Saturday and Sunday.
5. General Banquet Sunday night - windup of all activities; indoor and otherwise.

#### CONTEST CALENDAR

**CALIFORNIA - Santa Ana**  
Indoor contest Mar. 24, 1974, 10 am to 4 pm, at Santa Ana MCAF. IHLG, Paper Stick, PennyPlane. Trophies to 3rd place. Test flying at Santa Ana Feb. 17 and Mar. 23. Bob Gibbs, 161 Larkwood Circle, San Ramon CA 94583

**CANADA - British Columbia**  
Indoor contests (FAI Cat. III) at the PNE Agrodome, Port Coquitlam, B.C., Scale, HLG, PennyPlane, FAI Stick, Mar. 10, May 5, June 9, 1974. Alan Riches, 1568 Celeste Crescent, Port Coquitlam, B.C., Canada V3C 1E2.

**CONNECTICUT - Glastonbury**  
Indoor sessions Feb. 26, Mar. 12, Apr. 2, May 7 and June 4, 1974, 7 pm to 9:30 pm. Also on Sundays Feb. 17, Mar. 17, Apr. 21 and May 12, 1974, 8 am to noon. Sessions at Glastonbury High Gym. Contact George Armstead, 89 Harvest Lane, Glastonbury CT 06037

**FLORIDA - Miami**  
Indoor contests at the Goodyear Blimp Base, Opa Locka Airport, 9 am to 5 pm, Feb. 17, Mar. 17, Apr. 21 and May 26, 1974. Indoor "Fly In" at JFK Gym, Miami Dade North, 9 am to 1 pm, Mar. 3, Apr. 7 and May 5, 1974. Contact Dr. John Martin, 3227 Darwin St., Miami FL 33133.

**MASSACHUSETTS - M.I.T.**  
Indoor sessions at DuPont Gymnasium, Vassar St. and Mass. Ave., Cambridge, Mass. (use Vassar St. entrance). Mar. 9 and Apr. 6, 1974, 3 pm to 6 pm. Indoor contest on May 4, 1974; Indoor Stick, HLG, Indoor Scale, Peanut Scale, PennyPlane and Delta Dart. Contact Ray Harlan, 15 Happy Hollow Rd., Wayland MA 01778.

## ILLINOIS - Chicago

Indoor sessions at Forest View High School Girl's Gym, Arlington Hts. IL, each Sunday thru Apr. 28, 1974, except for Apr. 14 and Apr. 21, 9 am to 5 pm. Possible sessions at Madison St. Armory, 2653 Madison St., Chicago. Contact Pete Botich, 3851 W. 62nd Place, Chicago IL 60629 for the dates.

## MISSOURI - Kansas City Area

Two contests are planned for the KC area this winter, with Indoor Scale and beginner events tentatively planned for February. Easy B and Indoor Stick will follow in March. Special awards for the best constructed scale model and the highest "no touch" Indoor Stick time. Contact Roger Schroeder, 4111 W. 98th St., Shawnee Mission KS 66207.

## NEW JERSEY - Lakehurst

Tentative dates at Lakehurst: Apr. 21, May 19 and June 16, 1974. Contest July 21, 1974, with Indoor Stick, Easy B, HLG, Peanut Scale and PennyPlane. Contact Sal Cannizzo, 20 Outerbridge Rd., Staten Island NY 10309.

## NEW JERSEY - Union

Indoor sessions sponsored by Union MAC; held at Livingston School on Midland Ave., Union NJ, 7 pm to 10 pm, Mar. 14, Apr. 4 and May 9, 1974. Contact Dan Domina, 1229 S. Long Ave., Hillside NJ 07205.

## NEW YORK - Long Island

Cat. I Record Trials at Boy's Gym of Friends Academy, Locust Valley, L. I., NY on Mar. 23, 1974, 11 am to 5 pm. Gym shoes required. Site is approx. 60' x 72', with shallow peaked roof, max height approx 33'. Contact J. G. Paillet, 30 Emerson Rd., Brookville, Glen Head NY 11545.

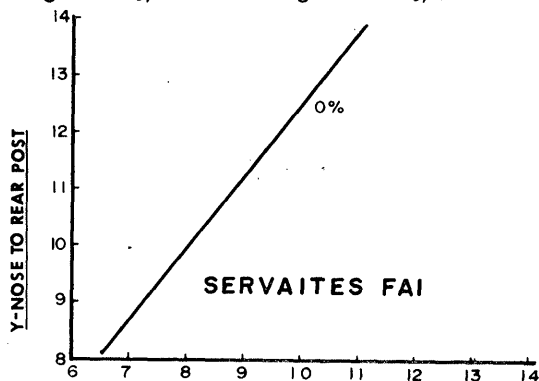
## PENNSYLVANIA - Philadelphia

Indoor contest in Bridesburg Rec Center, Richmond & Ash St., Philadelphia, Mar. 17, 1974. HLG, Indoor Scale, "B" Stick. Contact Charles Stiles, IRC Co., Div. TRW, 6th Flr. R&D, 401 N. Broad St., Philadelphia PA 19108.

### STATE OF THE ART

Bucky Servaites won a berth on the 1974 U.S. Indoor with the model design presented this month. Although he showed no name on the drawing, his remarks suggest a name: "The model could be called Copy Cat since I copied various other ships for its composition. The wing and stab outlines are from Joe Bilgri (Feb. '72 INAV). The rudder and wire front end assembly are those of Jim Richmond, and the prop outline is that of Pete Andrews (Feb. '73 INAV). The prop has a good amount of flex. The wire front end is a little more difficult to construct than the conventional dural type, but I believe it is lighter and much stronger."

Bucky's balance scheme resulted in the model's having CMOS margin of +3% and INP margin of 12.5%.

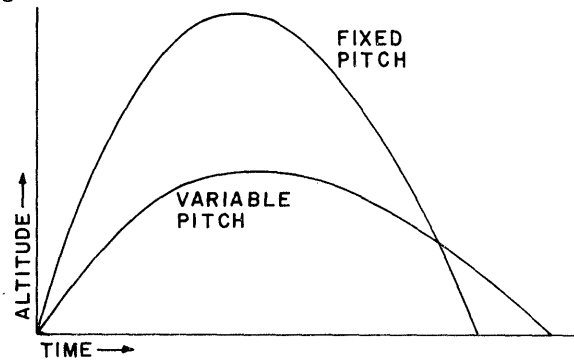


### DESIGN FOOTNOTES

Jeff Annis designed a prototype of the torque variable prop shown on page 4 as a college engineering project. The version shown is a working model PennyPlane prop which enabled him to get 5:22 with no touch (max altitude 20') with his PennyPlane. Perhaps someone else has similar performance, but personal experience leads me to believe this is unusual time for the altitude.

The basic effect of such a prop is illustrated in the sketch below, and is exactly what one would expect from this type of device. That is, the full-torque climb rate is slowed, which increases the time required to reach level flight torque. Then, due to somewhat lower RPM in level flight (with proper adjustment), level flight time is also increased. Let-down may also be slowed a bit, so long as the minimum pitch setting is not too low and if the rubber cross section is high enough to keep torque

high until touchdown.



Details of the prop are pretty clear in the drawing, but here is how it works:

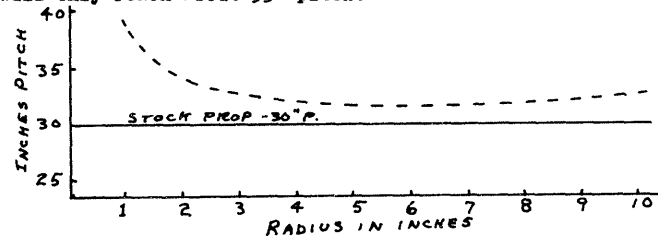
1. The prop shaft (#6) is glued to a torque bar (#7) via a square bend in the shaft. The shaft then extends to the prop itself in the usual fashion.
2. The prop blades fit into a socket just large enough to give free rotation. Two prop levers (#5) fasten to the prop blades (don't make permanent attachment until flight tests at low power show proper and equal pitch in the blades) and change the pitch when the torque bar pushes against the prop levers.
4. Items #4 are stops which keep the assembly all together; these must be far enough from the prop lever so that they never restrict torque bar movement at maximum torque. Items #3 are wire clips to prevent the prop blades from feathering in case of collision with an obstacle.
5. Under full torque, the part of the prop shaft between the torque bar and the prop hub twists, due to the drag of the blades. This movement increases the pitch of the blades by an amount determined by the strength of the shaft and the geometry of the mechanism as outlined below.
6. As torque reduces, the blade angle also reduces to yield more nearly constant RPM.

Jeff's approximation of the angular change caused by a particular configuration is this formula:

$$\theta = \frac{T \times L}{k \times G}$$

where  $\theta$  is the angular twist in radians,  $T$  is the maximum torque of the motor,  $L$  is length "A" on the drawing,  $G$  is the modulus of shear for music wire (11,500,000 PSI), and  $k = 1/2 \times \pi \times r^4$  ( $r = "B"$  on drawing).

Note also that small changes in angle will go a long way, as shown in the sketch below. This graph shows that for 2° (.035 radians) increase in angle, a 30" pitch prop increases to about 32" pitch over most of the blade and to nearly 40" pitch at 1" radius. Since the hub mechanism takes up a lot of hub area, the inboard end of the blade will only reach about 35" pitch.

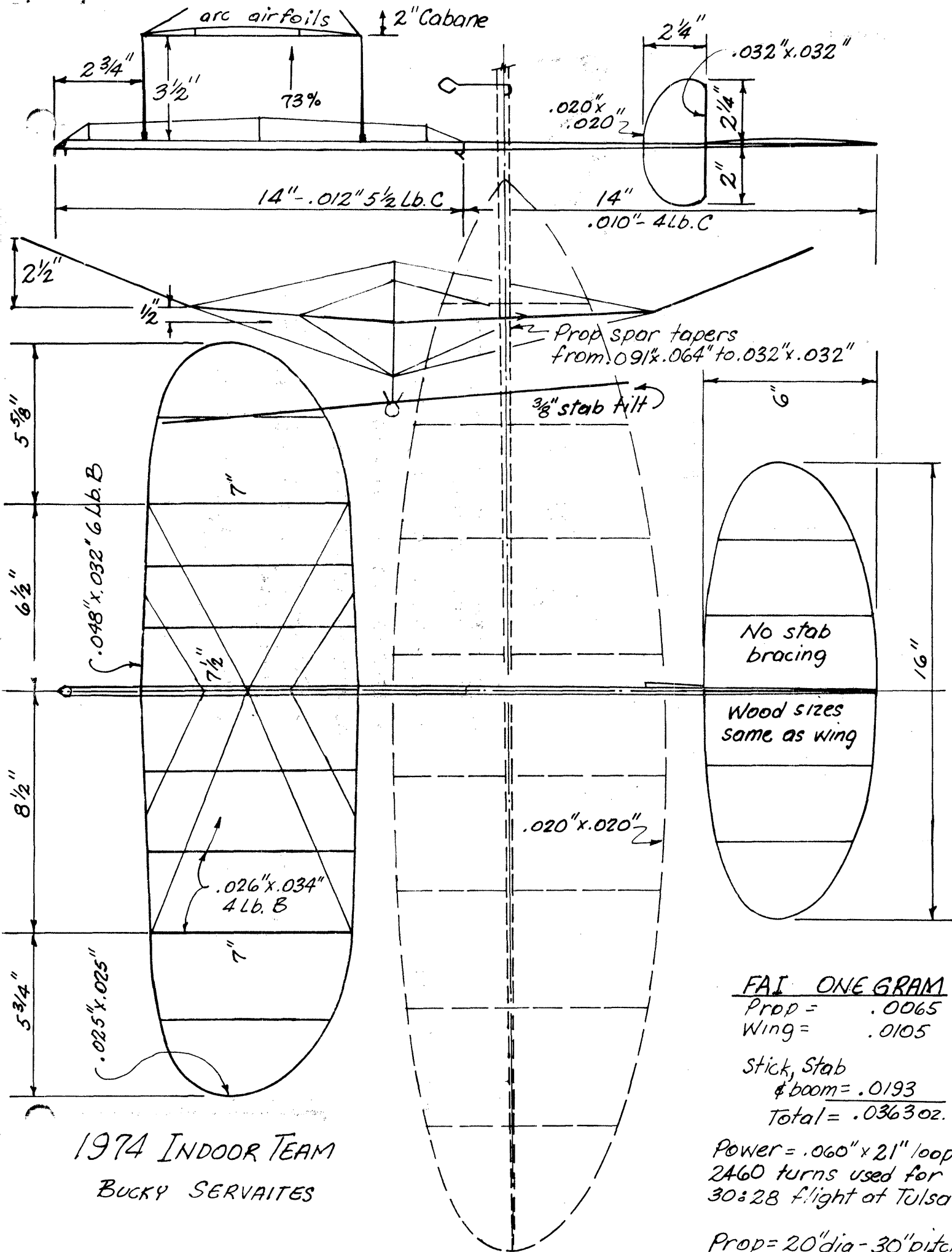


### PENNYPLANE HINTS

As promised, this column is now open with hints from Dennis Jaacks, three-time winner of PennyPlane at the Nats ('71, '72, '73). Whether or not you are a big winner, if you have an unusual model, or a different technique for building, trimming or flying that you wish to share, send the information to Bud Tenny, Box 545, Richardson TX 75080. If possible, drawings should be high-contrast (ink if possible), but sketches are still welcome. The important thing is to share the idea!

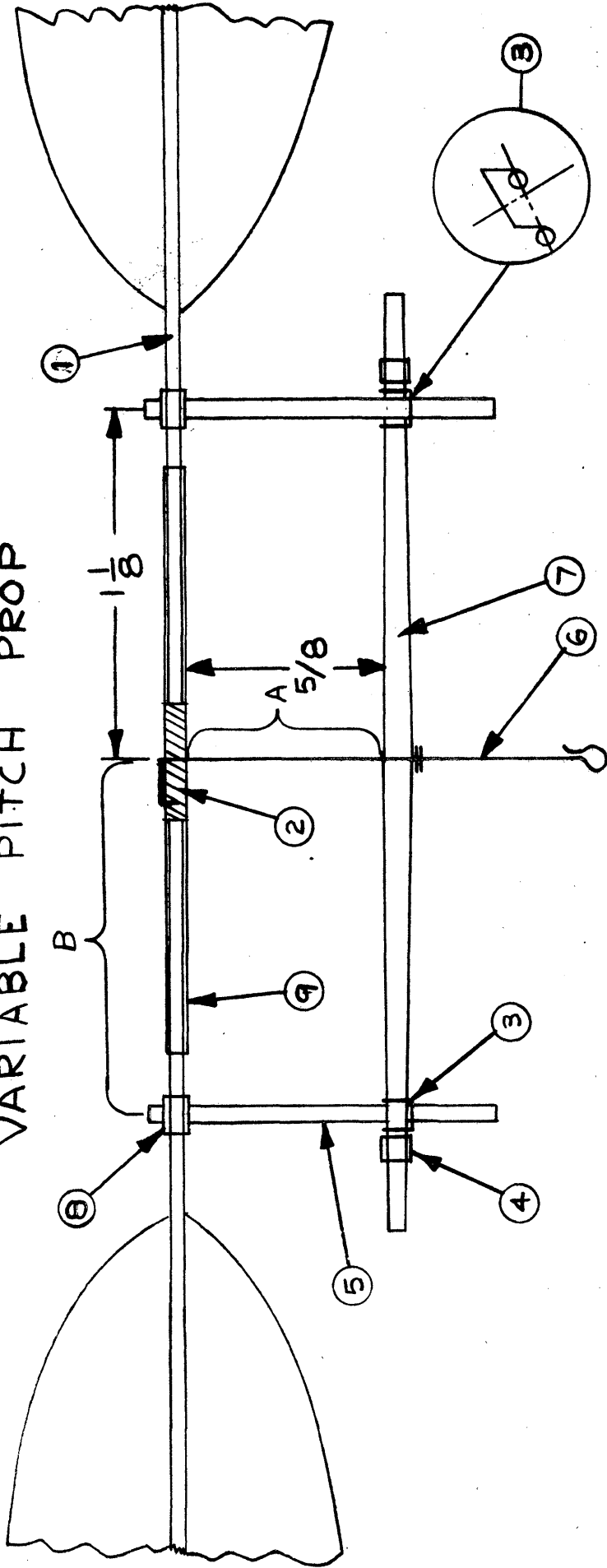
### PennyPlane Construction

1. When rolling P/P motor sticks, much heavier wood is needed than for microfilm models. Typical is .025" wood, which should be rolled with silkspan instead of tissue.
2. Coat the finished motorstick with thinned dope or microfilm solution to improve strength and reduce absorption of lube and moisture.
3. Make dual bearing from .015" music wire. Practice with soft wire first to get the hang of size and shape.



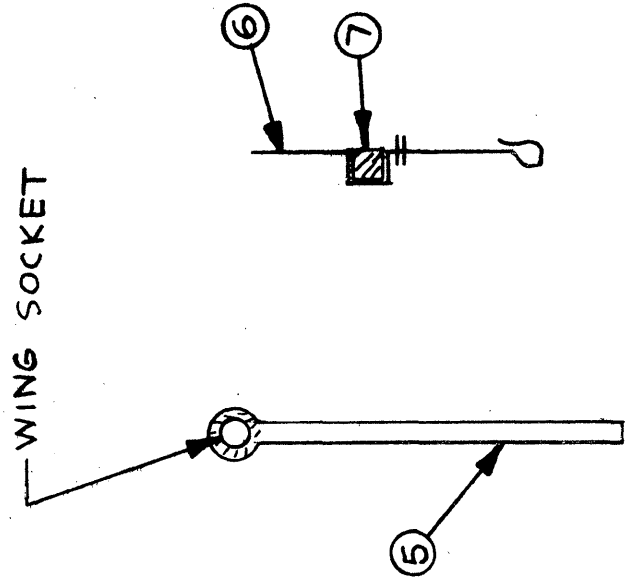
1974 INDOOR TEAM  
 BUCKY SERVAITES

# VARIABLE PITCH PROP



1. PROP SPAR - 3/32 DIA., GLUE SKIN FOR PART INSIDE BEARING
2. BALSA HUB - 3/32 DIA., 1/2 LONG
3. WIRE BRACKET - .008 WIRE
4. WING SOCKET - 1/16 I.D.
5. PROP LEVER - 1" LONG, 1/16 ROUND, GLUE SKIN FOR PART IN CONTACT WITH TORQUE BAR.
6. .015 SHAFT - SQ. BEND & GLUED TO TORQUE BAR (#7)
7. TORQUE BAR - 3" LONG, 3/32 SQ.-1/16 DIA.
8. WING SOCKET - 3/32 DIA.
9. HUB - TISSUE SOCKET, 3/32 I.D., 1 7/8 LONG

WING SOCKET



DESIGNED AND  
DRAWN BY

*Jeff Amie*



# INDOOR

## NEWS and VIEWS

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

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

### New Members!

TOM DEAN, 7125 Southaven, Corpus Christi, Texas

### Change of Address

DAN DOMINA, 47-01 Fox Run Dr., Plainsboro NJ 08536

### Oops!

In Jeff Annis's torque-variable prop article, the symbol for PI was left out of the formula for k. It should have read:  $k = 1/2 \times \pi \times r^4$ . Also, r = radius of the music wire prop shaft. Jeff also furnished a mathematical development and a sample calculation. To save space, those who wish to obtain a copy of Jeff's comments may do so by furnishing a stamped, self addressed envelope with their request.

### Postal Reminder

Some entries are already in for the 9th Annual NIMAS Postal Meet, and entries will be accepted (postmark) until April 20, 1974 on meets or sessions thru April 16, 1974.

### 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

Use straight-line interpolation for ceilings between listings; convert inches to decimal fractions of an inch.

### Ernie Kopecky Trophy

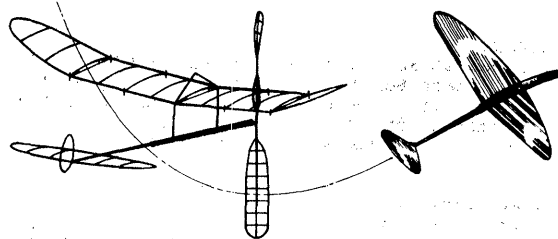
Anyone wishing to donate toward the Ernie Kopecky Trophy (to be awarded for high time single flight at '74 Indoor WCh) should send the donation to G. V. Russo, 143 Willow Way, Clark NJ 07066 or Pete Andrews, 100 River Rd. #A-11, Bogota NJ 07603.

### Feb. '74 INAV Damaged?

Several subscribers have written to note that their copy of the Feb. '74 issue was damaged, or mangled beyond use. If yours was damaged, drop a line and it will be replaced. This is a dual-purpose offer; you ought to be afforded a chance to have a readable issue, and the offer will enable me to determine the dimensions of the mail mangling problem afforded by (apparently) malfunctioning machinery.

### '74 Nats

The Feb. '74 INAV carried details about two complete indoor Nats sessions, with the proviso that arrangements had to be completed for use of the Goodyear hangar at Houston. Since that issue, word has been received that arrangements have been completed. Further, by advance contact with Mark Valerius, 2302 Pomeran Dr., Houston TX 77055, ph. 714-465-9818, it is likely that you can test-



fly any weekend you happen to be near enough; beginning in April.

Meanwhile, Mark reports that the hangar appears to be really air-tight with the doors closed, and that natural lighting is very good. The hangar is the usual quonset-hut shape, 160' wide and 260' long at the base, with 97' max internal. Construction is with curved, closed beams that should afford minimal hangup danger.

### FAI INDOOR REPORT

#### AEROLYMPICS Status Report

The whole Lakehurst bash (Indoor WCh, RC Pylon Meet and Indoor International Meet) has come to be called the Aerolympics. AMA's Feb. '74 Monthly Mailing (see your club secretary or other officers if you belong to an AMA Charter Club; or contact your District officers) has a complete report. So far, 14 countries have indicated intent to participate in the July 1-7 gala, but no figures showed the number of Indoor teams expected.

It is now confirmed that only entrants and a very few special helpers and officials will be able to obtain on-base housing, so make your own arrangements if you plan to attend in a non-official capacity. The status of entrants in the Indoor International Meet was not defined, and it is not known at this time if advance entry must be made for this event.

### Indoor Team to Practice?

The U. S. Indoor Team has officially requested they be allowed to practice at an early Lakehurst session as a team. If this is permitted, eastern indoor fliers have offered to make up several teams to give the session a competitive air. Not only is this worthwhile, it will be closely watched. Although special financial arrangements would be necessary for this to become a regular practice, it could well create the fine edge needed by all U.S. Teams regardless of model type flown.

### RECORDS? MAYBE!

INDOOR RECORD TRIALS, January, 1974, Cat. III AMA  
Santa Ana MCAF, California  
Junior HLG - 2:07.2, Steve Wittman

### CONTEST CALENDAR

#### CALIFORNIA - Santa Ana

Indoor Contest Mar. 24, 1974, 10 am to 4 pm, at Santa Ana MCAF. IHLG, Paper Stick, PennyPlane. Trophies to 3rd place. Test flying on Mar. 23, 1974. Bob Gibbs, 161 Larkwood Circle, San Ramon CA 94583.

#### CANADA - British Columbia

Indoor contests (FAI Cat. III) at the PNE Agrodome, Port Coquitlam, B.C., Scale, HLG, PennyPlane, FAI Stick, Mar. 10, May 5, June 9, 1974. Alan Riches, 1568 Celeste Crescent, Port Coquitlam, B.C., Canada V3C 1E2.

#### CONNECTICUT - Glastonbury

Indoor sessions Feb. 26, Mar. 12, Apr. 2, May 7 and June 4, 1974, 7 pm to 9:30 pm. Also on Sundays Feb. 17, Mar. 17, Apr. 21 and May 12, 1974, 8 am to noon. Sessions at Glastonbury High Gym. Contact George Armstead, 89 Harvest Lane, Glastonbury CT 06037

#### FLORIDA - Miami

Indoor contests at the Goodyear Blimp Base, Opa Locka Airport, 9 am to 5 pm, Feb. 17, Mar. 17, Apr. 21 and May 26, 1974. Indoor "Fly In" at JFK Gym, Miami Dade North, 9 am to 1 pm, Mar. 3, Apr. 7 and May 5, 1974. Contact Dr. John Martin, 3227 Darwin St., Miami FL 33133.

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

Indoor sessions at DuPont Gymnasium, Vassar St. and Mass. Ave., Cambridge, Mass. (use Vassar St. entrance). Mar. 9 and Apr. 6, 1974, 3 pm to 6 pm. Indoor contest on May 4, 1974; Indoor Stick, HLG, Indoor Scale, Peanut Scale, PennyPlane and Delta Dart. Contact Ray Harlan, 15 Happy Hollow Rd., Wayland MA 01778.

## ILLINOIS - Chicago

Indoor sessions at Forest View High School Girl's Gym, Arlington Hts. IL, each Sunday thru Apr. 28, 1974, except for Apr. 14 and Apr. 21, 9 am to 5 pm. Possible sessions at Madison St. Armory, 2653 Madison St., Chicago. Contact Pete Sotich, 3851 W. 62nd Place, Chicago IL 60629 for the dates.

## MISSOURI - Kansas City Area

Two contests are planned for the KC area this winter, with Indoor Scale and beginner events tentatively planned for February. Easy B and Indoor Stick will follow in March. Special awards for the best constructed scale model and the highest "no touch" Indoor Stick time. Contact Roger Schroeder, 4111 W. 98th St., Shawnee Mission KS 66207.

## NEW JERSEY - Lakehurst

Tentative dates at Lakehurst: Apr. 21, May 19 and June 16, 1974. Contest July 21, 1974, with Indoor Stick, Easy B, HLG, Peanut Scale and PennyPlane. Contact Sal Cannizzo, 20 Outerbridge Rd., Staten Island NY 10309.

## NEW JERSEY - Union

Indoor sessions sponsored by Union MAC; held at Livingston School on Midland Ave., Union NJ, 7 pm to 10 pm, Mar. 14, Apr. 4 and May 9, 1974. Contact Dan Domina, 47-01 Fox Run Dr., Plainsboro NJ 08536.

## NEW YORK - Long Island

Cat. I Record Trials at Boy's Gym of Friends Academy, Locust Valley, L. I., NY on Mar. 23, 1974, 11 am to 5 pm. Gym shoes required. Site is approx. 60' x 72', with shallow peaked roof, max height approx 33'. Contact J. G. Pallet, 30 Emerson Rd., Brookville, Glen Head NY 11545.

## STATE OF THE ART

Bucky Servaites won the '73 Nats with the glider shown on the plan page. He describes it thus:

The glider is a copy of Ron Wittman's SuperSweep 22 outlines with some modifications for low ceiling work. It was originally constructed for a Spring meet at the University of Cincinnati fieldhouse. The ceiling height there was 65 feet, so the ship was built to a weight of 14.8 grams. At the Nats I added ballast so the ship would roll out just above the lights. I've found that the less time spent flying through those lights, the better chance you have of making it down. On the 70 second flight, the rollout was about 10-15 feet above the lights for a total altitude of about 75 feet.

To obtain the 14.8 gram weight requires a choice of light wing stock. I used straight grained 4.6 lb. stock. I prefer straight grained wood for wings since it is more flexible and easier to bend for small trim adjustments. I've never folded a straight grained wing on launch, but have folded many wings of quarter grain wood. No warpage problems have been experienced with straight grain as long as dealer is limited. Quarter grain wood is necessary for tail surfaces since they are very thin.

An extremely handy gadget for selecting light wood is a small, cheap postal scale with a weaker spring substituted for the stock one, to give a maximum deflection of about three ounces. Glue on a piece of paper so it reads directly in lbs./cu. ft. for 1/4" x 3" x 36" balsa. The scale is compact enough to fit a coat pocket.

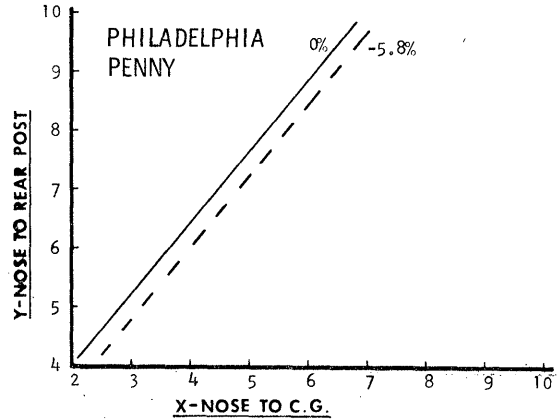
I have built subsequent models using heavier wood for the wings and the total weight really goes up. Using 5 lb. wood resulted in a model weighing about 19 grams. However these models climb much higher - perhaps approaching the optimum for a Cat. II site. The fuselage is a copy of one used by Richard Miller and fits my grip very well.

The Philadelphia Penny, by Dick Hardcastle, placed 2nd at the '73 Nats with 12:04. Dick claims his boy wasn't impressed, "Yes, Dad, but you were 2nd before. You didn't come up much!" About the model, Dick says, "My Philadelphia PennyPlane was conceived after viewing Kukon and McLean making flights over 12 minutes with tandems at a Philadelphia contest in 1971. My P.P.P. now has wings with chords of 5 1/2", 6", 7" and 8". I've also built tail wings/stabs with chords from 3" to 5 1/2". The model can fly with any combination of the above at pennyweight."

"I would like to say the combination flown at the Nats was chosen after exhaustive tests proved it best for the site. The truth is that a collision on the first test flight broke the 4 1/2" stab. While the repairs were drying, I sent up a test flight with a 6 1/2" wing and 3" tail. The first flight did 10:45, so I didn't change. Official flights followed: 11:14, 11:17, 11:36 and 12:04.8. I did not change wings, stabs, CG or rubber all of which were available. After the 12 minute flight a test flight of 12:27 was made on different rubber. The last official was "all out" and hung at 2:35."

"The Philadelphia Penny is truly a flying lab. With additional paper sockets along the stick and boom, wings and stabs can be changed to fly the model from tandem to conventional. Incidence can be changed on front and rear wings, and the rudder can be turned. A sliding ballast can be moved to adjust CG. Unfortunately, the only time I fly the model is at the Nats when time is short."

According to the NIMAS aero engineer (Hal Crane), the tandem type layout may not fit the normal balance schemes properly. However, the CMOS and INP calculations will allow duplication of Dick's general trim. Since the CMOS calculated to -5.6% (normally too "critical" for low aspect ratio PennyPlane) and the INP came to -2%, it may be that the low tail position places it out of downwash so it is more effective. Anyway, balance it certainly no more critical than -5% CMOS, and preferably 0% or more forward.



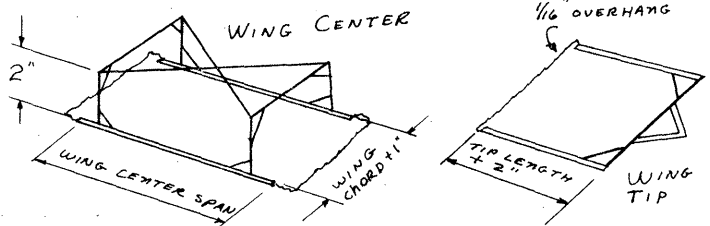
## PENNYPLANE HINTS

### PennyPlane Covering

by Dennis Jaacks

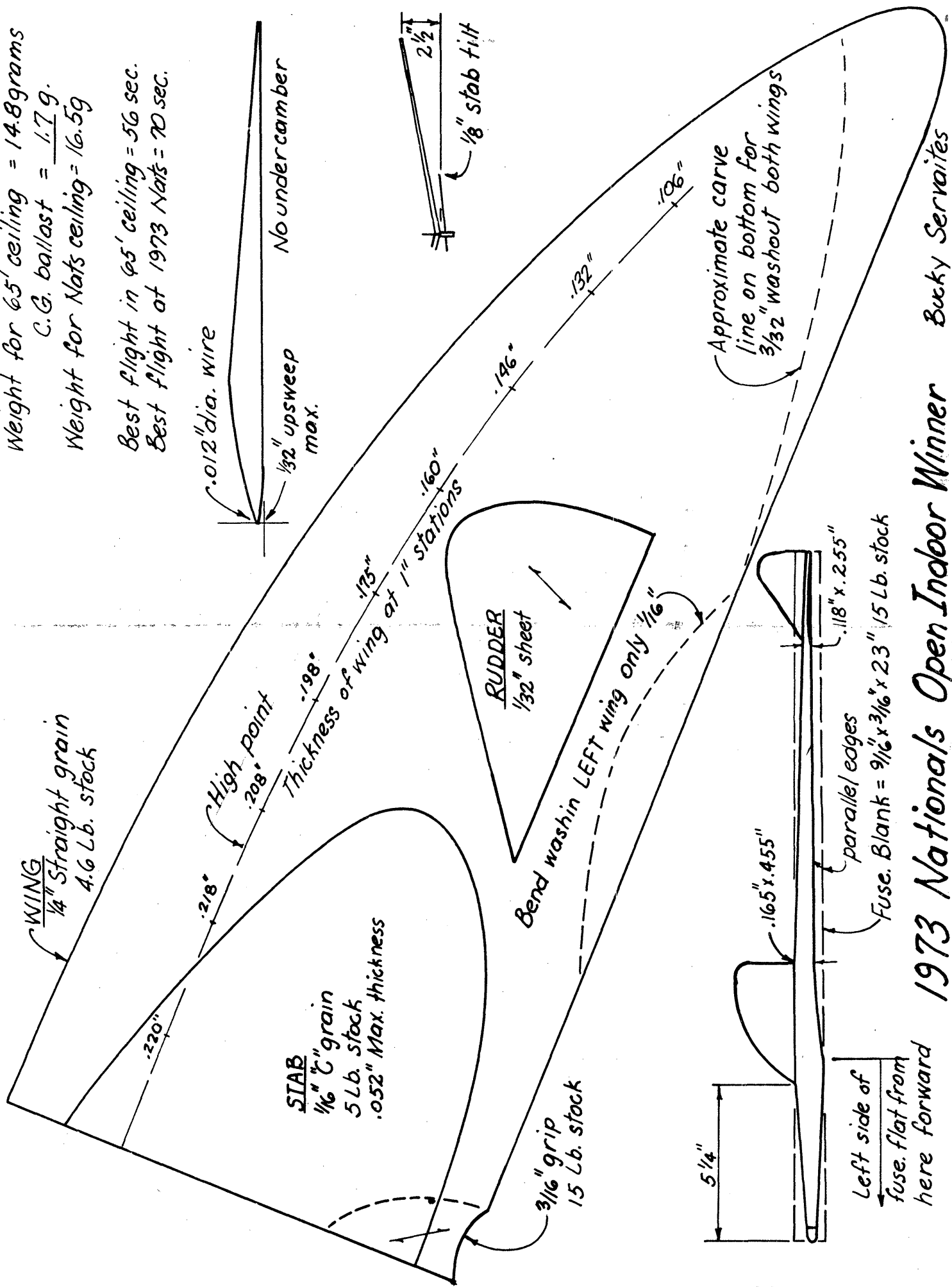
1. Handling of microlite\* can be made easier by placing it between two sheets of paper, such as newspaper or heavy tracing paper. It can then be cut to size and shape with scissors.
2. Covering frames are worth the time and trouble needed to build them, since they speed up and improve the covering job. See sketches below for construction ideas, and it is recommended that 1/16" x 3/16" wood be used.
3. Used thinned rubber cement to attach either microlite or condenser paper. Thin the cement to about the consistency of water. Use naphtha based rubber cement, since this solvent does not affect microlite. Pipe cleaners make excellent disposable brushes to apply the cement.
4. Trim microlite with methylene chloride applied with a #000 size brush. This solvent can be slowed down by adding ethylene dichloride. **Safety Note:** both these solvents are hazardous to breathe, and should be used only under conditions of excellent ventilation. **Bear in mind** that this same comment applies to acetone, methyl ethyl ketone, butyl acetate and almost all other solvents used in microfilm solutions.
5. Coat wing and stab outlines (where covering touches) with thinned dope or microfilm solution to seal the wood. This prevents the thinned rubber cement from soaking in, so that only one coat is needed to attach the covering.

\*Microlite is polycarbonate-type plastic film which weighs approximately half as much as the lightest condenser paper and perhaps five times as much as microfilm. It is dimensionally stable (won't shrink, except slightly with heat), and is quite strong. It is available from Micro-X, P O Box 1063, Lorain OH 44055. By using microlite to cover PennyPlane, it is possible to save perhaps 7% of the total weight. The advantage is to concentrate the required excess weight near the CG to reduce the moment of inertia of the model, which improves dynamic stability.



Weight for 65' ceiling = 14.8 grams  
 C.G. ballast = 1.7 g.  
 Weight for Nats ceiling = 16.5 g

Best flight in 65' ceiling = 56 sec.  
 Best flight at 1973 Nats = 70 sec.



1973 Nationals Open Indoor Winner Bucky Servaites

PHILADELPHIA PENNY

1/4

12:04 20 '73 NATS 3/4

WING 750 mg  
STICK 750  
STAB 280  
PROP 800  
BALLAST 520

POWER:  
.098 X .042 X 18 1/4  
PIRELLI

MICROLITE  
COVER

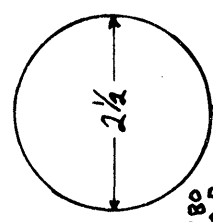
RIBS .045 X .065  
SPARS .057 X .095 > .045

9 3/4

8 3/4

6 1/2

5/8



2 1/2

.023  
O.D.

.013" C.G. RAIN

O.D. .330  
.025 C.G. RAIN

69%

2 3/8

2 5/8

PAPER SOCKETS

.180  
O.D.

.016 WIRE

7 1/4

10

16

SPARS .045 X .060 > .040  
RIBS .032 X .050

3

DOWN & LEFT  
THRUST

FRONT VIEW

1/4  
WASHIN

2 3/8

17 1/4 D X 28 P

.028 C.G. RAIN

1/2 TILT

L.E.

STAB

Dick Hardcastle

WING

.015

# INDOOR

## NEWS and VIEWS

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

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

New Members!

DAVID ELLIS, 8301 W. 92 St., Overland Park KS 66212  
 JOEL FONER, 31 Payson Terrace, Belmont MA 02178  
 STEPHEN A. VOSA, 53 Ethel Dr., Portsmouth RI 02871

Honorary Members

MICHAEL SHERMAN, 22 Rosebank Rd., Papatoo, Auckland,  
 New Zealand

NIMAS Postal Meet

By the time you receive this issue, your entry in the 9th Annual NIMAS Postal Meet should be in the mail. Good luck, and good flying!

Renewal Reminder

Check the mailing label on this issue now! If it has "04" in the corner, your subscription expires with this issue. Those with "05" and "06" expire in May and June respectively. If you send payment in advance, it saves time around here; thanks are due to the many who have made early renewal in recent months. Membership costs \$3.25, subscription only costs \$2.25.

Junior ACE

Ten year old Steve Wittman has amply qualified as a Junior NIMAS Ace in Cat. III HLG. Normally, an Ace candidate "works up" to Ace, by qualifying for Silver, Gold and Diamond awards. However, the respective times for Junior Cat. III HLG are 0:41, 0:49 and 0:56. Steve hasn't had times lower than 59 or 60 seconds for months, and his recent record application times are over 63 seconds - almost equal to Open Cat. III Gold times.

NIMAS Awards

There has been very little activity in the NIMAS Award program in recent years; perhaps because details haven't been published recently.

Basically, NIMAS Awards are made for flights meeting the time standards detailed below, when made under circumstances generally conforming to AMA contest conditions. Application blanks containing full details are available upon request.

Junior Awards

Indoor Stick (Any class model, single flight)

AWARD	Cat. I	Cat. II	Cat. III
Silver	7:30	15:00	21:00
Gold	9:30	18:45	26:30
Diamond	11:15	22:30	31:30

Indoor HLG (Best single flight of nine)

AWARD	Cat. I	Cat. II	Cat. III
Silver	0:18	0:34	0:41
Gold	0:22.5	0:41	0:49
Diamond	0:27	0:49	0:56

Open Awards

Indoor Stick (Any class model, single flight)

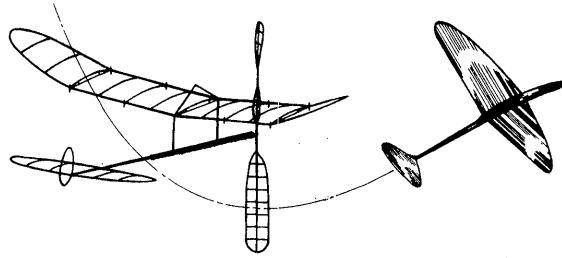
AWARD	Cat. I	Cat. II	Cat. III
Silver	10:00	20:00	30:00
Gold	12:30	25:00	35:00
Diamond	15:00	30:00	42:00

Indoor HLG (Best single flight of nine)

AWARD	Cat. I	Cat. II	Cat. III
Silver	0:24	0:45	0:55
Gold	0:30	0:55	1:05
Diamond	0:36	1:05	1:15

'74 Nats

The '74 Indoor Nats schedule by site is shown below. The following matters have not been officially cleared up,



as of this time; PennyPlane is rumored to be held only at Houston, presumably on Aug. 4. Peanut Scale is to be held at least once, maybe twice; no official word has been put out yet. An editorial speculation in the Feb. '74 INAV indicated that Championship points declaration would only involve a maximum of 3 out of 6 events; a conversation with Carl Wheeley (editor, Competition News) indicated that some other arrangement was perhaps being considered.

High Cat. II Indoor - Goodyear Blimp Hangar, Houston TX.  
 Aug. 4, 1974 - Indoor HLG  
 Aug. 5, 1974 - Indoor Stick, Paper Stick, Cabin, FAI  
 Med. Cat. II - Civic Center, Lake Charles LA.  
 Aug. 6, 1974 - Indoor Stick, Paper Stick, Cabin,  
 FAI Stick, Easy B (Easy B not for Champs points)  
 Aug. 7, 1974 - Indoor HLG, Indoor Scale

As noted above, Easy B will be a competition event at the Lake Charles site, but not eligible for Champs points. The rules to be used were defined by Event Director John Thornhill and shown here:

1. Solid motor stick and tail boom required.
2. Paper covering only.
3. No bracing permitted.
4. All other rules shall be as outlined on p. 14 of the 1974-75 AMA Rule Book.

The Modeler's Press

The Modeler's Companion is a handy appointment/calendar/reference pocket book with conversion factors and other handy info listed. If you need a pocket notebook to keep track of appointments, list contests and meetings, and need to look up metric conversions and mathematical formulas, the Companion is for you. It is available for 50¢ + 25¢ postage and handling, from The Modeler's Press, P O Box 170, Kensington MD 20795.

FAI INDOOR REPORT

AerOlympics

AMA's Monthly Mailing indicates that about 200 people have indicated intent to attend, or made deposits on the special charter flight from Europe. In addition, many from Canada and Mexico are coming. From Eastern Europe, at least Poland, Czechoslovakia and Hungary have indicated intent to send teams.

Part of the Aerolympics financial support will come from booster packets - available to all who donate \$10 or more to the AMA 1974 AerOlympics fund. The packets contain identification allowing special parking privileges, an official cloth patch emblem, parking bumper stickers, souvenir emblems and official program booklet.

Team Manager Chosen

When word came that Bob Champine, who ordinarily would have been the U.S. Team Manager, is to be the Indoor WCh director, the question arose, "Who is Team Manager?" Word has arrived noting that Dick Kowalski has been appointed, following the previous precedent of taking the 4th place flier from the Team Finals. Dick is experienced as manager, having served in 1961 and was appointed to serve in 1964 ('64 WCh was cancelled due to lack of entry). Our Team is in good hands!

Indoor Team To Practice

Official approval has been granted for the Indoor Team to practice as a Team at Lakehurst, with travel expenses paid. This was granted in view of the fact that no expenses for overseas travel would be needed for this Team. It is expected that the practice session will be May 18-19, 1974, and that several local teams will compete against the official Team. The practice date is late enough for good conditions, and early enough to mend any deficiencies the Team may find in equipment and models.

World Champion To Compete

Two or three years ago, the CIAM decided that the reigning World Champion could compete in the next WCh, even if he was not on the team. Accordingly, Pete Andrews will compete in the '74 Indoor WCh, defending his title on his home territory. This will add another interesting dimension to the competition!

### New FAI Committees

The AMA Executive Council, at the Mar. 9, 1974 meeting at Lake Charles, La., recognized the NFFS in a special way. The NFFS has been given the responsibility of administering most aspects of the FAI Indoor and FF programs, following the guidelines presented by Hardy Brodersen, (Assoc. VP, Dist. VII) and approved by the Council.

All participants in the past three Programs (both Indoor and FF) have received a memo from Hardy (via AMA HQ), explaining the new program setup and asking for a vote on members for the two Committees.

Briefly, each Committee is intended to be made up of one member from each AMA District, appointed by NFFS subject to the approval of the VP of that District. The Committees are charged with the responsibility of designing Team Selection Programs acceptable to the AMA President and approved by vote of 2/3 of the participants of the previous Program. It is intended that Program participants help guide the program by voting on committee members, suggesting program formats, returning questionnaires which pose questions about program details, and voting on the final program makeup.

If you were somehow missed on the memo mailing, or haven't participated in a program but plan to enter some future program, contact AMA HQ for a copy of the memo.

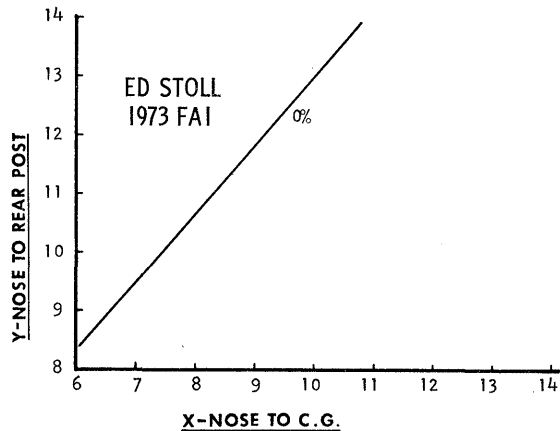
### RECORDS? MAYBE!

**THERMAL THUMBER'S INDOOR MEET, Mar. 24, 1974, Cat. III**  
Santa Ana MCAF, Los Angeles, Cal.  
Junior Autogyro - 0:50.0, Jeanine Andrews  
Senior Paper Stick - 16:37, Kim Mather  
Junior HLG - 2:06.6, Steve Wittman

### STATE OF THE ART

Ed Stoll's 1973 FAI was outstanding in one respect in that cruise/letdown RPM often was in the low 30's - a number seldom realized by models smaller than 90 cm FAI's. In other respects, the model looks conventional until the fine details show up. Many ideas on the model are credited to Dick Kowalski - wing airfoil, prop outline, etc; but Ed also learned from weaknesses demonstrated by Dick's models. The 6% airfoil was one such compromise. On airfoil thickness, Ed says: "It is our opinion that you actually consume less power throughout the flight by using the thicker airfoil. I plan to stick to my 6% wing, which is a little less than Dick's. There is probably less drag at low Reynolds Numbers for the lift produced in the thicker section than in the thinner airfoils. Like in so many things, there are exceptions. If we come up with a bad day the climb must take precedent over everything else, so I plan to build a couple of wings of 4 to 4½% thickness."

Ed's trim checked out at -1.4% margin (CMOS) and at 16% margin by INP. These figures are right down the line at theoretical optimum - the low cruise RPM with nose-high approach confirms both trim setup and optimum power selection (loop length and cross section).



### CONTEST CALENDAR

**CALIFORNIA - Santa Ana**  
Indoor Scale at Santa Ana, Apr. 28, 1974; contact Ferdinand Ramos (address not furnished, 1970 address was 19361 S. Mesa Dr., Villa Park CA 92667). Indoor Record Trials May 25-26 and June 22-23, 1974. Contact Bob Randolph, 25145 Lawton Ave., Loma Linda CA 92354.

**CALIFORNIA - Taft**  
Indoor (PennyPlane, Peanut Scale and HLG) has been

added to the U. S. Free Flight Championships held at Taft, Calif. The events will be flown in a gym in Taft; the site has a 40' ceiling and 80' x 100' floor; date - May 25, 1974. Jim Scarborough, Box 393, Lawndale CA 90260.

### CANADA - British Columbia

Indoor contests (FAI Cat. III) at the PNE Agrodome, Port Coquitlam, B. C.; Scale, HLG, PennyPlane, FAI Stick, May 5, June 9, 1974. Alan Riches, 1568 Celeste Crescent, Port Coquitlam, B. C., Canada V3C 1E2.

### CONNECTICUT - Glastonbury

Indoor sessions May 7 and June 4, 1974, 7 pm to 9:30 pm. Also on Sunday, May 12, 1974, 8 am to noon. Sessions at Glastonbury High Gym. Contest Apr. 28, 1974, 8 am to 5 pm, HLG, Old Time HLG, Peanut, Old Time Peanut, Old Time Scale, PennyPlane, Indoor Stick, Cabin, Old Time Stick, Old Time Cabin, WWI Peanut Combat. Contact George Armstead, 89 Harvest Lane, Glastonbury CT 06037.

### FLORIDA - Miami

Indoor contest at the Goodyear Blimp Base, Opa Locka Airport, 9 am to 5 pm, May 26, 1974. Indoor "Fly In" at JFK Gym, Miami Dade North, 9 am to 1 pm, May 5, 1974. Contact Dr. John Martin, 3227 Darwin St., Miami FL 33133.

### MASSACHUSETTS - M.I.T.

Indoor contest at DuPont Gymnasium, Vassar St. and Mass. Ave., Cambridge, Mass. (use Vassar St. entrance), May 4, 1974. Indoor Stick, HLG, Indoor Scale, Peanut Scale, PennyPlane and Delta Dart. Contact Ray Harlan, 15 Happy Hollow Rd., Wayland MA 01778.

### NEW JERSEY - Lakehurst

Flying sessions at Lakehurst: May 19 and June 16, 1974 with contest on July 21, 1974; Indoor Stick, Easy B, HLG, Peanut Scale and PennyPlane. Contact Sal Cannizzo, 20 Outerbridge Rd., Staten Is. NY 10309.

### NEW JERSEY - Union

Indoor session sponsored by Union MAC at Livingston School on Midland Ave., Union, NJ, 7 pm to 10 pm, May 9, 1974. Dan Domina, 47-01 Fox Run Dr., Plainsboro NJ 08536.

### NEW YORK - Long Island

Cat. II Indoor Contest at Cantiague Park, Hicksville, L.I. NY, Apr. 28, 1974, 8 am to 5 pm. HLG, Easy B, Peanut Scale, Indoor Scale and Indoor Stick. CD J. G. Paillet, 30 Emerson Rd., Brookville NY 11545.

### OHIO - Euclid

Cat. I Indoor Contest, May 12, 1974, at the Euclid Arena, 10 am to 6 pm. Easy B, Paper Stick, Indoor Stick, Peanut Scale, Jetco ROG, Sleek Streak. CD Dr. Vern Hacker, 25599 Breckenridge, Euclid OH 44117.

### WHAT HAVE WE DONE TO PENNYPLANE?

by Bob Clemens

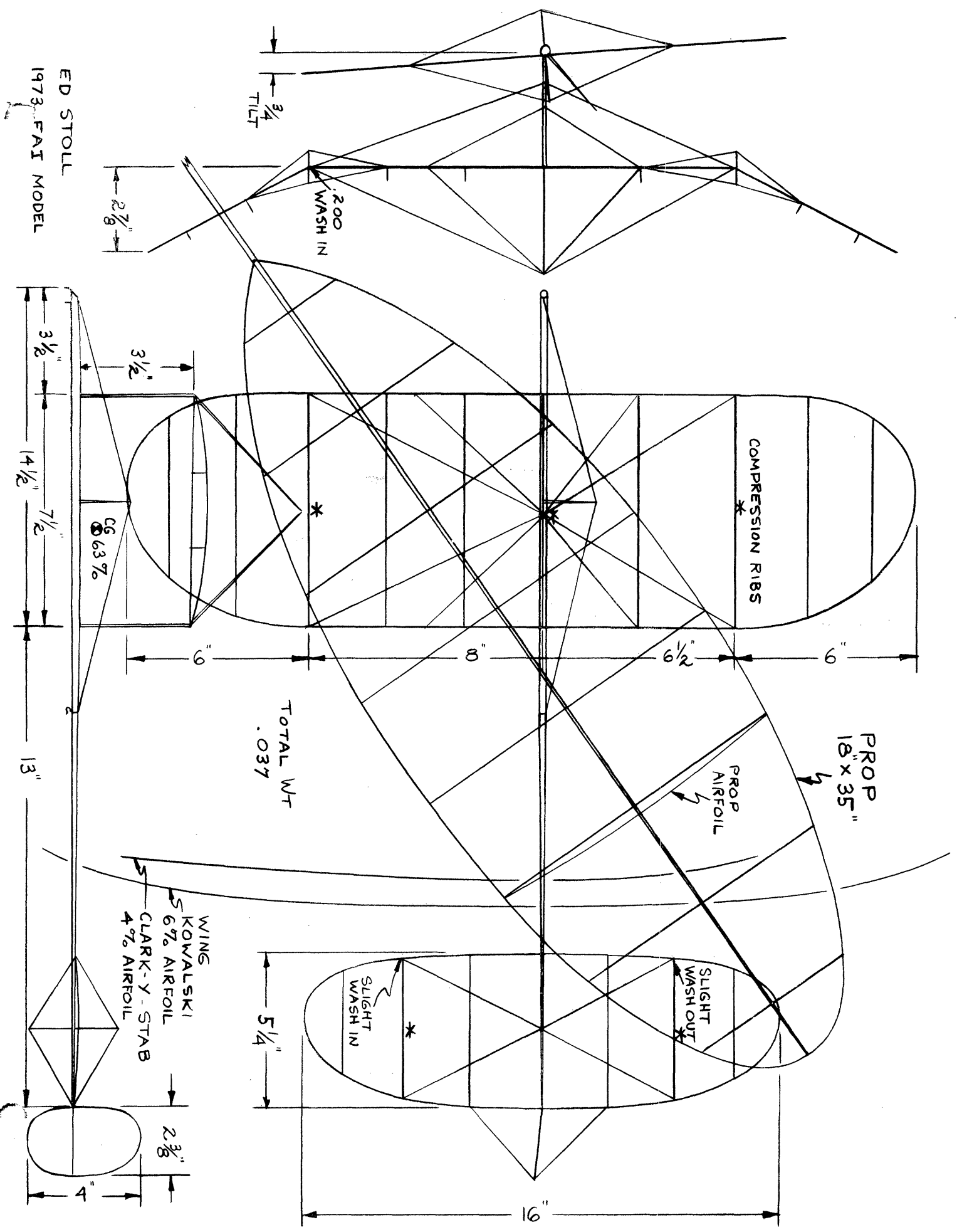
I have very fond memories of flying PennyPlane at the Nationals in 1970. This was the first year for this then-new event, but it still managed to attract a total of 28 entries: 19 open and 9 juniors. Tim Noonan won Junior with 6:32.2, while Clarence Mather took first in Open with 8:28. Close on his heels was event director Ery Rodemsky with 8:16. My 6:48 gave me third, just ahead of Al Rohrbach with 6:24.

The thing I really remember about that afternoon was the sheer fun of flying our simple, stick-and-tissue ships, most of which looked like nothing more than slightly overweight Easy B's. No one really knew just how well- or how poorly- these new creations might perform as the contest got under way; by its end we were all pretty surprised at the duration we could get. Equally important, we all had a lot of fun competing.

In the three years that have passed since that first meet, what have we done to PennyPlane? Gone are the simple, easy-to-build-and-trim ships of 1970. In their place float the ultra-light, ballasted to weight creations of the indoor endurance experts, their stubby wings shimmering with Micro Lite film. These models, the end products of highly sophisticated building and trimming techniques, are capable of flight durations in excess of 12 minutes, fully 50% ahead of the best of 1970's PennyPlanes. Real progress, right?

Wrong! Who needs another super-sophisticated indoor duration event that only our top technicians and experts can handle properly? The existing paper stick, AMA Stick, and FAI Stick events certainly provide enough outlets and challenges for these people. PennyPlane, as originally flown, was a fun event in which contestants of somewhat widely varying degrees of skill and talent could all compete on a fairly equitable basis, and have a great time doing it. This was a real change-of-pace!

ED STOLL  
1973 FAI MODEL



In the spirit of the early days of PennyPlanes, I would like to propose these changes in the PennyPlane rules:

1. Maximum wing chord - 4".
2. Only covering material permitted - Japanese tissue.
3. Only solid wood motor sticks permitted.

All other PennyPlane rules would stay as they are. If the experts find this version too dull, fine. Let them stick with paper stick and microfilm. Let's put PennyPlane back at the simple, fun level where it belongs.

PENNYPLANE IS TOO FUN!

by Bud Tenny

I guess Bob Clemens and I see it differently! The avid scale modeler finds a challenge in creating a scale model airplane in a form which balances scale points, construction skill and aerodynamic factors to create successful hands-off flight. My challenge in P/P is to accept size and weight limitations specified in the rules, then to balance many aerodynamic factors in an attempt to outdo other fliers. It was fun to compete against the best at the Nats! From that vantage point, I oppose Bob's suggested limitations for the following reasons:

1. Limit wing chord to 4": First, to specify chord makes just one more thing for the CD to check. Second, part of the event's challenge is to find optimum design parameters, one of which is aspect ratio. Finally, if limited chord can be shown to improve the event, the wing loading resulting from a 4" max chord is as extreme, in my opinion, as Dennis Jaeck's 8" chord. From past experience, I feel that a high wing loading model is as difficult for all but the expert to trim as is the very wide chord. Maybe this would be offset by the greater ease of construction and handling inherent in the narrow chord, and maybe not.
2. Jap tissue covering: I feel this is also an extreme. Jap tissue reacts to moisture just as condenser paper does. On the relatively fragile P/P surfaces, it would be no easier to work with than condenser paper. Worse, jap tissue is porous and should be doped to be airtight. This is an impossibility for any but an expert. Granted, microlite is also difficult to handle. However, one of the most frequent questions asked is how to prevent condenser paper from warping models. That is one problem that doesn't arise with microlite!
3. Solid motor stick: One of the most difficult skills to learn in Indoor is how to select good wood for solid motor sticks and booms. For a high power model such as P/P, the problem is aggravated. True enough, one can use a "log" with no problem except weight. However, my experience in working with beginners leads me to believe that a rolled stick is far easier to build than an equivalent solid stick. Only when ultra-long, lightweight sticks are needed does the skill needed approach that needed for a good solid stick.

The above reasons are all technical and philosophical. From a purely personal reaction, I find it immensely satisfying to have an indoor model that I don't have to buy special wood for, or agonize over which piece of special wood to use. Even though it is finicky to use, microlite is stable and long-lasting. In contrast, condenser paper is a nightmare to use and tissue isn't much better, without considering its need for dope. Finally, P/P is a class that is not delicate to handle, except when fully wound. It is possible to allow spectators to handle the model - thus showing them it isn't as hard to do as other indoor models. Finally, and most important to me, is the fact that site conditions here often have been poor (hangar door open slightly, for example) that microfilm models couldn't be flown. PennyPlane will fly pretty well under circumstances when even Easy B's wouldn't. And, if Bob is classifying me as one of the "experts" - let's remember that 6th place in Paper Stick, 5th in Stick and 8th in PennyPlane is my track record!

Anyone Else?

If the above comments on PennyPlane happen to strike a responsive chord, please share your thoughts and ideas!

CONTEST RESULTS

Fall Ceiling Banger contest, Nov. 17, 1973, Glastonbury Modelers. Glastonbury Gym, Glastonbury CT.

Junior HLG		Sr.-Op HLG	
E. Boldthwait	57.9	G. Armstead	70.7
J. Schaulbe, Jr.	46.2	R. Nichols	64.8
D. Armstead	34.0	A. Vollmer	62.2

Old Time Stick ('40 rules)		Old Time Fuselage	
Ray Harlan	10:20.0	Ray Harlan	114.0
Hank Struck	6:55.4	E. Novak	107.0
G. Donahue	4:23.9	D. Stott	103.5
Old Time Peanut		Old Time Scale	
C. Bukowski	43.3	D. Stott	70.9
M. Nallen	41.0	E. Novak	47.5
D. Stott	39.1	J. Hodgkin	29.1
Old Time HLG		Junior Peanut Scale	
R. Nichols	30.4	T. Nallen	146.3
E. Franklin	28.0	M. Nallen	115.4
G. Donahue	27.6	J. Foner	93.5

Sr.-Op Peanut Scale	
D. Stott	211.4
F. Hall, Jr.	197.5
C. Learoyd	186.0

Chicago Aeronauts Indoor Contest, Jan. 26, 1974 Cat. II  
Madison St. Armory, Chicago

Jr.-Sr. Paper Stick		Open Paper Stick	
Scott Wisniewski	9:25.6	Chuck Markos	14:50.3
Keith Gordey	8:27.2	Howard Haupt	12:59.3
Eric Miller	7:57.6	Dennis Jaecks	12:36.5
Carl Linstrum	0:36.7	Bob DeBatty	11:07.6
		Steve Brown	10:05.0
Jr.-Sr. Indoor Stick		Charlie Sotich	10:01.7
Keith Gordey	12:58.0	George Bucic	7:44.4
Scott Wisniewski	5:40.4	Ken Kraemer	7:04.3

Open Indoor Stick	
Bob DeBatty	16:16.6
Dennis Jaecks	14:37.6
Howard Haupt	13:10.6
Steve Brown	12:57.0
Charlie Sotich	12:36.0

INDOOR ELSEWHERE

ITALY - Rimini  
On Nov. 3-4, 1974, an indoor contest was held in the arrivals room of the Miramare/Rimini Airport, with less than good conditions. Ceiling height was 8 meters.

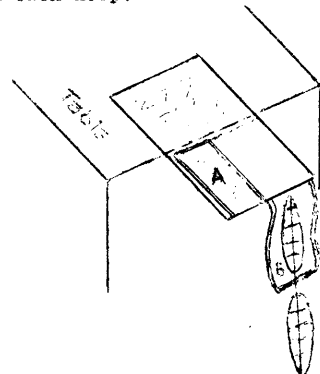
<u>FAI Stick</u>				
1. Carlo Cotugno	Roma	10:45	9:26	20:11
2. Adalberto Frioli	Rimini	10:22	8:50	19:12
3. Ferdinando Migani	Rimini	10:04	8:53	18:57
4. Germano Masciullo	Roma	8:31	7:52	16:23
5. Pierluigi Migani	Rimini	6:30	6:21	12:51

<u>PennyPlane (3.2 g weight)</u>	
1. Nello Sighelle	Bologna 4:50
2. Leonardo Militi	Rimini 4:22
3. Bruno Militi	Rimini 4:08
4. Pierluigi Migani	Rimini 3:30
5. Paolo Seghettini	Rimini 3:12
6. Armando Seghettini	Rimini 2:59
7. Quarto Cecchetti	Rimini 1:45

HINTS AND KINKS

Prop Covering

Larry Cailliau developed this method of prop covering and finds it quick and easy. As shown in the sketch, a mike hoop is extended over the edge of the workbench some distance in excess of the length of a prop blade. Then, lay 1/2" wide moist strips of newspaper on the film, with at least 1/2" clearance around prop outline. Allow paper to dry, then cut loose three sides of the paper outline and allow it to hang. Moisten the prop outline and lay the prop against the film. Allow outline to dry and trim it loose. With proper planning, more than one prop can be covered from each hoop.





# INDOOR

## NEWS and VIEWS

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

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

### New Members!

BILL SCHUH, 267 E. County Line Rd., Barrington IL 60010

### Newsletter Award

Some members of the Executive Council, following the lead of Dist. V VP Jim McNeill, are awarding special certificates to newsletter editors. One arrived here last month inscribed "The Academy of Model Aeronautics has conferred upon Bud Tenny membership in the Aero Honor Society for Newsletter Editors".

It was an honor to receive this, yet it is humbling to realize how much INAV's success depends upon active and faithful support by its readers. Only a small part of each issue cannot be characterized as having been furnished, inspired or reported by one or more of over 300 readers in over 20 countries. Quite simply, INAV is only the funnel thru which a great variety of news and information pours; the award belongs as much to INAV's readers as to the editor!

### Spread The Word!

TV viewers in the Boston, Mass. area should watch TV station ZOOM sometime in June. New NIMAS member Joel Foner will appear in a sequence where he builds and flies a model helicopter. Although this program is aimed at Junior-aged kids, it should be interesting to all.

### '74 Nats

It appears that the schedule for all the indoor events has stabilized as shown below:

Houston (97' ceiling) <u>Aug. 4, 1974</u> HLG - 9 am-5 pm PennyPlane - 5 pm-9 pm <u>Aug. 5, 1974</u> Indoor Stick Paper Stick All 9 am-9 pm Indoor Cabin FAI Stick	Lake Charles (55' ceiling) <u>Aug. 6, 1974</u> Indoor Stick Paper Stick Indoor Cabin All 9 am-9 pm FAI Stick Easy B <u>Aug. 7, 1974</u> HLG - 9 am-3 pm Indoor Scale, Peanut Scale Navy Scale - 3 pm-9 pm
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### Nats Indoor Championship Points

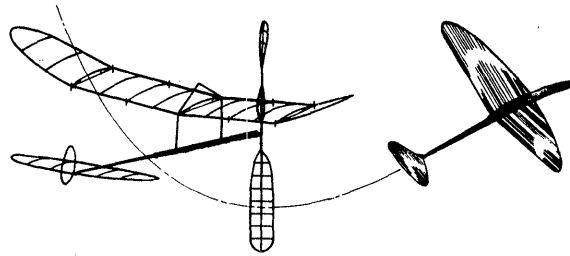
Editorial speculation (Feb. '74 INAV) raised the question of the number of events which could be declared by potential Indoor Category Champs. The Nats entry blank answered the question by setting the limit at 6 events. Therefore, any combination of the eleven events (5 at Houston and 6 at Lake Charles; PennyPlane, Easy B, Peanut Scale and Navy Scale are not eligible) can count. This new lineup may cause some interesting strategy planning by the Champs entrants!

### New Winder Ready

Many fliers were interested in the Bob Wilder prototype winder which I had at the Nats and the Finals. At that time, Bob was sure that that particular design was difficult to manufacture and used too many scarce and expensive parts. However, he has now completed a new design which works beautifully and sells for \$24.50, plus \$1 for postage and handling. Bob tested the winder to 3 inch-oz. torque, so it is plenty rugged. Even so, it has the same smooth feel of the prototype and the same 20:1 ratio. The case size is the same - 3" dia. - with an overall length about 3 3/4". The turns counter resembles a lathe dial indicator, except that the 3" diameter allows 5 turn graduations and it can be interpolated to one turn. Counter capacity is 500 turns/revolution, with friction-type resetting action. Two standard hooks are available - 1/8" wire and .045" wire. Finally - no squabbles over whose winder it is - Bob personalizes each winder by putting a plate with your name on it. Order your winder from Bob Wilder, 2010 Boston, Irving TX 75060.

### Info Wanted!

Several readers have requested that future three-views



show wood sizes of the various parts of the model. In the past, this information has always been made available when it was given, so it is up to those of you who send these three-views. If possible, let us have wood sizes!

Jim Pulley has noted that INAV has presented all sorts of detailed information, but never a formula for a glue that won't shrink. My personal favorite glue, which seems to shrink very little, is Duco Household Cement which has been thinned to suit with acetone and amyl acetate. Does anyone have other low-shrink or no-shrink glues?

### FAI INDOOR REPORT

#### Charter Flight Cancelled

Until just a few weeks ago, it was expected that many European fliers and supporters would come to the Aerolympics via a special charter flight. Then, at the selected go-no-go point, not enough reservations had been made and the flight had to be cancelled.

The chief concern raised by the cancellation was the number of entries in the two WCh events - Indoor and Scale. At the latest word, the Indoor WCh entry was over the minimum of five teams entered, and there would be no cause for cancellation. At last count, the following team entries were in or promised: Japan, U. S., Canada, Finland, Poland and England.

#### Free Flight FAI Committee

As announced in the Apr. '74 INAV, the National Free Flight Society has been given the responsibility of naming FF and Indoor committees which are charged with recommending team selection program details. Participants in the past three team selection programs nominated the following members to the Indoor Committee:

Dist. I Ray Harlan	Dist. VII Dick Kowalski
Dist. II C. V. Russo	Dist. VIII Bud Tenny
Dist. III Bucky Servaites	Dist. IX Ted Gonzoph
Dist. IV Hal Crane	Dist. X Erv Rodemsky
Dist. V Dave Linstrum	Dist. XI Gaiser, Walters, Schultz
Dist. VI Al Rohrbaugh	

Each of the above nominees must be confirmed by the Dist. VP, or in the case of Dist. XI, one of the three will be confirmed by the VP. In similar fashion, Erv Rodemsky was named Chairman, subject to approval by AMA President John Clemens.

### RECORDS? MAYBE!

Junior Cat. I Helicopter - 5:22.5, Joel Foner  
Junior Cat. II Helicopter - 6:20.9, Joel Foner

### 1974 NIMAS POSTAL RESULTS

Name	Time(sec.)	Ceiling	Fudge	Score
<u>Jr. Class I HLG</u>				
Mark Grayson	39.0	20.2'	1.238	48.3
<u>Open HLG</u>				
Bob Lelshman	38.7	18'	1.39	53.8
Philip Walden	40.0	20.2'	1.238	49.5
Charlie Learoyd	45.0	25'	1.0	45.0
<u>Jr. PennyPlane</u>				
Jason Katsanis	159.0	20'	1.323	196.8
<u>Open PennyPlane</u>				
Clarence Mather	429.0	22.3'	1.253	530.9
Alan Riches	386.2	20.2'	1.316	477.9
Charlie Learoyd	370.0	25'	1.183	437.7
Ted Katsanis	233.0	20'	1.323	308.3
<u>Jr. Easy B</u>				
Phil Futo	188.0	20'	1.323	232.7
Jason Katsanis	51.0	20'	1.323	63.1

### Sr. Easy B

Joe Skraba	65.0	20'	1.323	80.4
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### Open Easy B

Hal Crane	593.0	20.2'	1.318	733.9
Bob Platt	583.0	20.2'	1.318	721.5
Fudo Takagi	471.5	22.3'	1.253	583.5
Mike Thompson	349.0	20'	1.323	431.9
Bob Leishman	288.0	18'	1.394	401.5
Ted Katsanis	215.0	20'	1.323	266.1

### CONTEST CALENDAR

#### CALIFORNIA - Santa Ana

Indoor Record Trials May 25-26 and June 22-23, 1974 at Santa Ana MCAF. Contact Bob Randolph, 25145 Lawton Ave., Loma Linda CA 92354.

#### CALIFORNIA - Taft

Indoor (PennyPlane, Peanut Scale and HLG) has been added to the U. S. Free Flight Championships held at Taft, Calif. The events will be flown in a gym in Taft; the site has a 40' ceiling and 80' x 100' floor, and the date is May 25, 1974. Contact Jim Scarborough, Box 393, Lawndale CA 90260.

#### CANADA - British Columbia

Indoor contest June 9, 1974 at the PNE Agrodome, Port Coquitlam, B. C.; site is FAI Cat. III and events are Scale, HLG PennyPlane and FAI Stick. Contact Alan Riches, 1568 Celeste Crescent, Port Coquitlam, B. C. Canada.

#### FLORIDA -Miami

Indoor contest at the Goodyear Blimp Base, Opa Locka Airport, 9 am to 5 pm, May 26, 1974. Contact Dr. John Martin, 3227 Darwin St., Miami FL 33133.

#### ILLINOIS - Chicago

Midwestern States Indoor Championships, May 25-26, 1974, 9 am to 6 pm, at the Brig. Gen. R. L. Jones Armory, 5200 S. Cottage Grove Ave., Chicago. Paper Stick, Indoor Stick, FAI Stick, Indoor Cabin, HLG, PennyPlane and Indoor Scale. Pete Sotich, 3851 West 62nd Pl., Chicago IL 60629.

#### NEW JERSEY - Lakehurst

Flying session at Lakehurst on June 16, 1974 and contest on July 21, 1974. Contest events Indoor Stick, Easy B, HLG, Peanut Scale and PennyPlane. Contact Sal Cannizzo 20 Outerbridge Rd., Staten Is. NY 10309.

### TOP TEN EASY B

Top Ten Easy B consists of the Postal winners each year, with a new listing beginning at the end of the Postal. For the remainder of the year, fliers may "bump" into the Top Ten by submitting flight times higher than existing times in the Top Ten.

	Time	Ceiling	Fudge	Score
1. Hal Crane	593.0	20.2'	1.318	733.9
2. Bob Platt	583.0	20.2'	1.318	721.9
3. Fudo Takagi	471.5	22.3'	1.253	583.5
4. Mike Thompson	349.0	20'	1.323	431.9
5. Bob Leishman	288.0	18'	1.394	401.5
6. Ted Katsanis	215.0	20'	1.323	266.1
7. Phil Fudo	188.0	20'	1.323	232.7
8. Joe Skraba	65.0	20'	1.323	80.4
9. Jason Katsanis	51.0	20'	1.323	63.1

### PROPELLER SELECTION

by John Schauble

Say you have a Peanut Scale airplane with one of the little plastic propellers, and you have exhausted its potential for endurance by getting it precisely trimmed and by lots of experimenting to find the right size rubber motors. What should be done next to get more performance? The classic answer is to install more rubber and increase the propeller power handling capability. A rule of thumb (and some pretty fancy mathematics) says that performance should increase with added rubber until the rubber weighs as much as the airframe, or beyond.

Now this rule works when the airplane can handle the power, and the airplane is optimally trimmed for the new condition. Both conditions are substantially more difficult to meet if the amount of change is large, especially in Peanut. Here the aircraft form follows full scale, which may not be (usually isn't) ideal for handling power without a pilot. So what should one do?

Let's try to derive some common sense rules. First, we want minimal increase in thrust to minimize trimming problems, and maximum increase in duration of run for long cruising flight. This can be achieved by increasing the prop size relatively more than the motor size so that

thrust doesn't change with the bigger motor. (Perhaps thrust should increase just a bit to allow for the higher aircraft weight).

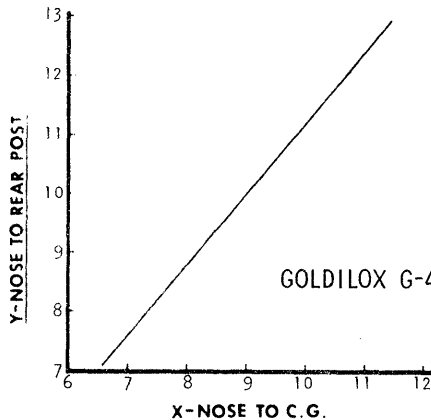
To achieve this result, increase the prop diameter in direct proportion to the area change of the rubber. For example, if your model flew well with .070 x .040 Pirelli, and you want to upgrade to .090 x .040, the prop diameter should increase by  $(.090 \times .040) / (.070 \times .040) = 1.28$ . Thus, a 6" diameter prop would increase to approximately 7 3/4" diameter. The bigger prop would give about the same thrust and minimize retrimming while giving a longer run because it will turn slower.

This rule ignores some factors, and should be regarded as a starting approximation. Be ready to make further adjustments by changing rubber size or clipping propeller tips. Also be careful of CG shift due to the heavier rubber. Ballast if necessary to restore the original CG.

Note: The above has been reprinted from GLASTONBURY MODELERS NEWS, edited by George Armstead. Thanks!

### STATE OF THE ART

Goldilox G-4 is another in Stan Chilton's fine series of beautiful models. It set the FAI Cat. III record of 26:45 at the first session in the American Airlines hangar at Tulsa (South Central Semi-Finals), with room to spare. Besides the extra thick airfoil (Stan uses taut film which slightly reduces average camber), a feature not immediately apparent from the drawing is adjustable tail incidence. This is accomplished by mounting a socket on the end of the tail boom; the tail bracing post moves in the socket for incidence change. The long, lean look of the model coupled with Stan's trim (-3% CMOS; +6% INP) makes a very efficient model.



### PENNYPLANE REBUTTAL

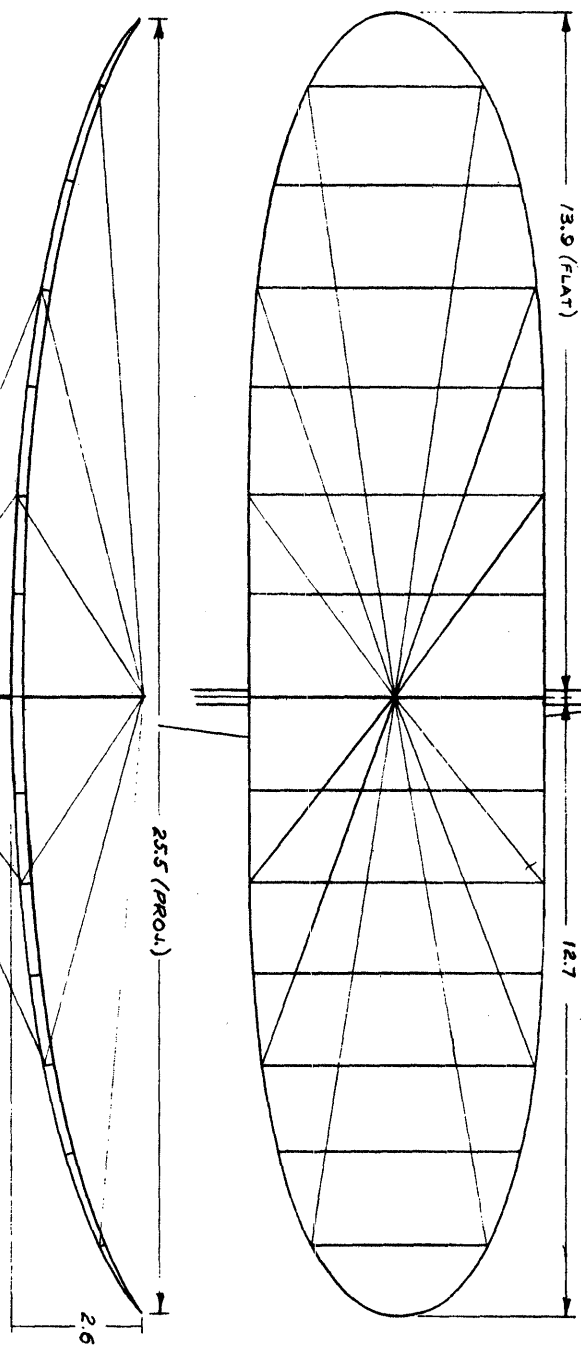
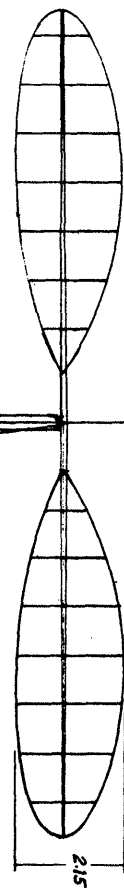
Bob Clemen's remarks and my rebuttal in the April '74 INAV brought forth some other comments:

Manny Radoff: PennyPlane, its predecessor Easy B, and any subsequent events are all doomed to be taken over by the experts. It is inevitable. There is no such thing as a fun model airplane if you are going to compete in a contest. The only fun in it is your fun of competition. If you are looking for a novice model airplane, you are groping in the dark without a candle. There ain't no such thing! There is only a novice model builder. You can't legislate or formulate a novice model - only a novice modeler. So if you want simple, easy, uncomplicated models, specify that only novices can enter. Novices can be defined. Define them as non-winners ever, in a contest. Second or third places only. One-time winners. Make it consistent. Thereby you will have a fun event with a novice built model and flown by a novice. CAUTION! No matter what your novice rules are, you will soon exhaust the supply of novices in the local area. SECOND CAUTION! Who is going to keep track of novice and expert modelers? Skipping all the other problems, if you go to the Nats with a "novice" event, do you just want to fly or compete once a year, after all the local talent has been used up? Think about it, fun modelers.

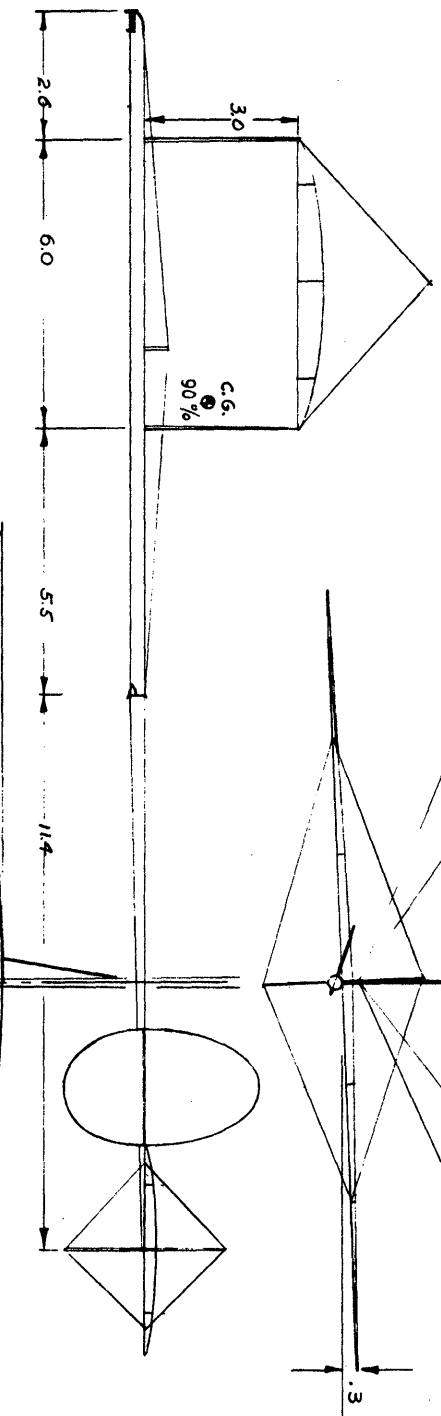
To paraphrase Gertrude Stein: A contest is a contest is a contest. Did she also say "A rose by any other name would smell just as sweet?" A contest is a competition. Somebody wins. If you object to the other guy wanting to win, and so building and designing a better model, give up competition and become what is known as a Sunday flier. President Truman put it very succinctly: "If you can't stand the heat, stay out of the kitchen!"

Otto Curth: In my opinion, the same "experts" will win any event because they expend energy (i.e. work at it) on

PROP - 17/30  
 POWER - .052 x .041 x 18 1/2  
 PIRELLI



CHILTON AIRFOILS PER  
 HACKLINGER REPORT

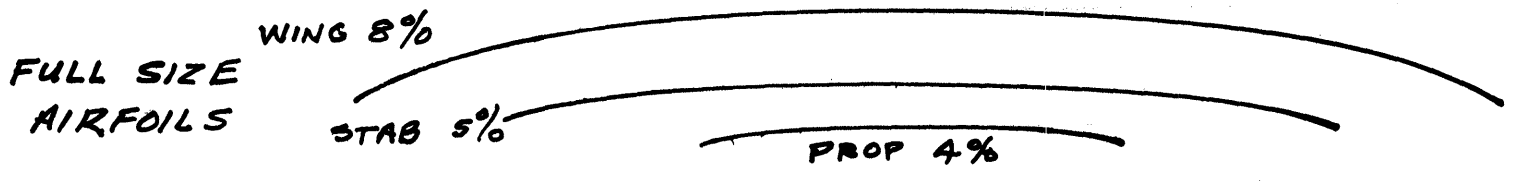


GOLDILOX - G4 - (1969)

WEIGHTS :

WING	.013
STICK & TAIL	.018
ROP	.007
TOTAL	.038

BY STAN CHILTON  
 RECORD TIME FAI CAT. II - 26:45 7/1/73 TULSA A/A HGR.



FULL SIZE  
 AIRFOILS

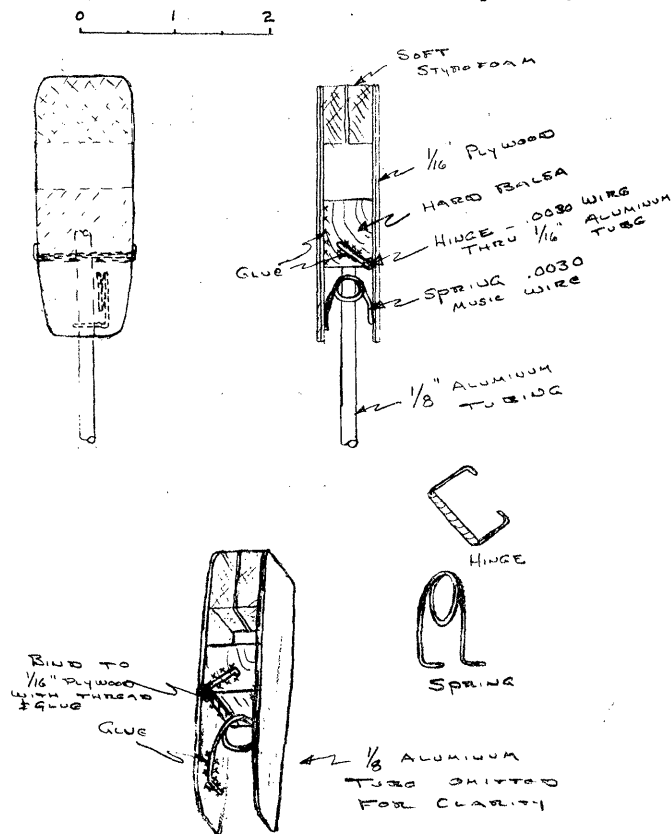
the event; that's what competition is all about, isn't it?

Fudo Takagi: I'm inclined to agree with Bob Clemens on the 4" chord bit. However, I don't agree with him on limiting covering to tissue, or on solid sticks. If a person wants to use carbon fibers, spider webs, etc., more power to him. I covered one with garment bag material; worked OK. A compromise would be to have two categories: Super Penny-Plane with the present rules, and Penny Fun Plane for the not-so-expert and fun fliers. The Fun Penny could use the 4" chord limitation, or also require Peck Polymers new 9 1/2" plastic prop and keep the other rules "as is".

Clarence Mather: I would like to see rules that produce models of better proportion and simpler construction. Yes, it will complicate the rules a bit but it seems to be a fact that simple models require detailed rules! I suggest limiting the area to 75 sq. in. or else 4" chord as Bob suggests. I prefer the area rule because it allows more variety of design - I believe that a square tip will fly as well as an elliptical one. Paper Stick has an area rule and it has been no problem to conduct the event. The smaller area allows the rest of the model to be built of heavier wood or solid stick, etc. I see no need to specify materials as the 1/2 weight takes care of advantages due to extra quality wood, etc. Microlite and other thin plastics have the great feature of not shrinking and warping the model. I would also like to see the rubber limited to 1/2 weight. I think that the monster props would no longer be needed - I could be wrong, though! I feel as does Bob that we need events where hollow sticks and booms are not required. I still find the present rules a fun event, but we need one for simpler models.

#### HINTS AND KINKS

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



Two From Otto Curth

Microlite often is difficult to handle because of a heavy static charge. Mount the microlite on a frame, then

run hot water in a shower stall or tub until the air is laden with steam. Pass the microlite thru the steam and the static will leave, giving limp film.

Steel strapping such as is used on heavy packing crates makes a very handy straightedge. Put masking tape on the back to make a non-skid surface.

#### Pour Uniform Microfilm

Paul Allen suggests a way to learn the smooth pouring stroke necessary for uniform sheets of microfilm. He lays an aluminum angle lengthwise across the tank, and has the angle measured into equal sections with contrasting marks. A metronome gives him a cadence beat, so that his pouring motion is timed uniformly. For thinner film, he speeds up the metronome; for thicker film a slower beat is used. In addition to the metronome, Paul also uses a standard type pouring spout with interchangeable orifices.

#### CONTEST RESULTS

M.I.A.M.A Indoor Contest, Jan. 20, 1974, Cat. II  
Goodyear Blimp Hangar, Opa Locka Airport, Miami, Fl.

Peanut Scale		Indoor Scale	
1. John Martin	235.3	1. John Martin	1:22.3
2. Bill Hiscock	169.8	2. Gary Myers	1:15.6
3. Gary Myers	131.0	3. Fulton Hungerford	1:20.8

Junior Easy B		Open Easy B	
1. Rick Myers	6:09	1. Jim Stewart	9:37.9
		2. Gary Myers	9:14.1
		3. Russ Dorsey	3:44.5

Junior PennyPlane		Open PennyPlane	
1. Rick Myers	6:05	1. Gary Myers	6:30
2. Charles Slater	3:08	2. Jim Stewart	6:15

Open Endurance		Open HLG	
1. Gary Myers	9:38	1. John Arthur	98.9
2. Jim Stewart	7:51	2. Gary Myers	89.4

Winged Motors Indoor Meet, Feb. 23, 1974 Cat. I 20.5'  
Kansas City, Mo. area

Indoor Scale		Junior Rubber	
Dick Stamm	82 points	Mike Douglas	177 sec
John Krekovich	77	Chris Conninellis	108
Cecil Davis	77	Frank McCall	80

Winged Motors Indoor Meet, Mar. 16, 1974 Cat. I 20.5'  
Kansas City, Mo. area

Easy B		Open Stick	
Roger Schroeder	7:12	Bill Langley	8:24
Bill Langley	7:01	Walter Lounsbury	7:57
Carl Perkins	4:59	Roger Schroeder	7:18
Kevin Wehner	4:42		

No Touch Award - 6:30, Walter Lounsbury

Thermaleers FLY IN, Mar. 10, 1974 Cat. I  
Fort Zumwalt, Mo.

Jr-Sr Easy B		Open Easy B	
Doug DePaul	5:48	Dick Hardcastle	7:36.8
Allan Brittle	3:46.4	Chris Matsuno	5:32
Bent Humphries	3:18	M. DePaul	5:08

Jr-Sr HLG		Open HLG	
Doug DePaul	34.8	Dick Hardcastle	61.2
Bill Martin	24.8	Chris Matsuno	58.8
Erik Schwan	11.2	Paul Tryon	54.8

Jr. AMA Cub		Indoor Stick	
Chris Potts	38	Dick Hardcastle	5:47.8
Mary Cook	30	Paul Tryon	5:14.2
Tim Potts	30	M. DePaul	2:39

Peanut Scale			
Conrad Ruppert	153	Stinson Voyager	
Dick Hardcastle	142	Pilatus Porter	
R. E. Peters	73	Pietenpol Air Camper	

# INDOOR

## NEWS and VIEWS

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

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

### New Members!

ERNIE J. CLARK, 2601 NE 9th Ave., Pompano Beach FL 33064  
 ANDY deMELLO, 100 Leeward Glnwy, Apt. 1701, Don Mills,  
 Ontario, Canada M3C 2Z1  
 MARK DRELA, 222 Barry St., Philadelphia PA 19111

### Change of Address

DAVE LINSTRUM, 2023 Woodleigh Dr. W, Jacksonville FL 32211  
 ph. 904-725-8856  
 STEPHEN FAUBLE, 522 Mullins, Lewisville TX 75067

### Paul Harvey!

Most people know that Paul Harvey is a radio and TV news commentator. Those who listen to him regularly are aware that he almost faithfully finishes each broadcast with something on a lighter note - something to give a chuckle or brighten our day. Faithful listeners are aware that Paul is a member of AMA, and a member of an AMA Chartered Club, and that he gives AMA and modeling a boost in his cheerful and unabashed style. If you don't listen to his program, you are missing one of the most non-partisan, common sense, plain speaking commentators ever to speak in the media. At least once a week, there is some new insight - something undoubtedly true - presented with such clarity of thought that it glows. An example, which is an approximate quote: "Don't let any politician buy your vote with a promise to lower your taxes by raising the taxes of others. Big Business doesn't pay taxes - people pay taxes - all corporations pass their taxes on to people with increased prices."

So, thanks to Paul Harvey! He gives modeling a plug with perhaps the widest coverage achieved by any of those who tell our story. All modeling activity thereby gains in stature as more people hear our story.

### Double Oops!

No one has shot me yet, but three high-placing entries in the NIMAS Postal were buried in my briefcase and only came to light two weeks after the May '74 issue was mailed out. The revised listing appears below, followed by a revised listing of Top Ten Easy B.

<u>Jr. Class I HLG</u>	<u>Time</u>	<u>Ceiling</u>	<u>Fudge</u>	<u>Score</u>
Scott Wisniewski*	57.6	22'	1.136	65.4
Mark Grayson	39.0	20.2'	1.238	48.3

### Open Class I HLG

Dick Hardcastle*	62.7	22'	1.136	71.2
Bob Leishman	38.7	18'	1.39	53.8
Philip Walden	40.0	20.2'	1.238	49.5
Chalrly Learoyd	45.0	25'	1.0	45.0

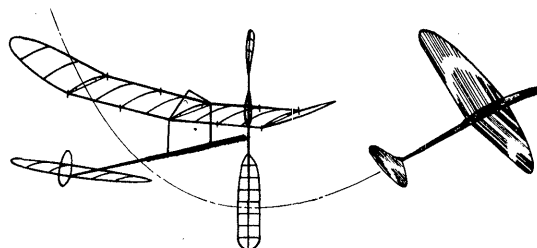
### Open Easy B

Dick Hardcastle*	634	22'	1.261	739.4
Hal Crane	593	20.2'	1.318	733.9
Bob Platt	583	20.2'	1.318	721.5
Fudo Takagi	471.5	22.3'	1.253	583.5
Gordon Wisniewski*	433	22'	1.261	546
Mike Thompson	349	20'	1.323	431.9
Bob Leishman	288	18'	1.394	401.5
Ted Katsanis	215	20'	1.323	266.1

### \*New Listing

### TOP TEN EASY B

1. Dick Hardcastle	634	22'	1.261	739.4
2. Hal Crane	593	20.2'	1.318	733.9
3. Bob Platt	583	20.2'	1.318	721.5
4. Fudo Takagi	471.5	22.3'	1.253	583.5
5. Gordon Wisniewski	433	22'	1.261	546
6. Mike Thompson	349	20'	1.323	431.9
7. Bob Leishman	288	18'	1.394	401.5
8. Ted Katsanis	215	20'	1.323	266.1
9. Phil Futo	188	20'	1.323	232.7
10. Joe Skraba	65	20'	1.323	80.4



### '74 Nats

All fliers who have made proper entry and received a Nats ID tag and bumper sticker from AMA Hq can go directly to the indoor site, don the ID tag, and present models for processing when ready to fly. If anyone has an entry discrepancy (the letter from Hq will note details of any such discrepancy), he must first report to the AMA desk at the indoor site to resolve the matter.

All trophies won at the high ceiling site (Goodyear Blimp Hangar, Spring, Texas) can be claimed there each day after finish of the day's events. Trophies won at the low ceiling site (Lake Charles Civic Center Sports Arena, in downtown Lake Charles) will be available at the Trophy Cage at Chennault Airbase, along with trophies from other events.

Indoor HLG will use the "time sharing" concept in use at all recent Nats - half-hour periods of test flying alternating with similar official flying periods. Also, the time-a-flight-fly-a-flight system will be used, where each contestant or his helper will time a flight before the contestant will be allowed to have a timer again. Note: official flights may be made during test flying sessions at the option of the contestant, but no testing will be permitted during official flying sessions.

Table rental at the workshop area on base can be handled at the AMA desk at the Goodyear Hangar on Aug. 4 or 5; otherwise the supply may be exhausted before indoor contestants reach the base on Aug. 6.

### NIMAS Awards

SILVER CAT. II RUBBER - 20:27.0, Richard Doig

GOLD CAT. II HLG - 0:56.4, Richard Doig

### FAI INDOOR REPORT

#### Team Practice Session

Team Manager Dick Kowalski made the following report to AMA Hq on the May 18-19 team practice session:

The team assembled at Philadelphia International Airport and motored to Lakehurst without difficulty. Test flying on both days was spirited but yet prudent due to the nearness of the WCh. During prior team discussions, it was decided that competitive team flying at this late date would be hazardous. Consequently, our strategy was to fly aggressively, but to restrain our "pressing" to a point where models might be lost or damaged. In spite of this conservative atmosphere, the team members made good individual flights as follows: Cailliau - 34 min., Servaites - 36 min., Stoll - 35 min.

In view of the atmospheric conditions which prevailed (good but not excellent), it would appear that we have a potentially strong and competent team for 1974. Harmony, rapport and morale among team members is excellent. In the manager's personal opinion, it is felt that we have the full potential to win or at least place very high in the Team Standings at the WCh.

#### World Champs Entrants

Barring possible entries delayed by international mail delivery schedules, the following list can be considered to be final with regard to the Indoor WCh: (managers listed last)

CANADA	CZECHOSLOVAKIA	ENGLAND
Andy deMello	Karol Rybecky	Laurie Barr
Jack McGillvray	Jiri Kalina	John Blount
Mike Thomas	Eduard Chlubny	Reg Parham
	Otakar Saffek	Butch Hadland
FINLAND	GERMANY	ITALY
Pentti Nore	Horst Tiemann	Fernando Migani
Harro Erofejeff	Werner Wetzel	Carlo Cotugno
Harri Raulio	Herbert Langner	Adalberto Frioli
Harro Erofejeff	Gunter Malbaum	

JAPAN	POLAND	SWITZERLAND
Shigeyoshi Nonaka	Edward Ciapala	Dieter Siebenmann
Junichi Sakoda	Sylwester Kujawa	Werner Heise
Toshiaki Minagawa	Ryszard Czechowski	Francois Tapernoux
Shigeyosha Nonaka	Zdzislaw Szajewski	Hans Reifler
AUSTRALIA*	NETHERLANDS**	
Boyd Felstead	Cornelis Wolthoorn	

\*Boyd will send models to be proxy-flown by Manny Radoff, with John Triolo as manager.

\*\*Hank Dekat (Toledo, Ohio) will serve as manager for the Netherlands.

CONTEST CALENDAR

CALIFORNIA - Santa Ana  
Indoor Record Trials June 22-23, 1974 at Santa Ana MCAF. Contact Bob Randolph, 25145 Lawton Ave., Loma Linda CA 92354.

NEW JERSEY - Lakehurst  
Indoor contest at Lakehurst on July 21, 1974; Indoor Stick, Easy B, HLG, Peanut Scale and PennyPlane. Contact Sal Cannizzo, 20 Outerbridge Rd., Staten Is. NY 10309.

NEW YORK - Long Beach  
Cat. I indoor contest on July 28, 1974 at Nassau County Arena, Long Beach, L. I. NY. HLG, Easy B, Peanut Scale, Indoor Stick, Indoor Scale. J. G. Pallet, 30 Emerson Rd., Brookville, Glen Head NY 11545.

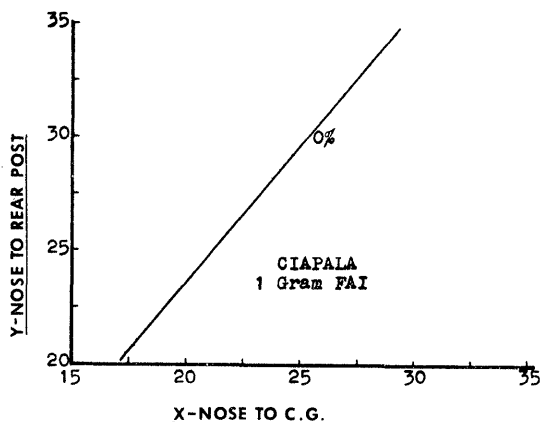
RECORDS? MAYBE!

LAKEHURST FLYING SESSION, May 19, 1974, Cat. III  
Junior Helicopter - 3:24.8, Joel Foner

Glastonbury Modelers Cat. I Record Trials, Feb. '74  
Senior HLG - 1:13.5, George Armstead III

STATE OF THE ART

Edward Ciapala's one gram FAI returned an enviable performance on the flight which now holds the Cat. III Record at 33:34, and the site record at Kossuth University in Debrecen, Hungary. When one considers that the previous site record was 32:42, set in 1966 by Hans Beck at the '66 WCh, this performance doesn't come into proper perspective until one realizes that Hans Beck's flight was made with an unlimited 90 cm model. Also, the site must be considered - the roof is a stained-glass semi-dome which is almost impossible to scrub safely. No word was received to indicate whether the model did contact the ceiling, in spite of the ceiling probe shown. At any rate, the model was trimmed "right down the middle" (+6% CMOS, +11.7% INP) and logically would be good in ceiling contact situations.



PENNYPLANE REBUTTAL

Erv Rodemsky and Charlie Sotich were two of the prime movers in popularizing PennyPlane, and Erv is generally regarded as the "inventor" of the event. So, it is fitting that both these should add their thought to:

THE GREAT PENNYPLANE DEBATE

by Erv Rodemsky

I'd like to add my two cents' worth (no, not another class!). The original intent was to have an event that was simple to build, could achieve reasonable performance, and be a challenge to beginner and expert alike. It doesn't matter what kind of rules you write, the best man will usually come out on top. The only way to prevent a good guy from consistently winning is to (a) disqualify a man after a certain number of wins, (b) use a handicap system

(cumbersome, hard to administer), or (c) step on his models. Let's face it. The best man will win no matter what the rules. The reason I stayed away from a max wing chord rule is to keep all models from having square wing tips. The rules obviously allow originality while keeping the models easy to build and handle.

As I see the problem of PennyPlane, a beginner will try to build a copy of the "expert's" model with discouraging results. So a great deal of thought has been given to a breakdown of classes. A novice could be told to keep everything within reasonable limits by specifying, in addition to the present rules, a max wing chord, max stab span and chord, solid motor stick and boom, and max prop size. This, in effect, would be a "one design" contest, except that wing tip shape and height would still be optional. BI-planes would be OK. Covering would still be your choice (the original PennyPlane was covered with Saran Wrap), the great equalizer being the weight rule.

As to regular PennyPlane, I'm not sure that over 6" chord does any good. Dennis Jaecks used 8" last year, but he admits that it was no real advantage. I believe Larry Cailliau was close behind with a much higher aspect ratio. As a matter of historical interest, Chuck Markos won the first PennyPlane contest with a 5" chord round wing tip design. And, as far as "experts" are concerned, I believe a careful check will reveal very few "names" that have ever won PennyPlane contests. Jaecks seems to have developed most of his skill by flying the event. His design objective was to build a ship that would be able to carry around three grams of rubber effectively - that meant a lot of wing area, wing offset, washin and a big prop.

One opinion that I hear over and over is "keep the rules simple." However, if it is a choice between a simple airplane regulated by hard rules, or a hard airplane with simple rules, give me strict rules, especially for beginners. The answer for beginners with a complicated set of rules is to provide full-size plans or kits that meet all the regulations. Once a flier gets the most out of the limited class, let him fly against the "big boys".

As the rules were originally written, this class has grown steadily in popularity. The April issue of INDOOR NEWS AND VIEWS showed half the scheduled contests with PennyPlane included, and the event is being flown in England, Italy, the Netherlands and other countries.

We in the Oakland Cloud Dusters are proposing that PennyPlane be adopted as an official AMA event, with suggested extra limitations for a novice class. If anyone has any ideas along these lines, I would appreciate hearing them and they will be considered in the official proposal. (Note: Erv's address is 1624 St. David Dr., Danville CA 94526, ph. 415-837-3314.

THE PENNYPLANE EVENT

by Charlie Sotich

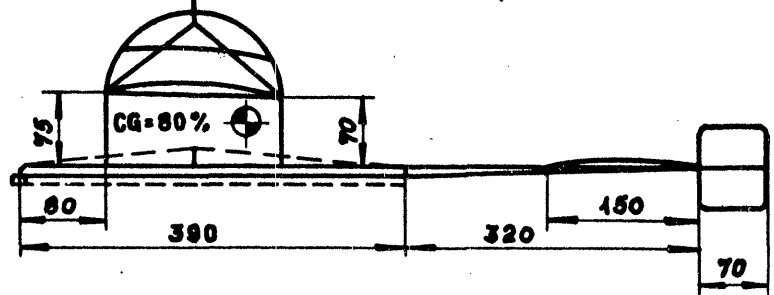
Should the PennyPlane rules be modified to make it easier for beginners? Bob Clemens suggested limiting (1) the wing chord to 4", (2) the covering material to Japanese tissue and (3) requiring solid motor sticks. Putting these or any similar restrictions on the model design or construction is not going to enable the novice or once-a-year flier to beat Dennis Jaecks. If you want to win in any event you have to work at it. Winning in a raffle where everyone has an equal chance is just a matter of luck, not skill. If you want to let the beginners have a chance of winning you should restrict the event to beginners.

My personal feeling is that the present PennyPlane rules as written by Erv Rodemsky are very good for a beginner event but they are also a challenge to the experts. The model size is reasonable, not big and clumsy or small and delicate. The weight requirement allows a sturdy model to be built. It can be braced if necessary, yet ultralight wood or covering isn't a necessity. Many unusual designs have appeared during the past few years. The models all are generally very simple and easy to make and yet are extremely rugged. These models can be kept flying for years, not just one or two flying sessions. The best thing about them is that most of them fly well and encourage their builders to continue building and flying.

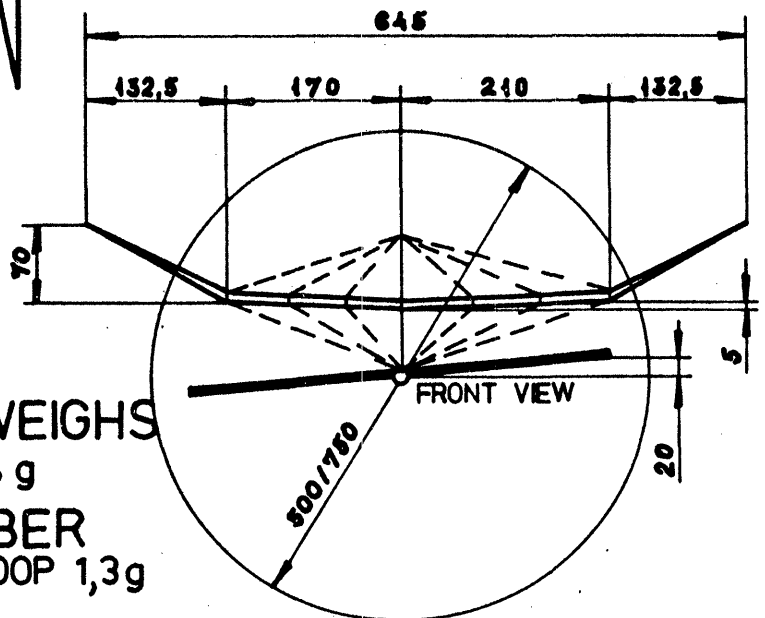
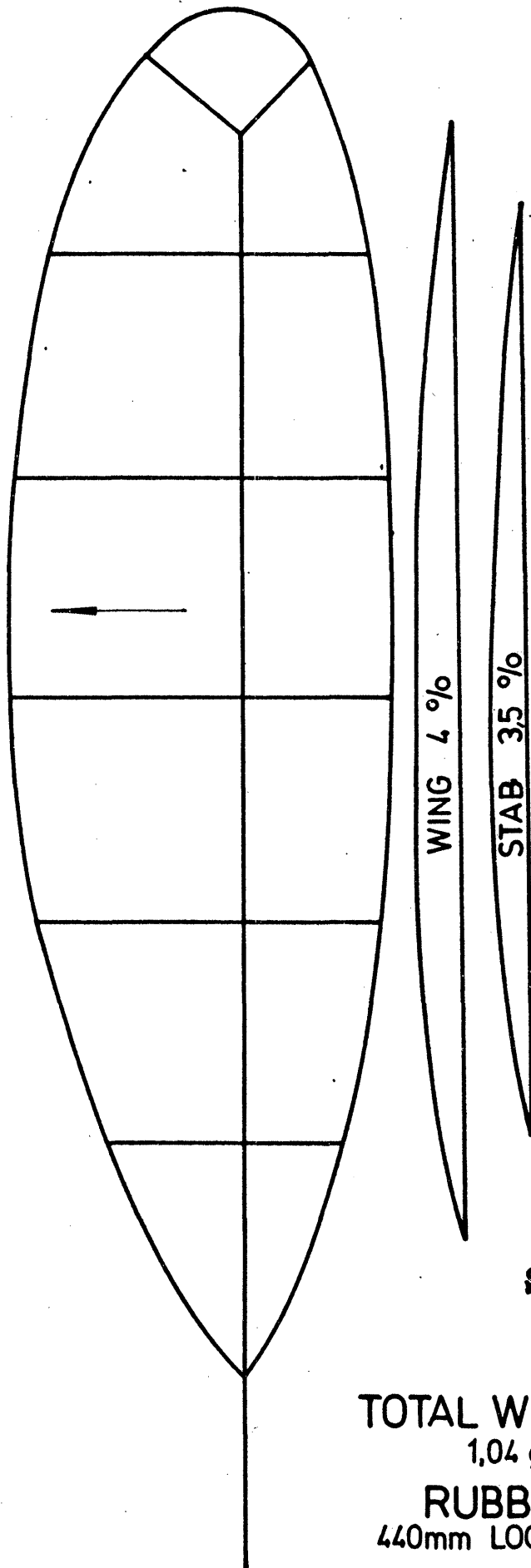
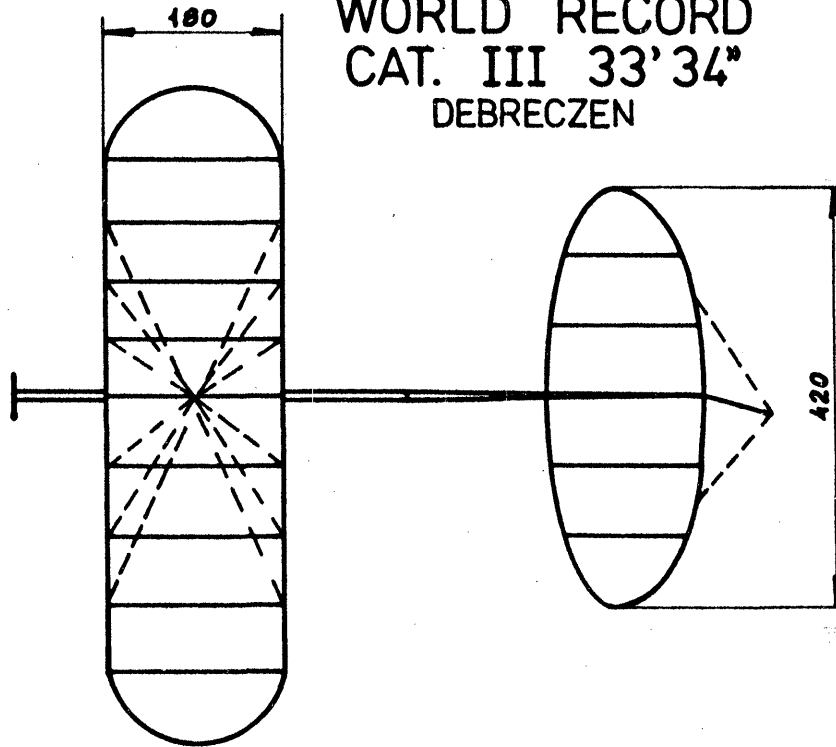
The Easy B event also started out for beginners, but it didn't last. Bracing is not allowed, and there is no minimum weight rule. This makes careful wood selection a must to get a light model that will stay together. Beginners usually don't have good wood available and don't know how to pick the wood for best results.

The one way to have a real beginner event is to restrict the competition to beginners. Let the experienced indoor fliers stay in the traditional classes of microfilm

FAI 1 GRAM  
EDWARD CIAPAKA  
POLAND



WORLD RECORD  
CAT. III 33'34"  
DEBRECZEN



TOTAL WEIGHS  
1,04 g  
RUBBER  
440mm LOOP 1,3g

and paper covered models. There are enough indoor events now to keep most indoor modelers busy building and flying. If the beginners are able to fly and compete against other beginners they wouldn't be so unhappy after a contest when they compare their times with the winners.

Instead of looking for new events to encourage the beginners we just need to restructure our competition classes. We now use the contestant's age to classify the competition. If a system could be devised using skill levels it might provide a fairer form of competition and it could be used as an incentive for the newcomers to try to move out of the beginner class to one more advanced. If the RC Pattern flyers have been able to develop a workable system of competition for novice and expert flyers, I think that indoor flyers can do it too.

INDOOR MODEL TRIM PROCEDURES

by Clarence Mather

I was asked to describe procedures for preparing a model for competition in low and medium sites and for world championships. The first step is to build the model with the proper washin and offsets and to have the proper wing location. Beginners are urged to stick with proven designs such as are published here in INAV. The CMOS wing location method (Jan. '73 INAV), is recommended for original designers, and the balance chart furnished with INAV three-views should be used when building these designs.

Most indoor fliers have limited access to suitable indoor sites and there seldom is enough time for complete testing. Fortunately, a considerable amount of testing can be done in the home by releasing a fully wound model near the floor of a living room and catching it at head height a few seconds later. This sounds hazardous, but I cannot recall ever damaging a model this way, in spite of being somewhat clumsy. Generally, the testing room should be large, but freedom from drafts, cats, dogs, children, etc., is also important.

Indoor testing can be considered in two parts. First, determine if the model is strong enough, is balanced properly, and has the correct washin and offsets. The second involves selecting the best combination of propeller and rubber for the flying site.

Assemble the model and lube a motor slightly wider than that expected to be used in competition. Wind the motor to about 50% of full turns and launch the model slightly nose high. The model should climb slightly (the motor is oversize, remember) and show a definite turn. Even in a small room, the circle diameter can be estimated quite accurately. Circle size is somewhat a matter of choice, but 20'-30' is the common range. If the flying site narrows at the top a smaller circle is desirable. Adjust the rudder offset until the desired turn results. Stalls or dives can be cured by changing wing incidence.

Next, increase the number of turns in the motor about 80% of maximum and again fly the model. The circle should be as before but the climb should be very definite. Stalls can be removed by decreasing wing incidence, but if the turn is gone study the model carefully in flight. The wing may be twisting due to loose bracing wires or it may be too weak; the motor stick may be bending to the right. Joe Bilgri has remarked that a larger rudder helps keep a model in a turn under higher power; if turn problems persist try a larger rudder. Floppy wing tips may need bracing for rigidity. Additional wing spar brace wires can stiffen a wing, but sometimes a stronger wing must be built.

When the model flies well on 80% power, give it full turns or very nearly so. Many models that do well on partial turns develop all sorts of problems on high power. It is better to discover this at home and solve the problems than to have them show up at a contest!

A rough idea of how high a model will climb on a particular propeller-motor combination can also be found by home testing. Launch the fully wound model near the floor and catch it at a predetermined height. Stop the prop as you do so. Return to floor level and launch again; repeat this until the climb ends and add up the total height gained. The accuracy of this method depends upon how closely the home air matches the temperature and humidity of the air in the flying site. Cold air is more dense and harder to penetrate than warm air; the rubber will also develop less torque when cold. A larger motor or smaller prop will be required to produce the same altitude in cold air as in warm. Humid air is less dense than dry air but wood tends to absorb moisture so models gain weight in moist air. The rubber seems to develop less torque also, but this is probably an illusion since rubber is water-proof?? Anyhow, larger rubber is often needed in humid air. The air temperature usually changes as the day progresses; getting warmer from the roof down due to the sun

heating the roof. A motor that barely gets a model to the roof in the morning may cause the model to hang up late in the day. Sometimes there are air currents to compound the problem and the result is that experienced fliers choose where and when to launch as in outdoor competition!

For flying in low ceiling sites, use a smaller and shorter motor than was used in higher ceilings. Probably no two fliers will agree, but a motor weighing slightly more than the model works best for me in sites with cluttered roof so that ceiling bouncing is risky. If the roof is smooth a larger motor would be in order - I have never flown in such a site, but from all accounts this is so. Some fliers prefer a motor just able to take the model to the ceiling with full turns (speaking of cluttered ceiling again), but most of us use a heavier motor fully wound and then back off turns to the proper level before launching. Medium ceiling sites require more of the same - the motor will be slightly larger and longer than for the low ceiling site - only extensive testing can show which size of rubber is best for a given model and prop any given day. With extensive advance testing, it is possible to minimize the testing needed on contest day.

INDOOR ELSEWHERE

The Romanian Nats were held at Slanic of Feb. 8-10, 1974, with 42 competitors counting juniors and seniors. Conditions were reported as "normal" - probably good.

1. Aurel Pops	35:36	36:41	72:17
2. Eugen Holtier	34:31	36:25	70:56
3. Aurel Meararu	34:33	36:25	69:31
4. Gheorghe Sora	29:37	33:26	63:03
5. Tudor Lungu	31:20	29:35	60:55
6. Otto Hints	27:59	31:32	59:31
7. Mihai Teut	30:50	26:23	57:13
8. Dorel Pora	28:14	28:30	56:44
9. Vasile Nicocara	27:30	28:09	55:39
10. Nicu Bezman	28:50	26:25	55:15

A CHANGE OF PAGE

Dear Bud,

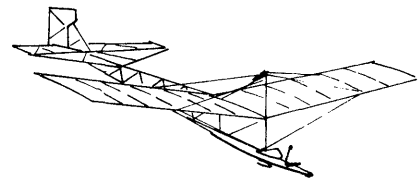
How do you feel about a new\* indoor class? Indoor Towline!! The D C Maxcutors and several other clubs have flown the event recently. The ships have higher performance (if you count duration) than HLG, and they are easier to build and fly than scale or rubber models.

The rules we used were very simple - none - but we found that some wing loading rule is required. We have flown the event for four years, but last year Bill Bigge (who else?) did 2:30 in one flight in the 20' high school gym. So this year we have a rule that the model must carry a U.S. penny. I suspect this will be too much, and that one-half gram would be better for all ceilings.

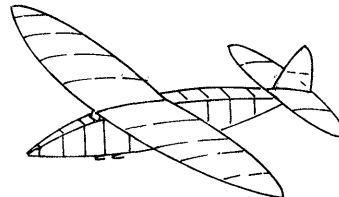
(signed) John Thornhill

\*In point of fact, the event must date from about 1936.

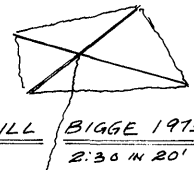
INDOOR TOWLINE



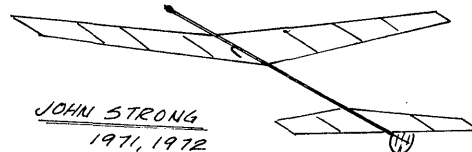
SEMI SCALE FRANKIN  
1970



DUKE FOX  
1937 ZAIC4B.



BILL BIGGE 1973  
2:30 in 20'



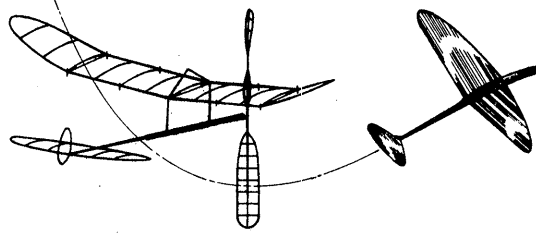
JOHN STRONG  
1971, 1972



# INDOOR

## NEWS and VIEWS

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



### THE 1974 INDOOR WORLD CHAMPIONSHIP

#### Individual Standings

1. Ryszard Czechowski	Poland	34:27	34:50	29:01	<u>34:56</u>	<u>34:53</u>	33:34	69:49
2. Bucky Servaites	U.S.A.	<u>33:59</u>	6:56	33:40	<u>32:44</u>	<u>25:54</u>	<u>33:51</u>	67:50
3. Karol Rybecky	Czechoslovakia	21:51	<u>31:32</u>	14:49	19:39	<u>30:27</u>	<u>35:44</u>	67:16
4. Sylwester Kujawa	Poland	29:45	<u>32:34</u>	9:39	28:26	<u>34:32</u>	9:55	67:06
5. Edward Ciapala	Poland	27:52	31:01	<u>32:49</u>	17:43	<u>34:11</u>	30:25	67:00
6. Pete Andrews	1972 Champ	31:12	20:32	<u>33:56</u>	0:14	<u>32:03</u>	31:10	65:59
7. Eduard Chlubny	Czechoslovakia	22:38	<u>31:23</u>	<u>23:52</u>	28:55	26:47	<u>33:04</u>	64:27
8. Ed Stoll	U.S.A.	<u>30:56</u>	26:07	28:59	8:43	29:01	<u>33:08</u>	64:04
9. John Blount	England	10:41	12:14	0:36	<u>29:01</u>	28:25	<u>33:16</u>	62:17
10. Larry Cailliau	U.S.A.	6:54	8:02	<u>33:31</u>	26:19	13:24	<u>28:45</u>	62:16
11. Jack McGillivray	Canada	<u>29:36</u>	19:15	<u>32:22</u>	12:20	28:54	0:15	61:58
12. Laurie Barr	England	24:41	21:07	<u>28:48</u>	13:58	26:49	<u>32:22</u>	61:10
13. Jiri Kalina	Czechoslovakia	15:05	8:33	<u>33:02</u>	12:35	<u>27:15</u>	26:45	60:17
14. Pentti Nore	Finland	15:06	20:02	<u>28:08</u>	<u>31:43</u>	2:42	26:38	59:51
15. Reg Farham	England	23:48	0:20	21:32	<u>28:20</u>	28:11	29:30	57:50
16. Harri Raulio	Finland	22:00	23:17	<u>31:20</u>	<u>25:54</u>	24:24	25:17	57:14
17. Toshiaki Minagawa	Japan	21:15	<u>27:13</u>	<u>28:52</u>	15:58	21:41	19:13	56:05
18. Andy DeMello	Canada	0:14	6:33	<u>24:35</u>	<u>25:56</u>	15:51	<u>29:07</u>	55:03
19. Carlo Cotugno	Italy	25:29	0:05	17:40	<u>26:16</u>	26:06	<u>28:10</u>	54:26
20. Adalberto Frioli	Italy	7:48	<u>25:22</u>	12:30	15:42	19:32	<u>28:44</u>	54:06
21. Werner Wetzel	Germany	12:53	0:20	<u>27:30</u>	21:10	25:21	<u>26:24</u>	53:54
22. Kurt Vogler	Germany	21:51	22:07	<u>27:06</u>	<u>26:29</u>	8:51	23:55	53:35
23. Harro Erofejeff	Finland	14:48	18:51	19:54	24:16	<u>24:53</u>	<u>27:32</u>	52:25
24. Mike Thomas	Canada	23:01	6:34	13:22	<u>26:48</u>	11:29	<u>24:12</u>	51:00
25. Ferdinando Migani	Italy	19:45	18:54	<u>26:36</u>	7:48	<u>23:44</u>	9:19	50:20
26. Boyd Felstead	Australia	21:55	<u>25:45</u>	16:17	0:05	<u>22:51</u>	17:37	48:36
27. Horst Tlemann	Germany	21:07	<u>23:18</u>	21:35	21:48	<u>24:50</u>	8:38	48:08
28. Dieter Siebenmann	Switzerland	20:45	0:17	15:45	<u>22:00</u>	0:14	<u>22:07</u>	44:07
29. Cornelis Wolthoorn	Netherlands	<u>21:15</u>	<u>21:31</u>	16:17	16:58	12:04	9:26	42:46
30. Francois Taperoux	Switzerland	19:04	14:37	<u>19:29</u>	2:14	12:17	<u>22:29</u>	41:58
31. Junichi Sakoda	Japan	15:13	-	17:36	6:55	<u>20:12</u>	<u>21:37</u>	41:47
32. Shigeyoshi Nonaka	Japan	19:49	15:58	<u>20:16</u>	<u>20:31</u>	16:17	0:04	40:47
33. Werner Heise	Switzerland	6:32	1:19	<u>2:14</u>	<u>14:44</u>	5:46	10:17	25:01

#### Team Standings

1. Poland	203:55	8. Germany	155:37
2. U.S.A.	194:10	9. Japan	138:41
3. Czechoslovakia	192:00	10. Switzerland	111:06
4. England	181:17	11. Australia (1 man)	48:38
5. Finland	169:30	12. Netherlands (1 man)	42:46
6. Canada	168:01	1972 Champion (Andrews)	65:59
7. Italy	158:52		

The 1974 Aerolympics was a six-ring circus, but most indoor fliers didn't see much of the other events. During the Indoor WCh, spectators from Scale, Pylon and Soaring came in to see the indoor flying.

Most of the teams arrived on Monday or before, and an impromptu practice session was set up. Thanks to organization by Bob Hatschek and to Navy cooperation, model storage was possible at the hangar, thus relieving teams with marginal or no transportation of some problems.

During the practice sessions, not much comment was heard about times, and apparently no one was really pushing hard. The hangar doors were open slightly each day until Thursday, and tightly closed thru Sunday. Testing was also allowed each day until beginning of official flying, but the air was cleared at 1 pm for the beginning of each round. Each team was allowed only one set of timers at a time, so that thirteen models was the maximum number that could be flying at one time. Most of the time fewer models were up, and there were few collisions.

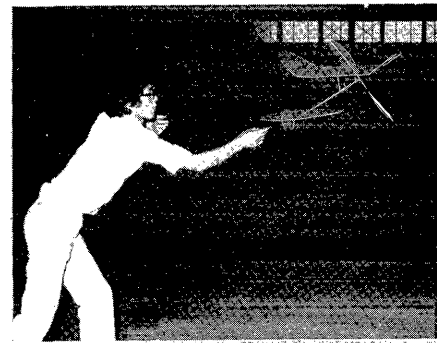
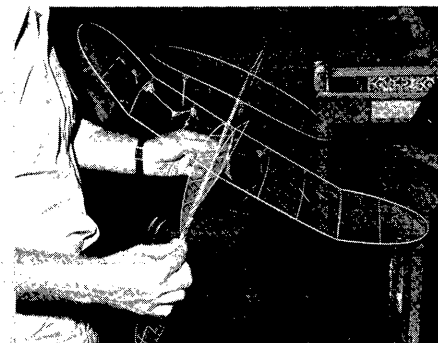
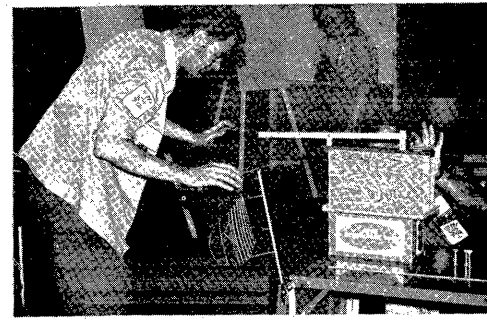
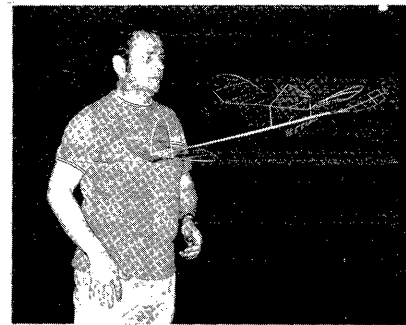
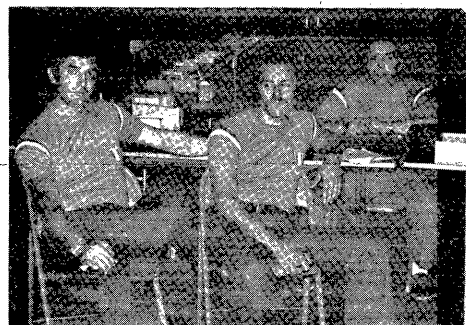
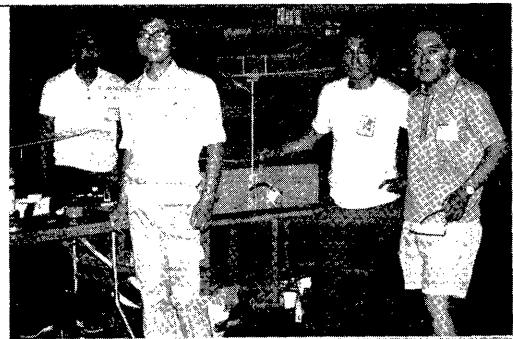
The results sheet speaks for itself - after Round 1, Poland had set a pace that was difficult to approach. Jiri Kalina's first round flight also became a sort of pace setter as it landed neatly and completely on the catwalk - totally non-retrievable except by someone on the catwalk. Navy riggers were available sporadically to get such models down, but mostly one had to depend on spare models until the riggers came. The cause of Jiri's misfortune - persistent side drift - affected many other models during the meet. Some landed cleanly on the cat-

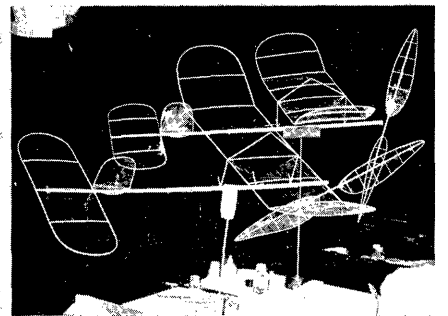
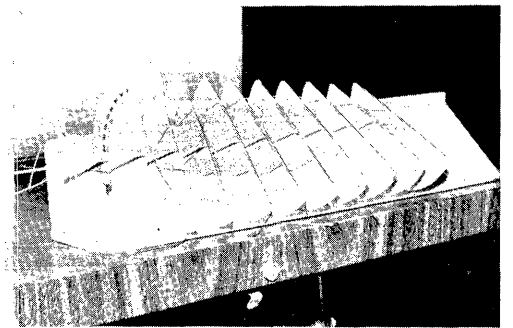
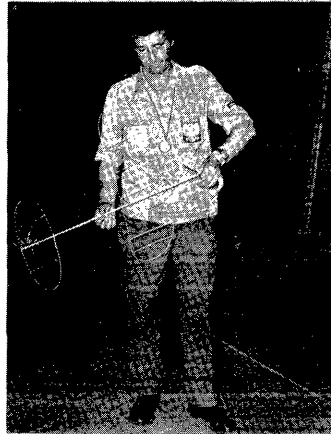
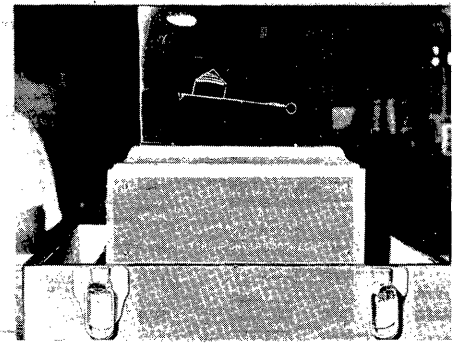
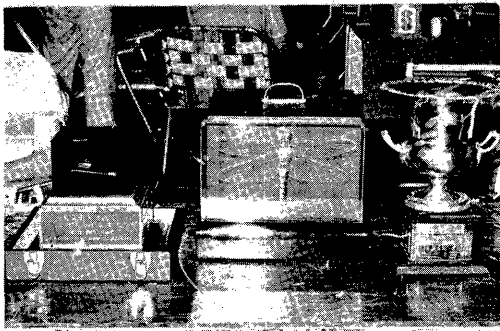
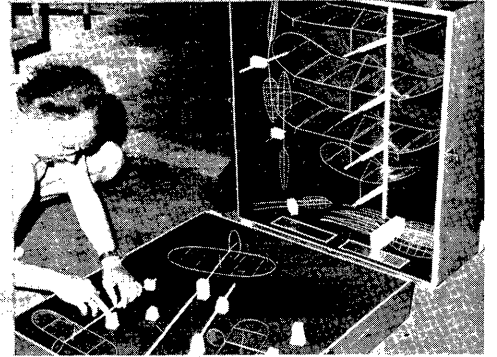
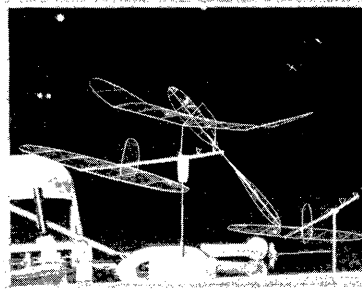
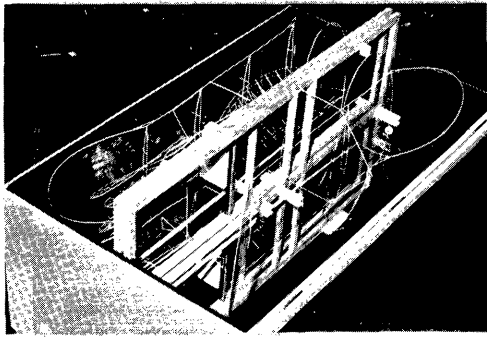
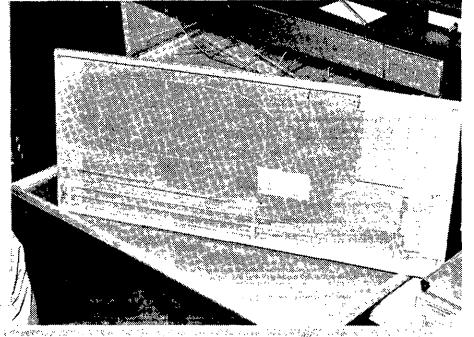
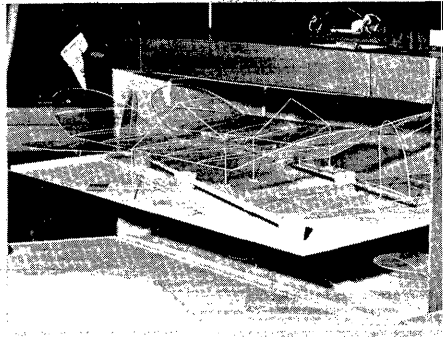
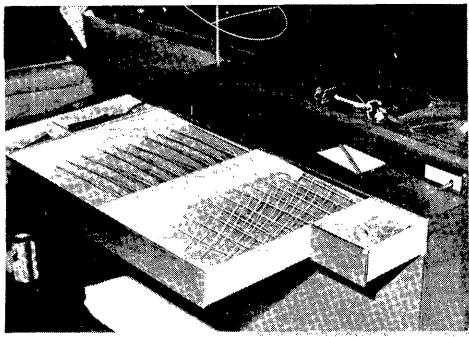
walk, others hung where they could be reached with a balloon and a few went into the side out of sight and out of reach.

At the end of Round 2, it was clear that Poland would be hard to catch; their score was about 6% less than their final total. As the meet went on, every other team added steadily to their score, some almost doubling their Round 2 total as they jockey for position. By Round 3, the U.S. had moved from 4th to 2nd and Canada went from 9th to 6th. Canada's Round 4 rally brought them briefly to 3rd and England's 5th round jumped them from 7th to 4th. Almost every team improved each round, but a few individuals did not get it sorted out until Round 6 or the international meet on Sunday.

The real cliff-hanger was Round 5. A fierce rain blew up 45 minutes before the end of the round, when eight models were up. Instead of isolated drips, the usual result of rain outside, the high winds forced torrents of water inside. Some areas ran like an upended bucket for a startlingly long time, and hundreds of gallons of water landed on the floor. Ed Stoll was lucky - his model got water splatters all over and it came down steeply without damage. Kalina (see photo p. 2) caught his with about 40% loss of film wing and tail, and Frioli had similar damage.

The real heartbreaker was Minigawa's model - it had been well on the way to an expected 30 minute flight. It caught a bucketfull of water right in the middle and came tumbling down all wrapped up and totally demolished. At 19, Toshiaki Minagawa was the youngest entrant; his per-





formance was better than almost half the entrants and the drenched flight could have bumped him much higher.

The International Sporting Code (FAI Rule Book) has a section dealing with rounds interrupted by inclement weather, but the language is totally inappropriate for a rained out indoor event! So, this is one meet where the FAI Jury really earned their way - their decision can be considered a precedent. After the deluge, rain fell intermittently outside and the hangar was dripping until about 11 am the next day. As a result, Round 5 was considered to have 90 minutes left, and was started at 1 pm on Saturday. This forced postponement of the Internats from 1 pm Saturday until 6 pm, and then returning to the original schedule on Sunday.

Another item of interest concerns Eduard Chlubny's Round 4 flight. He began his attempt with an hour to spare, but broke two motors and damaged the model before taking a break. Twenty minutes later, he began again only to lose three more motors before getting off a flight. The motors had been previously tested to full usable turns and were breaking at 50% or less. It was a harried and tense time for Eduard and Dagmar, but they stuck with it like the seasoned veterans they are.

The WCh ran on volunteer help - many dedicated and eager indoor fliers and family members. Thanks to each of these, and especial thanks to some of the visiting indoor supporters from other countries who filled in when things got thin. CD Bob Champine insisted on a thorough briefing for all timing personnel, and spent perhaps 30% of his time giving these briefings. Bob spent many hours in preparation for this event, and many more after the end of flying each day, insuring a successful event. Ray Harlan built the processing scales and span jig, and was assisted in processing by John Kukon and Bob Cowley. "Tex" Hartmangruber was assistant CD and spent hours verifying performance of stopwatches which apparently gave problems of non-agreement between two watches on a given flight. In many cases the trouble seemed to be the reset button on time-out type watches - a slight bump on this stem would cause an error hard to account for. Thanks to all the helpers - it was a good show.

#### The Internats

Beginning as soon as the last WCh official flight had landed on Saturday, the international event featured three events: 65 cm FAI, AMA Unlimited (300 sq. in. max) and FAI Unlimited - over 2000 sq. in. total supporting surface.

The meet itself was almost anticlimactical - almost too informal after the WCh - and the expected 40 minute one gram flight and 50 minute World Record didn't happen. Erv Rodemsky came in with a "coed coffin" containing two - not one, but two models approximately 600 sq. in. big. The first one, which actually was a slimmer, trimmer ship and #2 in the series, caused Czechowski to mutter something that roughly translated "fat cow". Erv gleefully adopted the name, but lost the ship in the wee hours when it cast loose the motor while it still had a lot of turns. The other model, dubbed "Monstro" from the start, flew better on less power even though it weighed well in excess of .1 ounces.

No other truly unlimited models appeared, but Ray Harlan, Dick Kowalski and Ron Plotzke had AMA 300's. Ray's model had showed exceptional promise at the May team practice session; it got caught in side drift on Sunday as did "Monstro". Dick Kowalski made a good 42:30 on Saturday evening, peaking about the time the air started to sink badly. Literally no one of the big ships did well on Sunday; if they were high enough to do good time drift got them. All of them did truly marvelous time for the altitude they reached on test flights - but close only counts in horseshoes!

Several excellent times were turned in in the one gram event, by both WCh fliers and those who came especially for the Internats. Even with the side drift, which was limited to the very top - catwalk and above - the air was clearly better on Sunday than before.

#### 65 cm FAI

1. John Triolo	35:49
2. Dan Domina	35:36
3. Sal Cannizzo	35:31
4. Karol Rybecky	35:08
5. Edward Ciapala	35:01
6. Jiri Kalina	34:56
7. Ron Plotzke	32:44
8. Jack McGillvray	32:44
9. Dick Hardcastle	30:12
10. John Kukon	30:01
11. Werner Wetzel	25:51
12. Andy DeMello	25:44
13. Hal Crane	25:30
14. Dieter Siebermann	24:41

15. Francois Tapernoux	23:46
16. Butch Hadland	23:40
17. Cornelis Wolthoorn	21:31
18. Richard Whitten	20:49
19. Herbert Langner	19:35
20. Kurt Vogler	19:34
21. Bob Platt	18:37
22. Werner Heise	18:06
23. Horst Tiemann	17:08
24. Gunter Maibaum	12:22

#### AMA Unlimited (300 sq.in. max)

1. Dick Kowalski	42:30
2. Ray Harlan	35:36
3. Ron Plotzke	32:44
4. Hal Crane	28:30
5. Werner Wetzel	27:46
6. Bob Platt	25:07
7. Dick Hardcastle	24:35
8. Kurt Vogler	21:55
9. Herbert Langner	17:51
10. Horst Tiemann	17:14

#### FAI Unlimited (2000+ sq.in. max)

1. Erv Rodemsky	32:01
2. John Triolo	27:22
3. Hal Crane	26:25
4. Werner Wetzel	25:09
5. Kurt Vogler	21:46
6. Herbert Langner	20:44

#### THE PICTURE STORY

All photos by Bud Tenny with processing by Kyle Babick, except as noted.

#### Page 2 - Row 1

Left - The Japanese team (1 to r): Junichi Sakoda, Toshiaki Minigawa, Shigeyoshi Nonaka; interpreter Jim Kagawa, NIMAS member from Torrance, California.

Center - Hans Riefler (l), Swiss team manager and Dieter Siebenmann.

Right - (1 to r) Andy DeMello, Jack McGillvray and team manager Lou Leifer, all of Canada.

#### Page 2 - Row 2

Left - Bob Cowley (l) and Werner Heise watch Dieter Siebenmann process his model. Straightedge has vertical threads 65 cm apart; models were processed upside down.

Center - Hank DeKat, Toledo, Ohio, team manager and Cornelis Wolthoorn, Netherlands.

Right - The U.S. team helps Bucky Servaites get off a flight; Ed Stoll holds flashlight on rear hook while Dick Kowalski guards the stab and Larry Cailliau looks on.

#### Page 2 - Row 3

Left - (1 to r) Fernando Migani, Adalberto Frioli and Carlo Cotugno, all of Italy.

Center - Eduard Chlubny, Czechoslovakia, launches his third round flight.

Right - Sylwester Kujawa, Poland passes his test for one gram model weight. Both span and weight processing machinery built for AMA by Ray Harlan. Scale is over-center type, and processing official stabilizes the beam during attaching and removal of the model.

#### Page 2 - Row 4

Left - Andy DeMello and Jack McGillvray prepare to go out for a test flight; white pole held by Andy is one of five steering poles built by Bob Champine for AMA.

Center - Jiri Kalina holds his first round 5 model, washed out of the air by torrents of water. Note shattered film on wing and stab.

Right - Toshiaki Minagawa launches his round 5 flight; the next time he touched the model it was a sodden, tattered wreck as it was enveloped in a cascade of water.

#### Page 2 - Row 5

Left - Larry Cailliau's box top opens to a work table with tools and repair materials stored in top above model compartment; side doors to model compartment were clear to display models.

Center - The Australian team - John Triolo (1) was team manager, while Manny Radoff proxy flew the models sent by Boyd Felstead.

Right - Otaker Saffek (1), Czeck team manager, and Jiri Kalina process Jiri's model.

Page 3 - Row 1

Three photos of remarkable box by Eduard Chlubny; drawers in top hold tools, props and packaged motors. Two slide-out shelves each mount two complete models, with isolation between compartments preventing loose parts from one compartment from entering the other compartment. Two more covered models are stored flat inside false bottom and doubled door. Entire box was built from cardboard when plywood was unavailable, but with such careful engineering that it was light and rigid enough to deliver the models unscathed.

Page 3 - Row 2

Left - Removable frame in box by Ferdinando Migani mounts two models on each side, with props racked under the wings.

Center - Models by World Champ Ryszard Czechowski.

Right - Horst Tiemann of Germany replaced 35 cm model in his box. Entire German team brought both 35 cm and 65 cm models and flew for German records during late evening hours.

Page 3 - Row 3

Left - Lineup of WCh trophies. Moving left to right: Kopecky Trophy (longest single flight), Rushbrooke Trophy (individual champion) and Langley Trophy (champion team).

Center - Bob Champine (1) discusses meet procedures with Peter Freebry (England), member of FAI Jury.

Right - Closeup of Kopecky Trophy. Model made from plated wire, imbedded in cast plastic with reflecting back plane and bottom; multiple views of model are visible from several angles.

Page 3 - Row 4

Left - Bob Champine addresses preliminary meeting to announce time of team manager meeting. These meetings were necessary because of the rained-out fifth round.

Center - Ryszard Czechowski, immediately after his 34:50 flight. (Bucky Servaites photo)

Right - Ingenious universal prop jig by Pete Andrews. Build any size prop and any pitch distribution curve, all on same jig.

Page 3 - Row 5

Left - Frank Parykaza, Ryszard Czechowski and Bud Tenny, at Aerolympics banquet, approximate time - 11:50. Three hour translated interview/bull session followed, well worth the loss of sleep! (Bucky Servaites photo)

Center - Wing mounting system used by Czechowski. It allows three wings to be stored in space normally required by two wings.

Right - Models belonging to Sylwester Kujawa, Poland.

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

New Members!

CRAIG CUBICK, 20134 Gresham St., Canoga Park CA 91306  
KEVORK K. FAGS, 236 Thayer St., River-Vale NJ 07675  
J. DOUGLAS McLEAN, 7004 S. 150th St., Seattle WA 98178

Honorary Members

S. NONAKA, 9-28, Honcho, Tanashi City, Tokyo, Japan 188  
WERNER WETZEL, 433 Mulheim/Ruhr, Gottfried Keller-str 30, West Germany

Recent Publications

Is it possible to be both Fink and Benefactor of Mankind all in the same act? Bob Meuser manages this in the Sept. '74 AAM with "Supersweep, by Ron Wittman as told to Bob Meuser". This is the Supersweep story in glorious prose, profusely illustrated with photos and detailed full sized plans. It can well become a classic for serious indoor HLG fliers. So, where does the "Fink" part come in? Part of his closing remarks are, "The next step is the most difficult. Take all the finished components, put them in a safe place, and wait for the October issue of AAM." See what I mean?

Easy B Fly Off

The June '74 INAV announced a revised winner listing in a couple of events in the '74 NIMAS Postal. Since Hal Crane had been named winner in the May '74 INAV, he was a bit disappointed when Dick Hardcastle's time was announced in the next issue. So, at 3 am on July 7, in Hangar #5, it was Easy B at 10 paces. Dick Hardcastle flew first to 12:02. Hal logged 12:26, rebound for 12:28. Not content, Hal then suggested a two-flight match. So, Dick then put up one for 13:30 for a total of 25:32 against Hal's 24:54.

NIMAS Awards

GOLD CAT. II HLG AWARD - 0:56.4, Richard Doig

SILVER CAT. II RUBBER AWARD - 20:27.0, Richard Doig

Thanks To The Navy

All those who attended the Aerolympics realize it would have been almost impossible to find another site where the whole show could have been held at one place. It was such an outstanding event and the Navy such a good host, that we should send them a letter of thanks. Commander Jack Bolton was the liaison officer in charge of all contact with AMA, and the Capt. Will Nealon, our general host at the Aerolympics banquet, is Base Commander. Letters of thanks to each should be sent to Lakehurst NAS, Lakehurst, New Jersey.

CONTEST CALENDAR

NEW JERSEY - Lakehurst

Tentative flying dates at Lakehurst #5 hangar: Sept. 1, Sept. 22, Oct. 13, 1974. Call 609-737-3522 the Friday before to be sure hangar will be available.

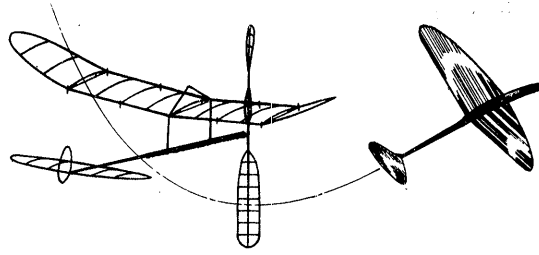
COMING SOON!

The August issue, with the Nats report, should soon (like two weeks??) be coming your way! Watch for it!

# INDOOR

## NEWS and VIEWS

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



THE 1974 INDOOR NATS

HIGH CEILING HLG

Junior

1. Jimmy Clem	83.8
2. Matthew Simpson	87.2
3. James Bayly	83.8
4. Dan Brown	59.3
5. Tommy Giertz	53.2
6. William Langley	47.5
7. Joe Diraddo	40.0
8. Mike Clem	37.8
9. Jim St. Clair	26.8
10. Donielle St. Clair	20.5

Senior

1. Michael Stoy	121.0
2. Robert Dunham II	118.1
3. Robert Hayes	108.2
4. Jeffrey Nix	108.0
5. Larry McFarland	104.9
6. Keith Gordey	100.3
7. Ken Bauer	94.2
8. William Schlarb, Jr.	83.9
9. Joseph King	80.4
10. Ran St. Clair	72.2

Open

1. Rudy Kluber	126.7
2. Mike Fedor	121.1
3. Jim Haught	110.4
4. Mike Ransom	109.4
5. Phillip Sullivan	106.3
6. Charles Markos	104.5
7. Dan Belleff	103.8
8. Richard Doig	100.7
9. Jesse Shepherd	97.0
10. William Schlarb	95.3

LOW CEILING CABIN

Junior

1. Barry Pallet	5:35.5
2. Dan Brown	5:28.6

Senior

1. Robert Dunham II	9:31.7
2. William Shailor	8:08.8
3. Keith Gordey	5:56.7

Open

1. Bob Randolph	14:04.0
2. Tony Schott	10:40.2

EASY B (Low ceiling only)

Junior

1. Jimmy Clem	5:52.8
2. Donielle St. Clair	2:28.0
3. Jim St. Clair	1:28.9

Senior

1. Walter Lounsbury	8:09.0
2. William Schlarb, Jr.	6:32.7
3. Marguerite Valerius	6:00.0
4. Ran St. Clair	2:54.0

Open

1. Richard Hardcastle	11:37.2
2. Stan Chilton	10:28.5
3. Allan Vollmer	10:08.0
4. Mark Valerius	9:23.1
5. Rolfe Gregory	9:02.4
6. William Langley	7:05.6
7. Mike Fedor	6:54.8
8. Tony Schott	6:16.0
9. Jeffrey Annis	5:47.5
10. Verna St. Clair	3:25.0

HIGH CEILING INDOOR STICK

Junior

1. Jimmy Clem	14:44.6
2. Dan Brown	11:40.5
3. Carl Linstrum	2:59.0

Senior

1. William Shailor	19:18.9
2. Robert Dunham II	16:04.0
3. William Schlarb, Jr.	9:47.5
4. Keith Gordey	7:23.7
5. Walter Lounsbury	3:32.8

Open

1. Bud Tenny	19:16.2
2. Dan Domina	19:08.6
3. Stan Chilton	19:00.0
4. Steve Brown	18:39.9
5. Howard Haupt	16:34.0
6. Ronald Roberti	16:14.8
7. Richard Doig	15:39.0
8. Charlie Sotich	14:51.1
9. Bob Randolph	14:45.0
10. Roman Szymula	13:49.4

LOW CEILING INDOOR STICK

Junior

1. Dan Brown	15:37.8
2. Jimmy Clem	12:54.0

Senior

1. Robert Dunham II	14:12.2
2. William Shailor	11:39.0
3. Keith Gordey	8:36.7
4. Kevin Wehner	5:23.8
5. Walter Lounsbury	0:24.5

Open

1. Bob Randolph	20:02.8
2. Dan Domina	20:02.3
3. Steve Brown	17:51.1
4. Richard Hardcastle	17:26.1
5. Roman Szymula	16:15.1
6. Howard Haupt	15:32.5
7. Jeffrey Annis	15:21.8
8. Bud Tenny	12:11.4
9. Charlie Sotich	10:53.5
10. Richard Doig	10:07.8

LOW CEILING PAPER STICK

Junior

1. Dan Brown	15:32.2
2. Jimmy Clem	10:47.5
3. Barry Pallet	7:53.8

Senior

1. William Shailor	11:37.6
2. Ken Bauer	11:08.0
3. Robert Dunham II	9:16.0
4. William Schlarb, Jr.	9:08.2
5. Joe Carbone	4:16.5

Open

1. Bob Randolph	14:51.2
2. Dan Belleff	14:39.2
3. Dan Domina	14:31.0
4. Charlie Sotich	13:38.9
5. Charles Markos	13:30.0
6. Richard Doig	12:47.1
7. Stan Chilton	12:24.0
8. Steve Brown	10:53.2
9. Mike Fedor	9:16.0
10. Tony Schott	7:43.0

HIGH CEILING PAPER STICK

Junior

1. Dan Brown	13:28.9
2. Jimmy Clem	11:08.2
3. Donielle St. Clair	3:49.5
4. Jim St. Clair	1:38.5
5. Mike Clem	0:54.0

Senior

1. William Shailor	14:46.6
2. Robert Dunham II	13:08.7
3. Ken Bauer	12:12.5
4. Keith Gordey	11:19.8
5. William Schlarb, Jr.	5:13.9

Open

1. Bob Randolph	18:06.0
2. Stan Chilton	17:30.4
3. Richard Doig	16:51.5
4. Charles Markos	16:45.5
5. Howard Haupt	16:06.4
6. Dan Domina	14:45.8
7. Richard Hardcastle	14:01.5
8. Charlie Sotich	13:49.8
9. Dan Belleff	13:19.8
10. Mike Fedor	12:52.2

LOW CEILING HLG

Junior

1. Tommy Giertz	81.6
2. Guy Larsen	80.1
3. Barry Pallet	76.6
4. James Bayly	76.6
5. Douglas Marsh	66.2
6. William Langley	56.4
7. Joseph Damare	26.2
8. Jack Damare	10.5

Senior

1. Robert Dunham II	92.2
2. Michael Stoy	90.4
3. Ken Bauer	80.1
4. Robert Hayes	79.3
5. Brian Pardue	77.0
6. Peter Kazanjian	71.0
7. Bruce Johannessen	69.9
8. Steven Rak	63.4
9. William Schlarb, Jr.	62.2
10. Joseph King	56.4

Open

1. Rudy Kluber	100.6
2. Dan Domina	97.1
3. Paul Shailor	95.8
4. Richard Doig	92.6
5. Charles Markos	90.6
6. Phillip Sullivan	88.6
7. Allan Vollmer	86.0
8. William Schlarb	79.6
9. James Lewis	75.4
10. Glenn Lee	75.2

HIGH CEILING CABIN

Junior

1. Dan Brown	2:21.8
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Senior

1. Keith Gordey	12:11.3
2. William Shailor	9:30.4
3. Robert Dunham II	8:50.5

Open

1. Bob Randolph	19:33.6*
2. Tony Schott	8:37.8

\*Model disallowed by FFCB

HIGH CEILING FAI STICK

Junior

1. Jimmy Clem	26:47
2. Dan Brown	26:04

Senior

1. William Shailor	45:39
2. Robert Dunham II	35:14
3. Ken Bauer	27:21
4. Keith Gordey	19:53
5. Walter Lounsbury	3:12

Open

1. Stan Chilton	47:34
2. Dan Domina	38:19
3. Charles Markos	38:01
4. Steve Brown	37:45
5. Jesse Shepherd	35:42
6. Richard Doig	34:17
7. Charlie Sotich	31:51
8. Richard Hardcastle	29:01
9. Jeffrey Annis	23:45
10. Bud Tenny	19:49

PENNYPLANE (High ceiling only)

Junior

1. Dan Brown	7:50.8
2. Carl Linstrum	2:48.4

Senior

1. Walter Lounsbury	10:49.5
2. Bill Shailor	6:55.0
3. Keith Gordey	6:42.0
4. Kevin Wehner	6:32.0
5. Steve Robbins	2:08.5
6. Ran St. Clair	0:38.0

Open

1. Steve Brown	10:10.8
2. Bud Tenny	9:16.0
3. Earl Hoffman	9:10.3
4. Mike Fedor	6:52.6
5. Gilbert Robbins	5:52.6
6. Bob Randolph	5:44.0
7. Al St. Clair	5:21.0
8. Richard Doig	4:45.0
9. Jeffrey Annis	4:12.0
10. Richard Hardcastle	4:03.0
11. Robert Hayes	3:57.2
12. Dave Linstrum	3:45.4
13. Lawrence Miller	3:16.6

LOW CEILING FAI STICK

Junior

1. Dan Brown	27:17
2. Jimmy Clem	21:37

Senior

1. Ken Bauer	28:28
2. Robert Dunham II	27:01
3. William Shailor	22:58
4. Keith Gordey	18:59
5. Walter Lounsbury	0:28

Open

1. Dan Domina	44:27
2. Bob Dunham	33:29
3. Steve Brown	32:47
4. Charlie Sotich	29:56
5. Richard Hardcastle	29:38
6. Bud Tenny	29:33
7. Howard Haupt	28:56
8. Jeffrey Annis	28:13
9. Richard Doig	26:11
10. Robert Hayes	16:37

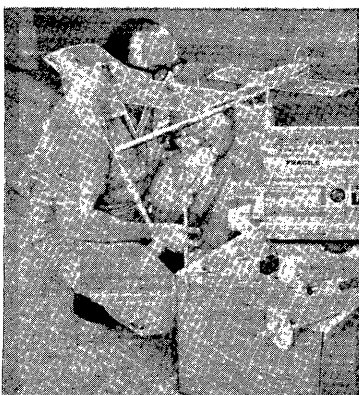
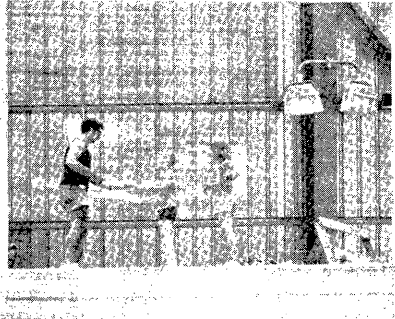
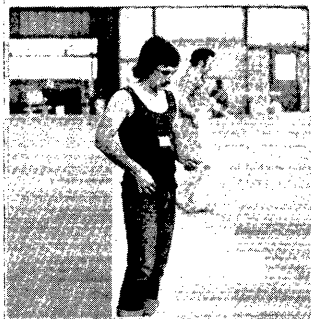
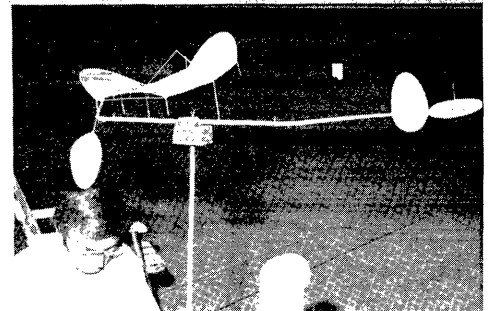
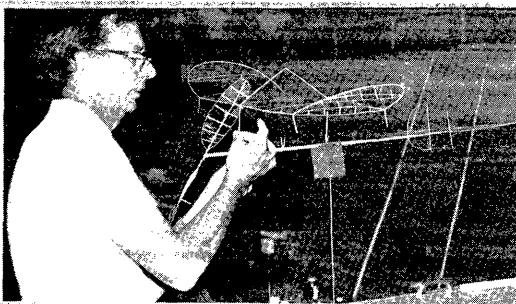
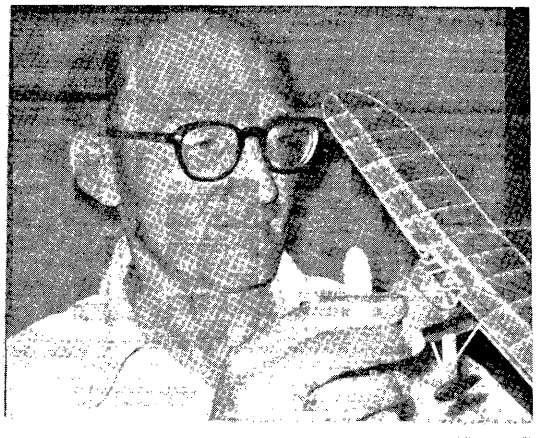
INDOOR CATEGORY CHAMPION - Chuck Markos  
 Runner-up - Dan Domina  
 STOUT CABIN TROPHY - Bob Randolph  
 STOUT STICK TROPHY - Bob Randolph

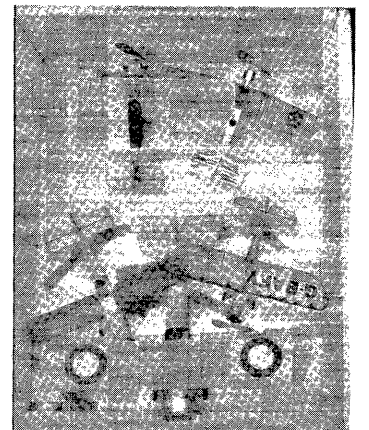
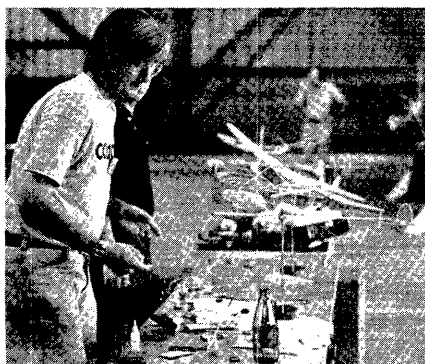
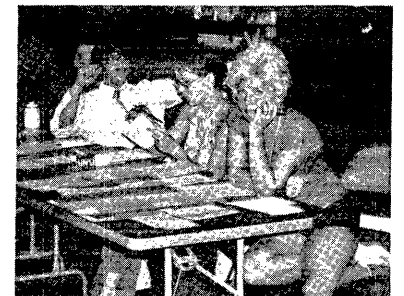
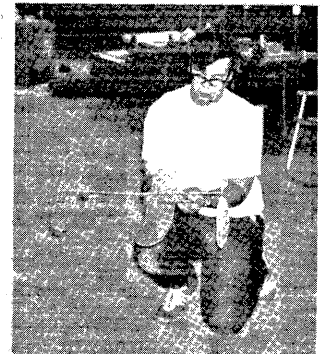
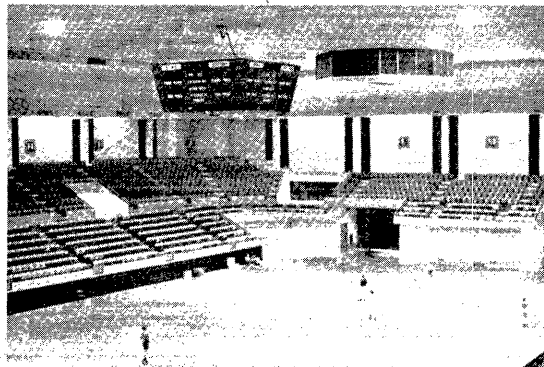
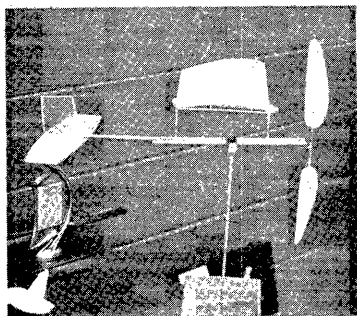
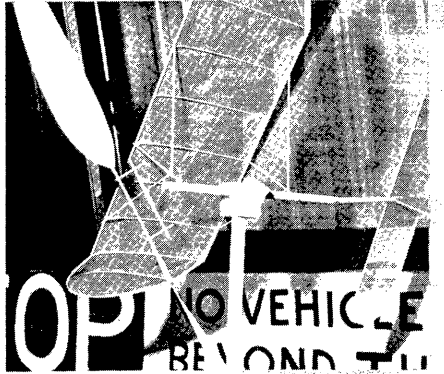
SCALE RESULTS  
 PAGE 4

THE PICTURE STORY

Photos by Tenny with processing by Kyle Babick unless otherwise noted.

Page 2 - Row 1  
 Left - Bob Randolph with biplane PennyPlane. All surfaces mite covered; good climbing model. (Linstrum)







AMA INDOOR SCALE Model		Static	Flight	Total
1. Fred Stark	Monocoupe 90AL	81.5	58.4	139.9
2. Chuck Markos	Westland Widgon	72.5	63.0	135.5
3. John Martin	Stahlwerke RII	65.0	55.4	120.4
4. Andy McIsaac	IYOH N-62 Eaglet	76.0	35.9	111.9
5. Charlie Sotich	Evans Volkplane	50.5	98.8	101.0
6. Rolfe Gregory	Stinson SR-5	57.0	31.1	88.1
7. Ted Dock	Wight Quadraplane	58.0	26.3	84.3
8. William Wargo	Westland Widgon	27.0	37.0	54.0
9. Paul Couture	Bucker Jungman	15.0	113.0	30.0

#### NAVY SCALE

1. Fred Stark	Brewster XS2B	71.0	63.1	134.4
2. Jeff Annis	Bellanca Skyrocket	68.0	48.2	116.2
3. Ralph Kuenz	Grumman Wildcat	72.0	31.9	103.9
4. John Martin	Bristol Scout	63.0	31.4	94.4
5. Rolfe Gregory	Stinson SR-5	55.0	30.0	85.0
6. Ted Dock	Wight Quadraplane	64.0	18.0	82.0

#### BIPLANE SCALE

1. George Meyer	AVRO 511	74.5	24	98.5
2. Ted Dock	Waco SRE	48.5	48.0	96.5
3. John Martin	Bristol Scout	63.0	31.0	94.0
4. Rolfe Gregory	Travelair	53.5	32.5	86.2
5. Norman Read	Fokker DVII	51.0	7.0	58.0

Center - Richard Doig with 90 cm Indoor Stick - Stoll/Crowley CS-1 design (Top Ten Model winner). (Linstrum)  
 Right - Ted Dock with Piper Vagabond. (Martin)

#### Page 2 - Row 2

Left - Bob Dunham with FAI model. (Linstrum)  
 Center - Barry Pallet, winner of Low Ceiling Cabin and runner-up Junior National Champ. ( )  
 Right - Al St. Clair winds for Donielle while Jim watches. The whole St. Clair family flew indoor models.

#### Page 2 - Row 3

Left - Mike Ransom, Pryor, Oklahoma; 4th place High Ceiling HLG.  
 Center - Dick Hardcastle with Indoor Stick model; 4th in Low Ceiling event.  
 Right - Stan Chilton with unusual "high thrust" Paper Stick model. Canted stick raises thrust line, which is at normal angle. Large angular difference between thrust line and motor stick requires rubber O-ring and wire O-ring to form U-joint. (Ganslen)

#### Page 2 - Row 4

Left - Jesse Shepherd - first Nats since 1964, when he placed in three Junior indoor events. Welcome back!  
 Center left - Whole flock of kids on ledge in Goodyear hangar helped retrieve gliders.  
 Center right - Donielle St. Clair prepares to launch HLG at hangar. (Ganslen)  
 Right - Dan Domina with 65 cm model - impressive performance in both low and high ceilings.

#### Page 2 - Row 5

Left - Bud Tenny and FAI Penny (enlarged PennyPlane design with Rodemsky bracing - 1st High Ceiling Stick on trim from Tulsa Finals. (Linstrum)  
 Center - Al St. Clair (background) watches Tony Schott wind for Paper Stick.  
 Right - Vic Larsen with Halberstat Bipe; 3rd in California Peanut Scale. (Martin)

#### Page 3 - Row 1

Left - Robert Hayes (1) and Charlie Sotich set out PennyPlane trophies, donated from Chicago Aeronuts treasury. (Ganslen)  
 Center - Larry McFarland, 5th Sr. High Ceiling HLG.  
 Right - Charlie Sotich, Chicago Aeronuts, prepares PennyPlane flight. (Linstrum)

#### Page 3 - Row 2

Left - Torque-variable prop by Jeff Annis (see Feb. '74 INAV). Similar prop on Jeff's FAI also flew very well. (Ganslen)  
 Center left - Mike Fedor, 4th in PennyPlane. (Ganslen)  
 Center right - Tommy Glertz, 1st Low Ceiling Jr. HLG in foreground. Glenn Lee, AMA Dist. VII VP placed 10th in Open, passes behind.  
 Right - Dan Brown, with his Paper Stick model which gave him four 1st places and two 2nd places, flying in FAI, Indoor Stick and Paper Stick.

#### Page 3 - Row 3

Left - PennyPlane by Robert Hayes, Chicago Aeronuts. He was event director on condition that other Aeronuts would cover for him while he flew.  
 Center - Beautiful Sports Arena in Lake Charles new Civic Center. An excellent site, in spite of the scoreboard in the center, which was lowered to retrieve models.  
 Right - Ken Bauer, with Paper Stick model which got him two trophies.

#### Page 3 - Row 4

Left - Guy Larsen, 2nd in Jr. Low Ceiling HLG.  
 Center - Fred Stark, with his Brewster XS2B, Navy Scale winner for the third time. (Martin)

INDOOR PEANUT #2 Model		Static	Flight	Total
1. Charlie Sotich	Evans Volkplane	56.0	108.0	156.0
2. John Martin	Martin MO-1	65.0	64.8	129.8
3. Ted Dock	Piper Vagabond	52.0	64.8	116.8
4. Walt Mooney*	DH Sparrowhawk	73.0	34.0	107.0
5. Ted Dock	Waco E Bipe	63.0	40.2	103.2
6. Andy McIsaac	PT-19	79.0	22.2	101.2
7. Mike Ransom	Pietenpol	60.0	34.1	94.1
8. Rolfe Gregory	Travelaire 2000	62.0	32.0	94.0
9. Jerry Murphy	Pietenpol	58.0	10.5	68.5
10. Guy Larsen**	Druine Turbulent	42.0	17.5	59.5
11. Norman Read	Piper Vagabond	19.0	17.2	36.2
12. Norman Read**	Piper Vagabond	12.0	17.0	29.0

\*Proxy flown \*\*Highest placing Juniors

#### INDOOR PEANUT #1

		Flight time	Flight place	Looks place	Total
1. Dan Domina	J-3 Cub	132.0	1	5	6
2. John Martin	Martin MO-1	65.5	5	3	8
3. Vic Larsen	Halberstadt Bipe	11.0	11	1	12
4. Bill Caldwell	Culver Cadet	13.0	10	2	12
5. John Martin	Luton Minor	92.0	2	10	12
6. Lois Dock	J-3 Cub	29.0	9	6	13
7. Guy Larsen	J-3 Cub	31.0	7	6	13
8. Ted Dock	Piper Vagabond	70.0	4	9	13
9. Rolfe Gregory	Bellanca Bipe	33.0	6	8	14
10. Fred Stark	Daimler L-15	80.0	3	11	14
11. Gar Larsen	Pietenpol	31.0	8	7	15

Right - (1. to r.) Sandy Frank, Asst. CD, Janie Parris, who did almost all the contest paperwork, and Sandy Martin, who timed many flights.

#### Page 3 - Row 5

Left - Bill Shailor with his Indoor Stick model, high time Indoor Stick at the hangar. The Stout Stick trophy went to Randolph, winner of Low Ceiling Stick.  
 Center - Chuck Markos, Indoor Category Champion, with his Westland Widgon. His score in Scale gave him the few points margin needed to pull ahead of Dan Domina for the championship. (Linstrum)  
 Right - Dr. John Martin's five scale models. (Martin)

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

#### New Members!

BILLY B. DUNLOP, 11249 Russwood Cir., Dallas TX 75229  
 ANDREW FAYKUN, 9410 Dayton Way, Beverly Hills CA 90210  
 ROBERT O. HAYS, 519 Berriedale Dr., Cary IL 60013  
 MIKE KEVILLE, 6618 Dashwood St., Lakewood CA 90713  
 ROBERT LARSH, 415 S. Whitcomb Ave., Indianapolis IN 46241  
 CHARLES MARKOS, 1106 Montgomery Dr., Deerfield IL 60015  
 JOE NORCROSS, 4836 W. 123rd St., Hawthorne CA 90250  
 TED SACHS, Jr., 1325 W. Jefferson, Lake Charles LA 70601  
 BILL SCHLARB, 4116 York Rd., South Bend IN 46614  
 HOWARD J. STEWART, 35 Laura Lane, Plainview NY 11803  
 ROMAN SZYMULA, 2731 NW 135 St., Miami FL 33054

#### Family Memberships

ROBERT W. HAYS, 519 Berriedale Dr., Cary IL 60013  
 BILL SCHLARB, Jr., 4116 York Rd., South Bend IN 46614

#### Honorary Members

BUTCH HADLAND, 19 Greenway Close, Nythe, Swindon, Wiltshire, England

#### CONTEST CALENDAR

CANADA - British Columbia  
 Fall Indoor Meet, Oct. 27, 1974, Agrodome, Port Coquitlam, B.C. 10 am to 4 pm; Indoor Scale, FAI Stick, PennyPlane, HLG. Alan Riches, 1568 Celeste Cres., Port Coquitlam, B.C., Canada V3C 1E2.

CONNECTICUT - Glastonbury  
 Club meetings/flying sessions of the Glastonbury Modelers, Oct. 8, Nov. 5, 7 pm to 9:30 pm; Oct. 27, 8 am to 12:30 pm. George Armstead, 89 Harvest Lane, Glastonbury, CT 06033, 203-633-7836.

#### NEW JERSEY - Lakehurst

Tentative indoor sessions at Hangar #5, Sept. 22, Oct. 13, 1974. Call 609-737-3522 the Friday before to be sure hangar is still available.

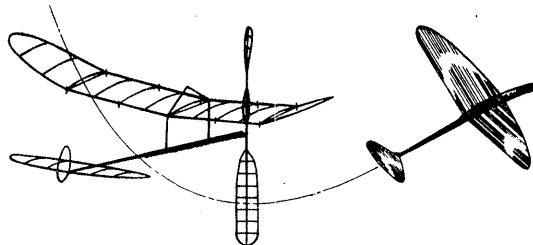
#### THIS ISSUE

This issue has been abbreviated by one page; it was a profound shock to get the printing bill for the July '74 WCH issue after an 18% increase in printing cost! An immediate resolve to eliminate page 5 of this issue led to a rather jammed format, plus deferring all of Dr. John Martin's Scale commentary and various comments regarding the rest of the Nats. So now I'm a fink/benefactor too!

# INDOOR

## NEWS and VIEWS

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



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

### New Members!

ART WHITE, 12507 Honeywood Trail, Houston TX 77077

### Honorary Members

DIETER SIEBENMANN, Aemtlerstr 4, 8003 Zurich, Switzerland  
KOEI TSUDA, 1-19-9 Higashi-Motomachi, Kokubunji City,  
Tokyo, Japan

### NIMAS Decals

At long last, after many moons, and all that stuff, there are NIMAS Decals available. They are 30¢ each or four for \$1. Send a stamped, return addressed envelope with your order, please.

Mr. and Mrs. Bob Leishman, P O Box 902, Levittown PA 19054, made the new NIMAS Decals. They also made special decals for the 1974 Indoor World Championship and donated all proceeds in excess of expenses to the Inboard Travel Fund. They do excellent work, at a reasonable price, and on a good delivery schedule. If your club needs decals, you can only lose by not checking with them.

### Sympo Report

The National Free Flight Society has published the 7th annual Sympo - Report of The Seventh Annual Symposium, held at Chenault Field, Lake Charles Louisiana. This Sympo was dedicated to Frank Zaic, and the cover bears a reproduction of an oil painting of Frank. The painting was given to Frank a couple of weeks before the Mats, at a banquet in his honor. Part of the dedication has this to say, "This Free Flight Symposium is dedicated to Frank Zaic. Truly a living legend, our teacher of Free Flight. No other person has contributed so much to our knowledge, our comradeship, our spirit of Free Flight. We make this dedication to our friend, our leader, for his appreciation."

This report has about the same balance of technical, semi-technical and whimsical articles as in past years. This one is lacking in indoor coverage, except for plans of the CS-1 90 cm indoor model, designed by Ed Stoll and Paul Crowley, and chosen as one of the Top Ten Models. The reports are available from NFFS, P O Box 322, Dallas OR 97338; the price is \$5 each to U.S. members of NFFS and AMA or \$6 to non-members in the U.S. Postage rate (surface mail) in the U.S. is 50¢ for any number of copies.

### Renewal Reminder

Since this is the September issue (never mind when it came out!), those with 09 as a part of their address block received a renewal notice with this issue. If you have a 10, 11 or 12, your subscription expires in October, November or December respectively. As usual, and particularly during the Fall and Winter months, advance renewal saves a lot of time here on Newsletter Night. About 25% of the membership is now paying before renewal is due, and it is deeply appreciated. (Membership currently \$3.25/year.)

### Thanks For Mats Sites

Even though it is late, it isn't too late to send a note of thanks to the people who furnished sites for the Indoor Mats.

Mr. Hoyt Tolleson	Lake Charles Chamber of
Goodyear Blimp Hangar	Commerce
Box 626	Lake Charles, Louisiana
Spring, Texas	

### New Products

Ray Harlan's specialty shop now has the following items: Indoor Scale, \$30; Micrometer Balsa Stripper, \$18, Pigtail Thrust Bearings, 75¢ each. The quoted prices are for the items; postage extra. Send a stamped, self-addressed envelope to Ray Harlan, 15 Happy Hollow Rd., Wayland MA 01778 for catalog sheet and postage info.

### FAI INDOOR REPORT

#### FAI Indoor Committee Meets

On Sept. 14-15, 1974, the recently elected FAI Indoor Committee met in Detroit and transacted an amazingly large amount of business in what seemed to be a short weekend. The delegates spent almost 200 man-hours making a detailed examination of their assigned tasks and creating thoroughly developed solutions. Similar results could have taken months to achieve by mail. In short, the meeting style developed and perfected by AMA's Executive Council - face-to-face, in-depth discussions - produces results almost unmatched by any other possible interchange.

Briefly, the committee established its own operating protocol and guidelines, and made far-reaching plans for future team selection programs. Then they detailed a program for selecting the 1976 Indoor Team, with the selection to begin early in 1975. By now, most U.S. readers of INAV should have received an opinion poll which discusses the program provisions. The poll will be followed shortly by a ballot for eligible participants to approve or disapprove the new program. Ballots will automatically be sent to participants in the most recent Indoor team program, and to all others who register for the upcoming program. Program registration is made by making advance payment of the entry fee in the first contest of the program.

It is interesting to note that, in spite of numerous local entertainment possibilities, most of the delegates never left the hotel complex where the meeting was held. There was one exception - the Detroit Balsa Bugs held a pool party and weiner roast for the delegates. The Friday evening bash was hosted by Don Roberts, a well-known scale modeler. It was a very enjoyable interlude, and a welcome contrast to the coming hours of detail work. Many thanks to Joan Rodemsky, who typed all the various reports in time for copies to return to AMA HQ in finished form, hand carried by Frank Ehling.

#### Program Comments

Feedback from many people who received the opinion poll mentioned above shows that the proposed point system is only partially understood. First, some background. A study of past WCh meets showed that in almost every case, teams could be ranked by consistency or time with the same results. In addition, although there is pressure to win a team berth, even the U.S. Finals are low-key compared to a WCh. Earlier in the programs, team selection has always been more a ritual than competition. Finally, most all meets have about two "good" rounds that tend to dominate the scoring and help pick fair weather fliers.

So, briefly, rank a guy on how well he does in every round, but let him drop the two lowest. Make him do well (80% of the winning score) at three widely spaced meets. Set up conditions favoring cross-zone competition which makes him work harder and learn from others outside his own area.

Cross-zone competition, besides furnishing new ideas, is also expected to prevent sandbagging (tame competition which allows as many as possible to qualify). At any meet where there has been sandbagging, no one really does his best, and may even fall into sloppy flying habits that will hurt his performance under pressure.

The business of carrying points through two zone meets into the Finals gives a good measure of consistency. It requires a flier to do well in Zone meets in order to help his score in the Finals - keeps him on his peak.

Scoring each round requires a flier to do well each round - after all, each round may, due to weather change, be the best one that day, and you won't know until too late! If you blow more than two rounds, you've had it for that meet! After all, we now have the standard as set by Czechowski - five excellent flights and one good one in a WCh, regardless of the conditions. Can we expect less if we are to win a World Championship?

The actual round scoring mechanism is simple - just like Mats championship scoring, but figured on each round and add the four best. You don't have to win any rounds, but you better be close for a better points score.

### MORE WCh NOTES

Since the WCh issue came out, some more things have come to mind and should be reported. In the rush to meet various deadlines, prepare for the Nats and catch up at work, these items at least were overlooked.

Besides the midair destruction derby occasioned by the massive hangar leak, an almost-simultaneous hard draft on the north edge of the flight area caught Boyd Felstead's model and some American models on stands; many were badly damaged. However, Pete Andrews was prepared - at the first sound of thunder, long before the storm hit - he packed away his models.

Not enough stress was placed on the performance of the Polish Team, and that of Ryszard Czechowski, the new World Champion. Those who read the results sheet closely have noted that the Poles were remarkably consistent. In fact, their consistency score - 84% - exceeded that of any previous World Champion, and Czechowski scored 96%. Consistency is computed by dividing the six-flight total by 3, to get the average two-flight total. This figure is then divided by the best two-flight total. To put a 96% consistency score in perspective, Czechowski could have won with any two flights of his best five! It has also been reported that none of Czechowski's flights touched the top of the hangar. From the times, it is apparent that they didn't miss very far, either! This performance of the Poles is a triumph of advance preparation at the work bench, since they had only four chances to fly in 1974. All of these sessions were at major European contests, where practice flying is sparse.

The matter of volunteer timing was incredibly important to a successful WCh, and perhaps 30% of this work was handled by the ladies. Cathy Learoyd, Betty Barr, Betty Farham (wives of English Team members), Sandy Martin and Mrs. Bob Leishman are some of the most faithful timers. Gloria Alto worked long and hard assigning timers, filing and recording flight cards, and typing results after each day's flying was done.

A very interesting model flew exceptionally well at the International meet, but won no prizes. This was Doug McLean's biplane PennyPlane Tandem. The model flew for 16:03 on its longest flight, and Doug thinks a better prop will yield even more time in the hangar.

### NATS COMMENTARY

The 1974 Indoor Nats was a busy scene - as the results layout in the Aug. '74 issue showed. Instead of five events counting Scale, it was five events (FAI Stick added to the usual Stick, Cabin, HLG and Paper Stick) in each of two sites, plus Easy B and Scale in Low Ceiling. Add PennyPlane and the four extra Scale events sponsored by outside groups, and there was a whole bunch of flying!

The two sites were the Goodyear Hangar in Spring, Texas, and the Sports Arena of the new and beautiful Civic Center in Lake Charles, La. Both sites appeared to be ideal, and each site had moments of good conditions. For the first time ever, there were no "home town boys" who knew the peculiarities of the sites. Also, as sometimes happens, the conditions did not improve late in the day. As a consequence, those who were ready when the air was good got the good times, but those who waited couldn't quite catch up.

A rainstorm on Sunday afternoon helped mess up the air for HLG, and vastly hindered Rudy Klumber's efforts to catch up with Fedor, Haight and Ransom. Their times had been posted earlier, and they expected their times to be beaten handily. The rain also encouraged early use of the hangar lights, which generated hot spots on the floor. The resulting air circulation patterns had to be experienced to be believed!

About 8 pm, during PennyPlane, the odd conditions became more pronounced. PennyPlane models would struggle vainly to climb, drift toward the wall and lose altitude. Just before contacting the side, the models would drift out and catch upward moving air. Thus, spectators were treated to the sight of PennyPlane models slowly rising, long after the power burst was gone. If you refer to the results, it is possible to note a large gap between the top times and the other times. If a model had lots of torque and turns as it came away from the wall, it would easily ride the rising air; if not, it would dribble off to the side.

During the indoor rubber events on Monday, those who waited for the hangar to settle, or get better, or whatever, were out of luck. There probably is a key to good times in such a beautiful site; it may be that Spring and Fall sessions there would be more stable. This was suggested on the basis that the mid-summer sun at the lower

latitude (compared to Lakehurst, for example) simply requires more rapid heat transfer than the relatively small volume of air can handle. Late in the day, a definite inversion layer formed, which is not common in all-metal hangars.

On Tuesday at the Civic Center, the air was really good about 2:30, with times in the 55' flat ceiling rivalling those in the hangar. Then it rained. By 4 pm, a definite cooling trend was apparent, and those who hadn't "done it" by then, didn't. On Wednesday the HLG times were quite good for the ceiling, in contrast to the fairly low hangar times.

If any event place or Indoor trophy is in dispute after the meet, it usually is the Stout Cabin trophy. Although Bob Randolph's high ceiling Cabin model, which featured a removable pod/landing gear section, was not allowed (an appeal to the Contest Board is in progress), Bob's low ceiling flight (using the retractable gear model which he flew in the past) also won that event. However, the Stout Trophy for Indoor Stick is "up in the air", with Stan Chilton (FAI Stick winner) and Bob Randolph (Indoor Stick winner) claiming the trophy.

Speaking of FAI, the addition of this event to the Nats insured the presence of a lot of FAI models. Very few Indoor Stick flights were made with models other than one gram FAI models.

The great abundance of indoor events didn't seem to dilute the overall participation as might have been expected, since nearly everyone entered almost everything it was possible to enter with the models they had. All the Junior events were low in participation, but if only two of the families that entered and didn't make it had flown, the participation would have doubled to almost normal. Indoor Cabin was more of an attendance disaster than ever. It is apparent that this event is still around only because there is a Nats perpetual trophy available. These super-critical, super-fragile models seem to dilute the effort of anyone who builds them except the died-in-the-wool purists. The only others who build Cabin are those in search of extra points toward Nats Championship. If the event is worth saving, it seems that only a drastic rules change would do it. Certainly, most people find no reason to build a model that can usually make only five official flights a year!

### INDOOR SCALE AT THE NATS

by John and Sandy Martin

It was Christmas, Fourth of July and Circus Day all in one for the indoor scale fan at the '74 Nats. No less five events were scheduled - one official and four unofficial. Besides the usual AMA Indoor Scale event were added the Miami Indoor Club's Navy Scale event, the California Flightmasters' Peanut Scale event, the Chicago Aeronuts' Peanut Scale event and the Biplane Scale event. All the clubs contributed their own very distinctive trophies and there was no entry fee charged. As a side note, there were at least a dozen AMA scale entries flying at the Lake Charles Civic Center that were not part of the 20 official entries. I discovered that the cost to enter late, plus the regular AMA fee amounted to \$25. This is big money for a club member to pay his own club for an event, even in these inflated times. I don't know the solution, but I feel this matter needs some attention. This story will probably be the only acknowledgement of these clubs' efforts that will appear in print.

AMA Indoor Scale results; Ralph Kuenz judge: Here is the official biggie - a reduced field of 20 craft - 14 in AMA and 6 in Navy Scale. This total was enhanced by the dozen fringe flyers who flew for their own amusement for the large crowd of spectators. The crowd was very appreciative and applauded not only good flights, but some mediocre ones as well. (Results tabulated page 1.)

The winning planes: (1) Fred Stark - 3/4" to the foot, 24" span. It was the best looking of the entries and was copied after a real craft owned by a friend. It was a heavy 33 grams in weight and powered with 4 strands of .075 pirelli in a 36" loop. Fred has great success with small, fast-running low pitch props on long loops of rubber - three times the nose-to-rear-hook distance. The prop was 6" diameter with 35° angle at the tip of the plywood blades. His best flight of 58.4 seconds was achieved on 1920 turns. This highly detailed model appeared in the July '74 MAN.

(2) Chuck Markos had considerable success with the Wigdon and made a new version this year. He used condenser paper instead of the usual jap tissue, and hand carved a 7" dia., 5 1/2" pitch prop. Although he had previously done 1:22, and 1:08 would have won, the best he could manage was 1:03 and he broke many motors.

(3) Dr. John Martin - When the biplane he intended to enter proved disappointing, he built a little (15") Stahlwerke RII from Walt Mooney plans. It was finished in one week and came to the Nats untrimmed. It was more detailed than Walt's version, weighed 1/3 oz., and was powered by a 22" loop of brown rubber. The cut-down Midwest plastic prop gave 55.4 seconds on 1850 turns, but it would only fly with 5° of upthrust.

(4) Andy McIsaac - His Itch, at 1 oz., was the heaviest of the winners. The 24" loop of 1/4" pirelli gave flights near 50 seconds on 1500 turns. He carved his own 7 3/4" prop and used clear-doped jap tissue for covering.

(5) Charlie Sotich's little Volksplane also won the Scalemasters Peanut Scale event.

MIAMA's Navy Scale Event was judged by Andy McIsaac. Fred Stark, who won almost everything else, won the Navy Scale event for the third time in four years with the same airplane! His Brewster XS2B had a 6 1/2" prop with 35° pitch turned by a 30" loop of 1/8" pirelli. It had 19 1/2" span and was light at 20 grams. Although it was a fat and unlikely looking flyer, it did 1:03 on 1850 turns after having trouble taking off all evening.

FLIGHTMASTERS Biplane Scale was judged by Ralph Kuenz and Russ Barerra. Believe it or not, this was the most closely contested of all the indoor scale events. Even though there were only seven entrants, all were in the running and only 4 seconds separated 1st and 3rd. George Meyer, of "Little Toot" fame, flew a beautiful jap tissue covered yellow and black Avro 511 biplane to win.

Peanut Scale has stirred much interest in both indoor and outdoor free flight circles. There were two indoor Peanut events - one using the Flightmasters' Walt Mooney rules and one using the Chicago Scalemasters rules. Both clubs donated fine trophies for their event. The Mooney rules are as follows:

1. Any number of flights - best one counts.
2. Any number of entries per contestant - only the best one counts.
3. Hand launch or ROG - no bonus for ROG.
4. After flying, line up the models, ranking them from best to worst for static/scale position points.
5. Combine flight score placing with static position for final results - low score wins.
6. Tie breaker - best static (scale) score wins.

#### Chicago Scalemaster rules:

1. Maximum 100 points static score; workmanship - 40, accuracy - 30, finish, color and markings - 30.
2. Maximum 100 points flight score at 1 point per second; flight score can exceed static score.
3. All flights ROG - best flight of four counts.

Judge Ralph Kuenz was using these rules himself for the first time and said he had trouble applying the 40 points for workmanship.

Both sets of Indoor Peanut rules are a vast improvement over the current ones intended for outdoor flying. The Chicago rules require longer to apply and need more documentation and scrutiny. Their ROG requirement is a plus. Perhaps the flying score should be limited to equal to static score but then this becomes too much like AMA Indoor Scale. Perhaps these rules already are too much like Indoor Scale for a fun event. By contrast, the Mooney rules are quick and easy to fly and maximize both the number of planes and the flying they do. Since you fly "against the field" of entrants and are not judged to some 100 point perfect plane, the man with the best chance builds to the local philosophy. In a field of five good flying planes and two good looking ones, the "flyers" have the best chance. The opposite is true in a field dominated by super scale modelers. These rules can't be used in a postal contest unless the model is sent for proxy flying.

Just for kicks - score the Chicago contest with the Mooney rules - look at the surprising results: the 1st place plane would be 5th, 2nd place moves to 1st and the 3rd place model ends up 7th!

The reason I'm going into all this is that we'll soon be asked to OK a new set of Peanut rules, and there is considerable world-wide interest in them. Keep your eyes peeled for the MIAMA rules which combine some of the features of both sets of rules plus some emphasis on reducing documentation requirements. Also MIAMA gives some bonus static points to the heavy or hard-to-trim ships such as autogyros and helicopters, float planes and flying boats, and craft with two or three operating props (we get some nutty looking entries here in Miami!)

The winners: (1) Charles Sotich - The only deviations from scale were enlarged dihedral, stab, and landing gear. He's been winning all the Chicago contests with this ship for the last four years. Scratch built, it was ultralight (under 3 grams) and covered with microlite. The 4 1/2" prop has 7 1/2" pitch in the bent 1/32" sheet blades. 1500 turns on a 15" loop of .042 pirelli gave its best flight of 1:48.8. (1) Dan Domina got away before I could interview him, but his J-3 Cub looked like a stock Micro-X kit built very light and capable of flights over two minutes.

John Martin - 2nd in both contests - flew his MO-1 that was 3rd in the '62 Nats. 4 1/2" bent sheet prop with 45° angle at the tips. A 20" loop of .060 pirelli with 1800 turns produced a 1:05.5 flight. The model was covered with yellow jap tissue and silver microlite, weighed four grams and had many details such as radiators, exhaust stacks, pilot and observer, Lewis gun and sight, etc.

Ted Dock - His Piper Vagabond, a stock Ken Johnson designed Micro-X kit, was 3rd in the Chicago contest, 7th under the Mooney rules and 2nd outdoors on a windless morning!

Col. Randolph did not enter this year although he won last year. He told me he had built a new Peanut (just over one gram) capable of over five minute flights, but it didn't have a chance under either set of rules. I must say that this year the field did look like little airplanes and not Stout Trophy miniatures.

#### DESIGN FOOTNOTES

The model on page 4 is unusual, to say the least! It is the latest in a similar series by Bill Hannan, who is well known for more than his scale model activity!

#### SQUARE DEAL

by Bill Hannan

Watching the ever-increasing wing chords in PennyPlane design inspired me to pull out all the stops, and go to an all-wing configuration in order to obtain the maximum possible area within the limits of the rules.

In a sense, SQUARE DEAL is also sort of a flying social commentary on the intent of the rules. My personal opinion is that while some build model aircraft as a hobby, others look for rule loopholes as their hobby! If viewed with a sense of humor, this sort of "gamesmanship" may be OK, but traditionally those who invent and enforce the rules seldom see the fun involved.

SQUARE DEAL is the latest in a series of very low aspect ratio models developed by the author, after having studied the engineering reports by Lockheed regarding their politically stillborn SST design. Of particular interest to me as a modeler, were the figures relating to the phenomenal low speed, high angle of attack characteristics of the planform. These were carefully documented, based on both wind tunnel tests plus actual experience gained from the Lockheed YF-12A and SR-71, which feature certain similarities in planform.

In somewhat over-simplified terms, the findings indicate a sort of "pumping" action that takes place between the lower and upper wing surfaces, permitting operation at angles which would produce catastrophic stall in a conventional wing planform.

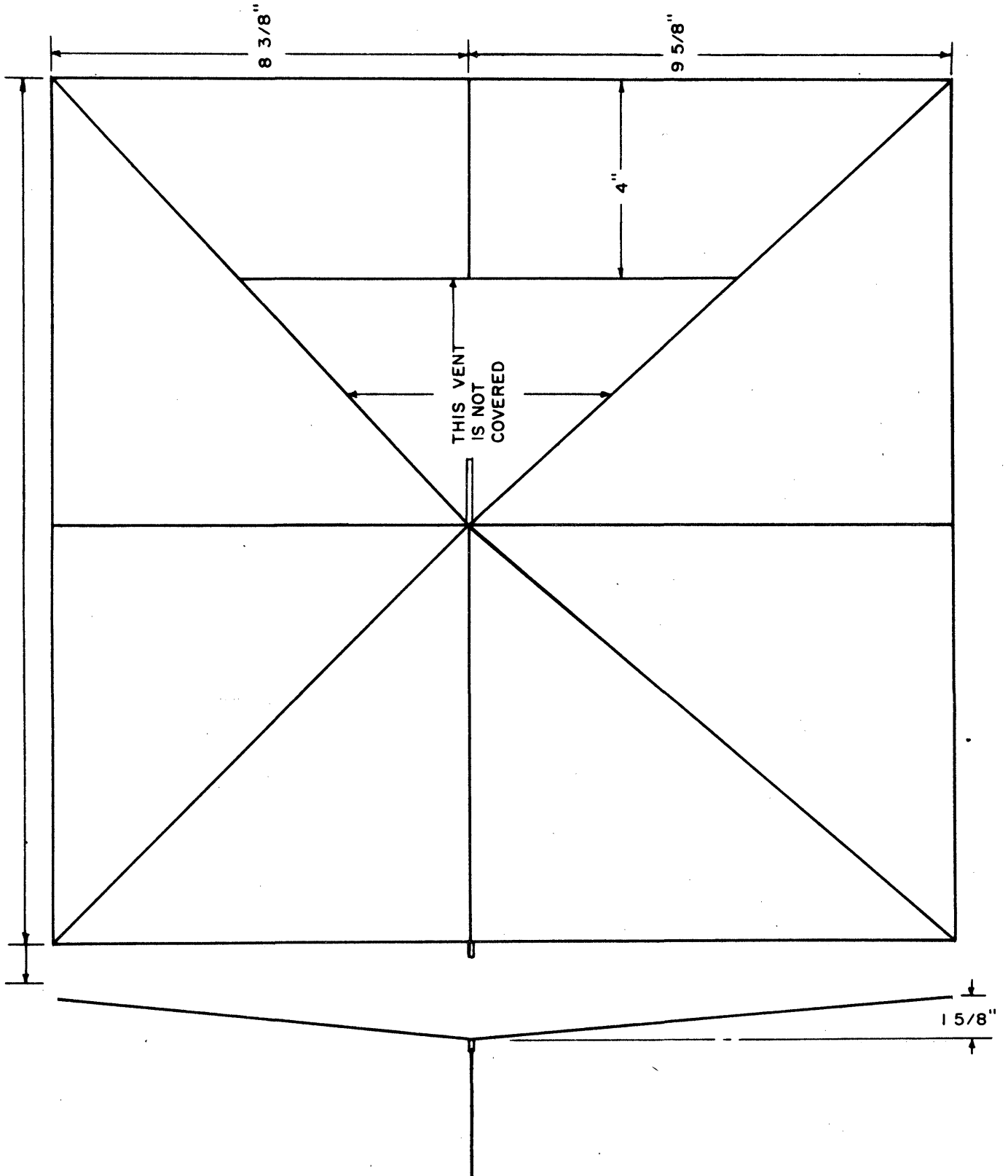
Similar phenomena can be exhibited by Rogallo configurations, and in fact, the author constructed a PennyPlane of that type, but with disappointing results.

My first success with a very low aspect ratio wing was with FUSHER GALORE, an outdoor rubber-powered model, based directly on the Lockheed SST planform. Later experiments led to vents, which permitted still greater angle of attack attitudes without stall. STRINGLESS WONDER and STAINED GLASS WINDOW were published examples of this type, which resembled common kites.

SQUARE DEAL is merely a spin-off from these earlier outdoor experiments, and has not been developed to any great degree. The prototype required nose ballast, and was fitted with a very primitive propeller, left over from TWO CENTS WORTH, a PennyPlane proxy flown by Bill Bigge at the 1970 Nats. It does prove the feasibility of the basic planform, which can take advantage of virtually all the area possible under present PennyPlane rules.

As one who is primarily a scale modeler with altogether too many projects already, the author has not pursued the development of SQUARE DEAL any further. So, it is presented here as food for thought.

18" OVERALL (EVIDENTLY SOME CLUB RULES  
EXCLUDE PROPELLER)  
PROTOTYPE DESIGN ASSUMED "WORST CASE"



BALANCE POINT APPROX. 30%

SLIGHT REFLEX AT REAR

3° DOWN

MOTOR STICK 10" x 3/16" x 1/8"

ALL WING AND FIN STRUCTURE IS 1/16" SQUARE

**SQUARE DEAL**

BY BILL HANNAN

# INDOOR

## NEWS and VIEWS

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

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

### New Members!

RONALD ROBERTI, 2502 W. Brooks, Apt. 3, Norman OK 73069  
 GEORGE HILLIARD, 2 Bedford Circle, Longview TX 75601  
 BILL HARTILL, 7513 Sausalito Ave., Canoga Park CA 91307  
 JIM VLIET, 12 Cooper Blvd., Red Bank NJ 07701

### AMA Election

All of us who are AMA members recently received a ballot from AMA Hq., giving us an opportunity to elect a new president or re-elect John Clemens; all VP's in the even-numbered AMA Districts are also being selected. The '74 presidential race certainly offers a choice; John Clemens has made the AMA presidency a highly visible and active post by stressing communication and by communicating - he got people to working to solve problems instead of just griping. The overall result is a stronger, more active organization which is standing on its own feet. His opposition, C/L Stunt expert Al Rabe, has openly down-played many of the innovations and activities of John Clemens and really offers little in concrete suggestions to fill the void.

From a historical standpoint, less than 20% of all AMA members eligible to vote actually return a ballot. Remember that the bill for 1975 dues was sent with the ballot to save postage - renewal is not a condition for voting! So, please inform yourself and vote!

### Fink/Benefactor Speaks!

Dear Bud

Thanks for the compliment about the Supersweep article, and if I forget, remind me to poke you in the snoot the next time we meet. Fink, indeed!

The Supersweep article is undoubtedly the longest 100% Free Flight article anyone has had the unmitigated gall to submit to a 90% RC magazine in modern times. When AAM made (perhaps justifiable) noises about editing it down to conform to the available space I suggested splitting it. Pat Potega replied that he had done just that. The last paragraph was written by Potega. Considering the problem, I think the split was nicely done.

Keep up the great work on INAV. You will be interested to know that whenever I go to a contest, I wear Tenny-shoes in your honor.

Good Air!

*Bal*

Robertfink Meuserbenefactor

### Where Are They Now?

Stephen Vosa, who joined NIMAS in March, '74, was an active member of the Trenton Model Airplane Engineers in the late 1930's. He has asked for information about any of these modeling pioneers. Send him a note at 59 Ethel Dr., Portsmouth RI 02871 if you have any info.

### CONTEST CALENDAR

#### CALIFORNIA - Santa Ana

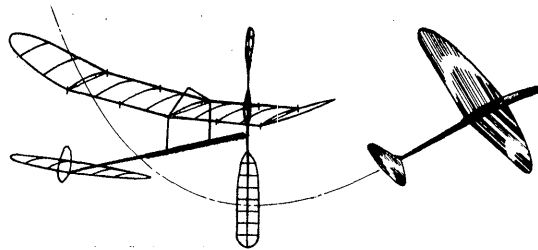
Record Trials at Santa Ana, Nov. 23-24, 1974. Call Bob Randolph at 714-796-9706 on the Thursday before to check on hangar availability.

#### CONNECTICUT - Glastonbury

Indoor sessions on Sundays, 8 am -12:30 pm, Dec. 8, 1974 and Jan. 12, 1975 at Glastonbury High Gym. Tuesday sessions, 7 pm 9:30 pm, in Dec. '74 and Jan. and Feb. '75 on dates available from George Armstead, 89 Harvest Lane, Glastonbury CT 06033, 203-633-7836.

#### FLORIDA - Miami

Indoor sessions 9 am-2 pm at Miami Dade North College, Sundays, Dec. 1, 1974 and Jan. 5, Feb. 2, Mar. 2, Apr. 6, 1975. Contests at Goodyear Hangar, Opa Locka Airport, 10 am - 6 pm, Nov. 24, Dec. 15, 1974 and Jan. 19, Feb. 16, Mar. 16, Apr. 20, and May 25, 1975. Contest events: Peanut Scale, Indoor Scale, Easy B, Indoor Stick, PennyPlane, Paper Stick, HLG. For confirmation of hangar dates, call



858-6363 to be sure a last minute cancellation didn't happen. Dr. John Martin, 3327 Darwin St., Miami FL 33133.

#### NEW YORK - Locust Valley

Indoor Record Trials Jan. 4, Mar. 29, 1975, 11 am - 5 pm; Boy's Gym at Friends Academy, Locust Valley, L.I., New York. Cat. I site with 33' peak and floor area about 60' x 72'. J. G. Pallet, 30 Emerson Rd., Brookville, Glen Head, NY 11545.

### FAI INDOOR REPORT

#### Program Ballot Due

About the time you receive this issue, those of you who are eligible will receive a ballot with which you can register your approval or disapproval of the proposed program to select the 1976 Indoor WCh Team.

If you participated in the 1973-74 program, or if you did not participate but registered for the new program, you should receive the ballot. Please return the ballot to AMA HQ by Nov. 15, 1974.

#### Program Highlights

Basically, the upcoming program stresses top level, consistent performance by requiring entrants to get a minimum of 80% of the top score at each of two Zone contests in order to qualify for entry into the Finals.

A point system awards points for ranking in each round of the contest, then summarizes points for each flier's best three rounds. This computation is made for each contestant's performance in each Zone meet and the Finals. The Finals score is multiplied by 3 and added to the two-meet Zone total to give a grand total. Thus, each Zone performance counts 20% of the grand total and the Finals score counts 60%. The Team will be those fliers with the top three grand totals.

The contestants with the top three Zone contest totals will each receive full airline fare to the Finals. The contestants ranked 4th, 5th and 6th will receive half fares, and 7th, 8th and 9th places will receive quarter fares. Although this is contingent upon sufficient funds being raised by entry fees, it is expected that funds will be sufficient. Otherwise, travel funds will be scaled to the available resources.

Zone contests in the usual four Zones (East, West, North and South Central) will be coordinated to permit and encourage cross-zone entry; fliers who enter more than two Zone contests will be scored on the best two totals. The Finals will rotate from Santa Ana in 1975, to the East in 1977, to the Central Zone in 1979.

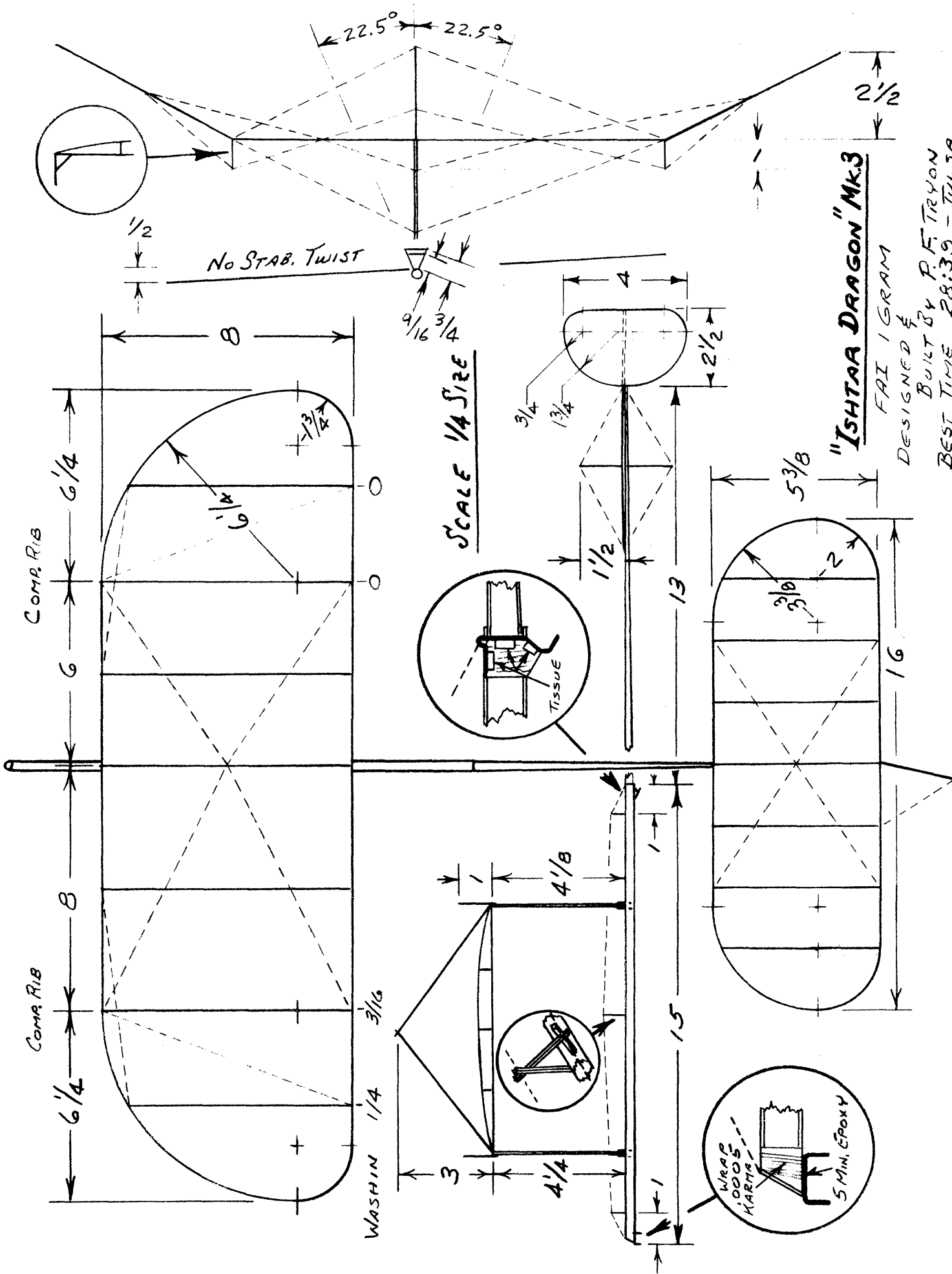
The final program submitted for approval contains a few changes from the one presented on the opinion poll of last month; mostly, the changes were in response to comments generated by local discussions and poll responses. Note there are now four Zones instead of three, scoring is on three flights instead of four, and grand total computation was changed to somewhat reduce the effect of points carried over to the Finals.

In spite of the changes, the program remains one which will require the fliers to get the best out of their models in each round of each meet, regardless of conditions. One flier opined that this method of scoring would make us all into ultra-conservative fliers, incapable of pushing a model when it was necessary. Jim Richmond, when he still had time for intensive practice and rubber testing, appeared to the casual observer to be a very conservative flier. That is, he didn't rafter-bang a lot and often logged a strong lead without ever coming really close to the top. If this program will push us all into this kind of preparation and development, we can't lose at the next World Championship!

### STATE OF THE ART

Paul Tryon's ISHTAR DRAGON placed 6th at the Tulsa Team Finals, with one flight (28:39) only 7% less than the meet high time, on a no-tough flight. While this isn't a particular distinction, the model clearly has much potential yet undeveloped. Paul's comments on the model are:

(cont. p.3)



I have been using the aft camber airfoil for several years. I know of no theories or test data that would dictate such an airfoil, and I arrived at it through a series of observations.

1. Bilgri's articles of a few years ago in MAN showed several photos where the film could be seen to be away from the ribs in the aft portion of the wing, developing a natural aft camber.
2. Around 1949 I bent the TE down about 20° to improve the glide on my HLG's. It seemed to improve the glide but it killed the launch.
3. The TE "kicker" or fence seen on some models in recent years is nothing but a form of aft camber.
4. What little test data I've seen indicate that at low Reynolds Numbers the center of pressure moves aft - perhaps to 50% or 75%.

From the above, I decided that the high point should be aft of 50% and just started sketching until I got an airfoil I liked. Tail camber is almost 0 - I fail to see what good camber does in the tail, and I think it does add drag. The prop pitches shown (note sketch on p. 4, and that the tip is progressively washed out - Ed.) are the average of both blades on the prop used at Tulsa. It also might be worth noting that I form the wing and stab tips on reduced-radius jigs in an attempt to avoid spring back; it still has been necessary to use the internal diagonal brace wire in the tips. Wood sizes below & p. 4, CMOS below; model flown at about 0%.

Wing			
LE & TE	.030 x .030	5-5.5#	B grain
Tips	.030 x .030	5.5#	A grain
Ribs	.023 x .030	4-4.5#	C grain
Comp. ribs	.027 x .027	5-5.5#	B grain
Wing posts	.0625 x .0625	.0625 x .030	Outdoor
Cabane	.030 x .030	5-5.5#	B grain
Secondary			
Bracing posts	.023 x .023	5-6#	B grain
Bracing	Primary & tip diagonals - .0007 Karma Secondary - dacron		

Stab			
LE & LE	.025 x .023	.024 x .023	5-6#
Tips	.024 x .023	4.5#	A grain
Ribs	.023 x .017	4-4.5#	C grain
Comp. ribs	.023 x .023	5-6#	B grain
Bracing	Dacron		

Fin			
Outline	.023 x .023	4.5#	A grain
Bracing	Dacron		

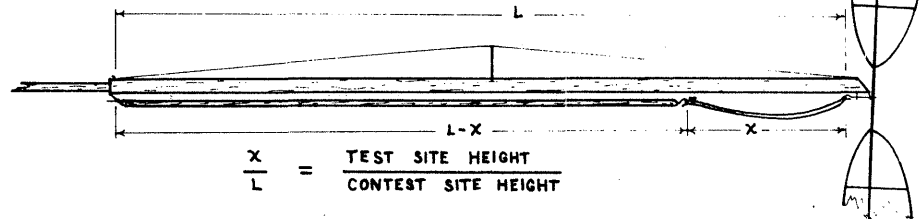
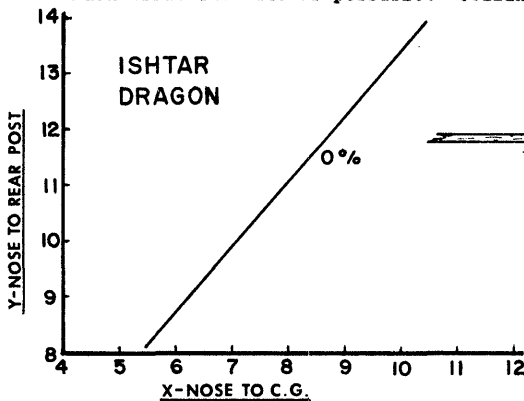
Motor Stick Assembly			
Stick	.0135 x .83	4#	C grain
Webs & cap	.0135	4#	C grain
Bracing posts			
Center	.029 x .029	5.5#	B grain
Fore & aft	.025 x .025	5-6#	BC grain
Tops	.020 x .020	5-6#	B grain
Bracing	.001 tungsten (2 wires)		
Tail hook	.015 wire		
Thrust bearing	commercial		
Tail boom	.009 x .75	.0065 x .20	4#
Bracing post	.030 x .030	.025 x .025	5-6#

#### HIGH CEILING TRIM IN LOW CEILINGS

By Clarence Mather

My test flying site is a city rec center gym with 22' ceiling, seemingly inadequate for preparing to fly in a World Championship held in sites over 100' high. Test flying in a small site with full length motor requires using much less than maximum turns, so not much can be learned. Instead, the short-motor weighted-stick method of testing has served me well at two WCh's.

The first step in preparing for a WCh is to find out as much about the site as possible. Ceiling height, type



$$\frac{X}{L} = \frac{\text{TEST SITE HEIGHT}}{\text{CONTEST SITE HEIGHT}}$$

STICK MADE FROM 1/8" SPRUCE SAND IF HEAVY  
DOPE IF LIGHT UNTIL IT WEIGHS  $\frac{L-X}{L} \times$  FULL MOTOR WEIGHT

and shape (narrow and pointed or wide and flat) of ceiling and air conditions are the most important factors, and this information usually is available to U.S. teams. For the 1968 WCh at Rome, we knew that the Sports Palace was 115' high with rather large area at the top. In October, moderate temperatures were expected and Bud Romak's previous experience there led us to expect lots of drift.

The 22' ceiling available to me was only one-fifth the ceiling in the Sports Palace, so motors one-fifth as long as those needed for 115' ceilings were made from the same size rubber as would be used in the high ceiling. A stick with hooks at each end (see sketch) were made to fill four-fifths the distance from prop hook to rear hook. The model can then be flown with the short motor and the stick and the model weighs the same as it will in competition. Now, prop speed, sink rate and other parameters can be reliably measured in the small site. The power burst can have full torque so the model can be trimmed for competition. However, the burst only lasts one-fifth as long as with the full motor, and this can give false assurances. If a model is trimmed almost to a stall when using the short motor, it may actually stall with the long motor; this happened with full turns on my last flight at Rome. On the short motor, the burst may die off before the model has time to rotate to a full stall, but with the longer burst from a long motor, the model has time to reach a stall angle.

A model with the weighted stick and short motor has one-fifth the climb and one-fifth the maximum duration of the same model with full motor. Thus it can be wound to the maximum turns possible for the short motor and flown in the smaller site. But, how many turns is that? As always, it depends upon the rubber used. Turns/inch charts are available and are useful as a rough guide, but rubber still varies in turns capability. The only sure way is to test short loops (to avoid wasting rubber). A 4" loop is suitable. Wind it lightly the first time, then repeatedly increase the turns each time. Wind slowly, feeling the rubber frequently so that a sense of breaking hardness is acquired. Continue until the loop breaks, and note the number of turns per inch required to break it. The "feel" of hardness is more important than the turns - different temperature and humidity will change the breaking turns!

When flying, I hook the rubber to the stick and put the "eye" end of the stick on the stooage. After the rubber is wound, the rubber is hooked to the prop in the normal fashion. Then the stick is hooked to the rear hook. No difficulties are caused by the stick except that it feels different at first - as is usual with new items.

If the air in the test site is the same as in the competition site, flight duration will be in about the same ratio as the ceiling heights - one to five in the example used. In Rome the first two nights had warm air and duration was about as predicted from low ceiling tests. The air was cooler the last two nights, so larger motors were required. Obviously, the closer conditions agree, the closer predictions will agree. It is very important to be precise when making the stick length and weight, along with the motor length. Properly done, this method is much better than testing with full motors, partially wound.

Sketches of the Romanian salt mine ('70 WCh) showed it was about 180' high, temperature 50° and no drift expected. So, test motors were 2 1/2" long from both normal and oversize rubber, and tests were made at 5 am when the gym was about 60°. The extra tests were expected to allow for not having salt mine conditions, but the actual conditions were much different than expected. The air seemed to be cold all the way up, and the cold air slowed the models' descent so most of them deadsticked quite high. We really needed props that turned very fast for about six minutes, then would slow way down for cruise. Many extra people and large lamps generated a lot of heat that made turbulent air, so even models properly adjusted went astray.

So, the best preparation is to fly as much as possible in many different sites - contest conditions often are much different than you are used to having!



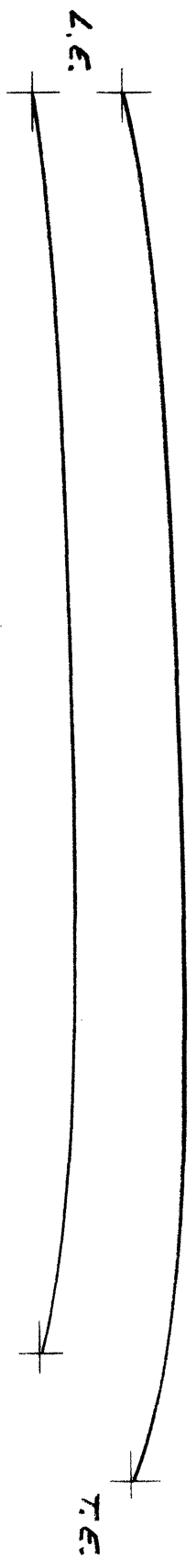
<u>Model Weights</u>	
Wing	.0107
Stick-tail asy	.0175
Prop	.0076
Total	.0356
Rubber	.0450
Flying wt.	.0806

Rubber  
 17" Loop .040 x .057  
 (measured new)  
Turns  
 On 28: 39 flight:  
 1720 t; .35 # oz torque  
 Max. altitude - approx. 88'

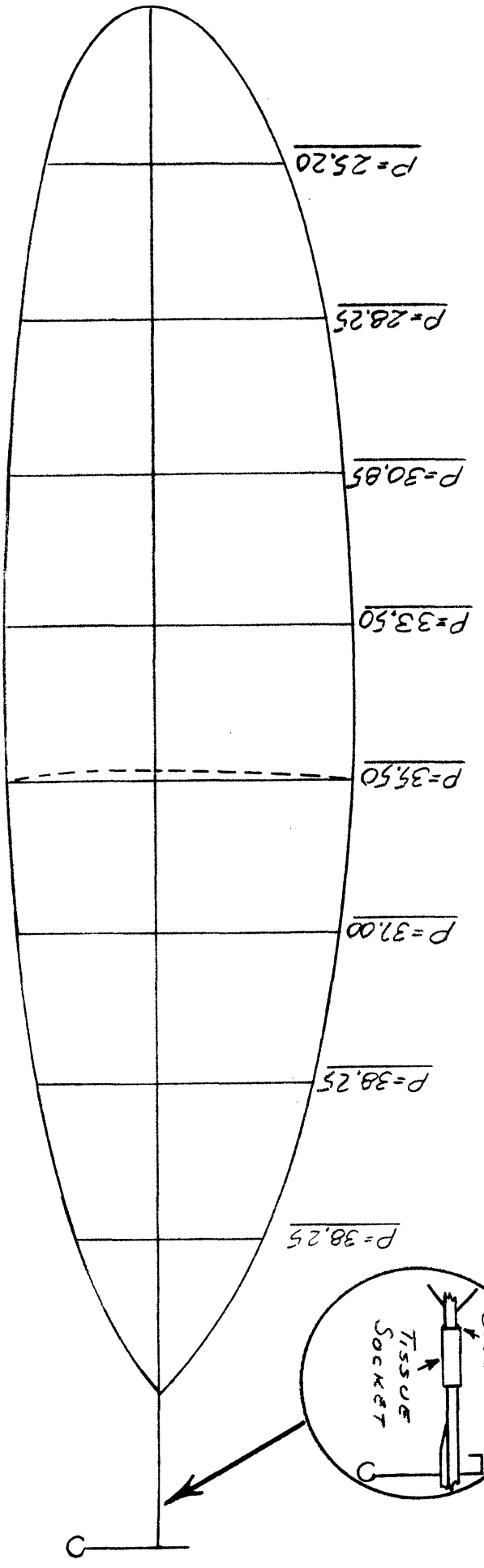
<u>Prop</u>	
Spar	.058 x .058-- .030 x .030 5#
Outline	.023 x .023 4.5#
Ribs	.020 x .022 4-4.5#
Shaft	.015 wire

Full Size

WING AIRFOILS



STRAB AIRFOIL (1.4%)



# INDOOR

## NEWS and VIEWS

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

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

### New Members!

KEN BAUER, 627 E. Monroe, Orange CA 92667  
 JOHN J. COFFEY, 638 Elizabeth St., Salt Lake City UT 84102  
 JAMES McDANIEL, 452 Catherine St., Elizabeth NJ 07201  
 JIM WHELAN, 9110 SW 77 Ave., Apt. B-12, Miami FL 33156  
 PETER WHITE, 27630 Northwind, Euclid OH 44132  
 THOMAS L. WOODS, 3726 S. Hereford Lane, Philadelphia PA 19114

### Honorary Members

SVEN PONTAN, Idunvagen 33, S-136 42 Handen, Sweden  
 R. S. WHYBRAY, 31 Dunstal Field, Cottenham, Cambridge CB4 4UH England

### Special International Issue

As usual, the November issue is dedicated to all indoor fliers outside of the North American continent - friends from all over the world. I am pleased to salute all these fliers. Their activity serves as counterpoint to our own, besides often being a spur to improvement in our own state of the art.

### NFFS Call For Papers

Hewitt Phillips, well-known NASA aero engineer and long-time NIMAS and NFFS member, is the 1975 editor of the NFFS Sympo. He issues this call for papers:

The National Free Flight Society is soliciting papers for the 1975 Symposium to be held at the 1975 Nats. Papers will be published in the 1975 Symposium whether or not the author is able to present his paper personally at the Nats. Papers should cover some aspect of the science and art of free-flight models, including technical studies, practical design and engineering as applied to models, or historical items. Both Indoor and Outdoor free flight modeling developments are to be included. Please send proposed papers to:

W. Hewitt Phillips  
 310 Manteo Ave.  
 Hampton VA 23661

Send title of proposed paper together with an abstract of 200 words or more, or a complete paper if it is available. To be considered, abstracts should be submitted by March 15, 1975.

Editorial comment: Just as INAV absolutely depends upon your contributions, the NFFS Sympo must have input from indoor fliers in order to use indoor material. The most recent Sympo journals have had little indoor coverage; there are many indoor fliers who conduct suitable investigations for their own benefit. Why not report them?

### MERRY CHRISTMAS!

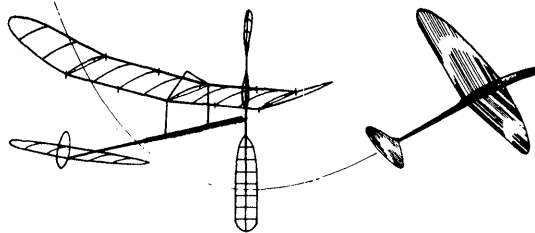
With the time of year being what it is, the Nov. '74 INAV should reach you just before Christmas. Thank you all very much for the greetings we are already receiving, and we wish you all the best now and in the year to come.

### Thanks For Corresponding!

With so many of you waiting for me to return a letter, it is gratifying to note that most of you have continued to send news, ideas and information. It simply has not been possible for me to correspond, except sporadically, and without your support it would be impossible to build a newsletter. I have not given up hope of answering most of the backlog, but part of the problem is related to the necessity of supplementing income via free-lance writing. Keep writing, and I'll do my best!

### SCATTER Lives Again!

For a number of years, the Southern California Aero Team published a top-notch newsletter especially for FAI FF fliers; predictably, the newsletter was called SCATTER. It is now being revived; for a short time the subscription rate is \$3/year anywhere in the world. After a bit of operation, costs will be evaluated and new rates set. If it is like the original, it would be a bargain at \$5!



### NIMAS Awards

Silver Cat. I Rubber Award - 13:29.9, Richard Whitten

Gold Cat. I Rubber Award - 13:44.6, Richard Whitten

### Financial Report

This issue begins the 14th year of publication of INAV and, except for editorial tardiness, all seems to be well. Income covered outgo, growth slumped in mid-year and then picked up again, and reader support continues. Net growth is 1.4%, and in spite of both a postal rate increase and an increase in printing charges, some money was left over. The breakdown is as follows:

Printing costs (INAV only)	\$456.29
INAV Postage	452.13
Correspondence postage	77.52
Office supply, misc.	255.65
	<u>1241.59</u>

With income amounting to \$1255.64, this leaves \$24.05 to carry forward to 1975. 1974 expenses were projected to be \$1116, expecting an immediate postal increase. The postal rate increase was delayed, but there was a healthy increase in printing costs. With 1974 as an example, it seems prudent to increase membership rates 25%/year, to \$3.50/year. For subscribers outside the North American continent, first class delivery is \$3.50 and air mail is \$4.50/year.

On the services side, incoming letters totalled 497, and outgoing mail amounted to 508 pieces. Average circulation moved from 345 to 350 copies per month, with an average of six new members per month since the July issue. A large number in queries are awaiting answer now, so perhaps the growth will continue.

### FAI INDOOR REPORT

#### Team Selection Program

Although these numbers are unofficial, they indicate the high degree of acceptance granted the new program: 71 ballots sent; 64 responses with 58 "yes" votes and only 6 "no" votes. This seems to indicate a strong success for the FAI Committee concept. As a reminder, the program (see Oct. '74 issue for program highlights) was conceived and modified, discussed and dissected and refined by a face-to-face meeting of the Committee members. A subsequent opinion poll gave opportunity for participant opinion feedback which further refined the program to the form which was so overwhelmingly approved.

#### C.I.A.M. Meeting

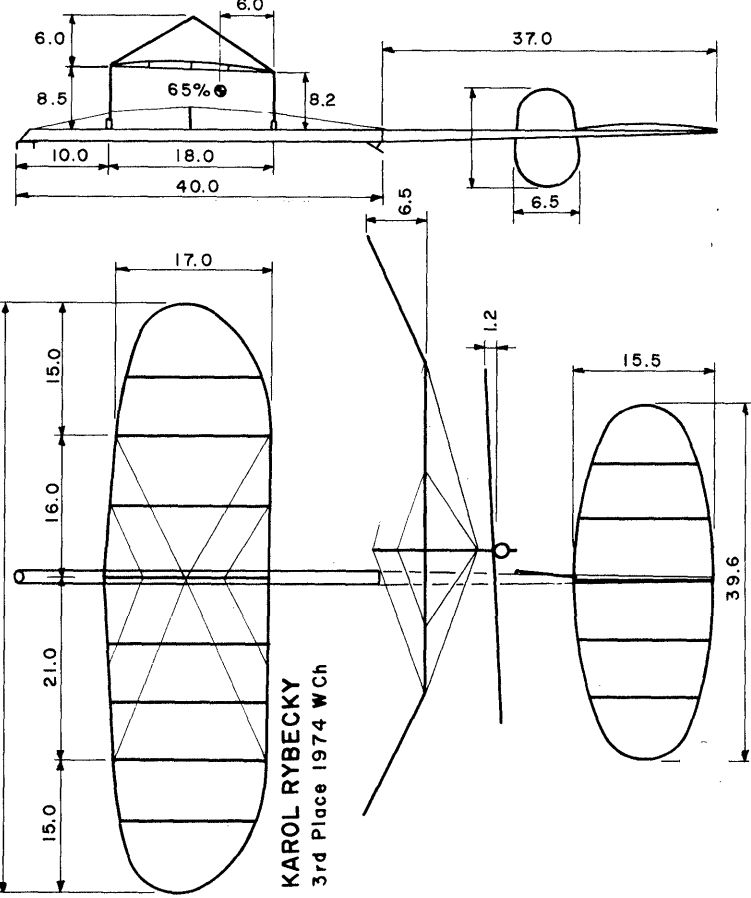
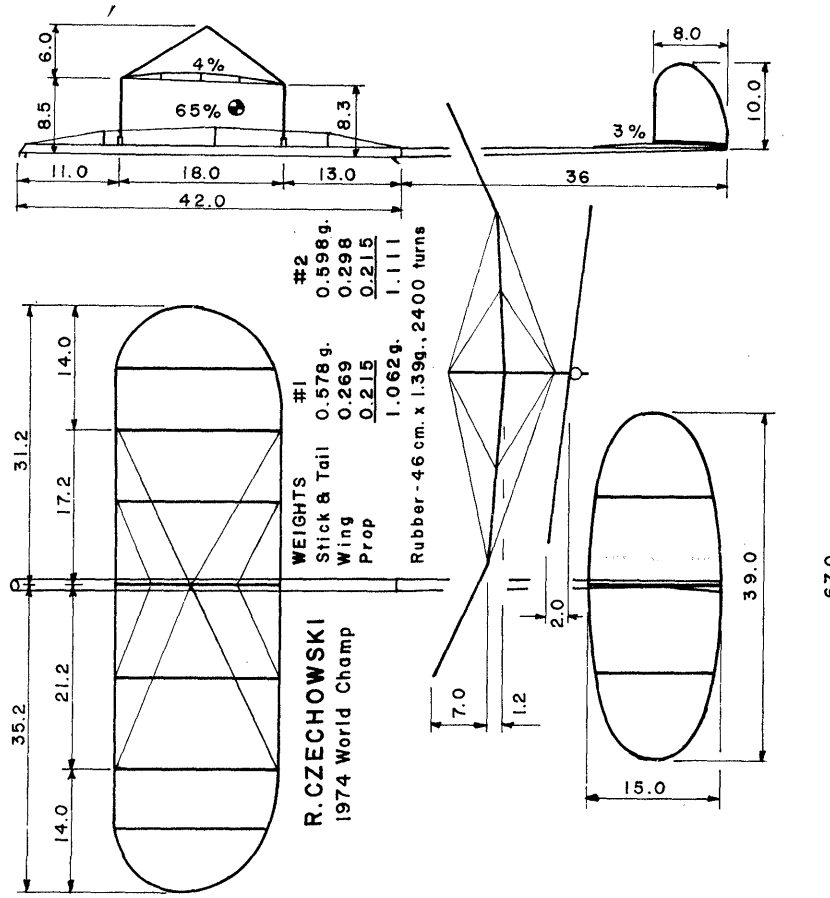
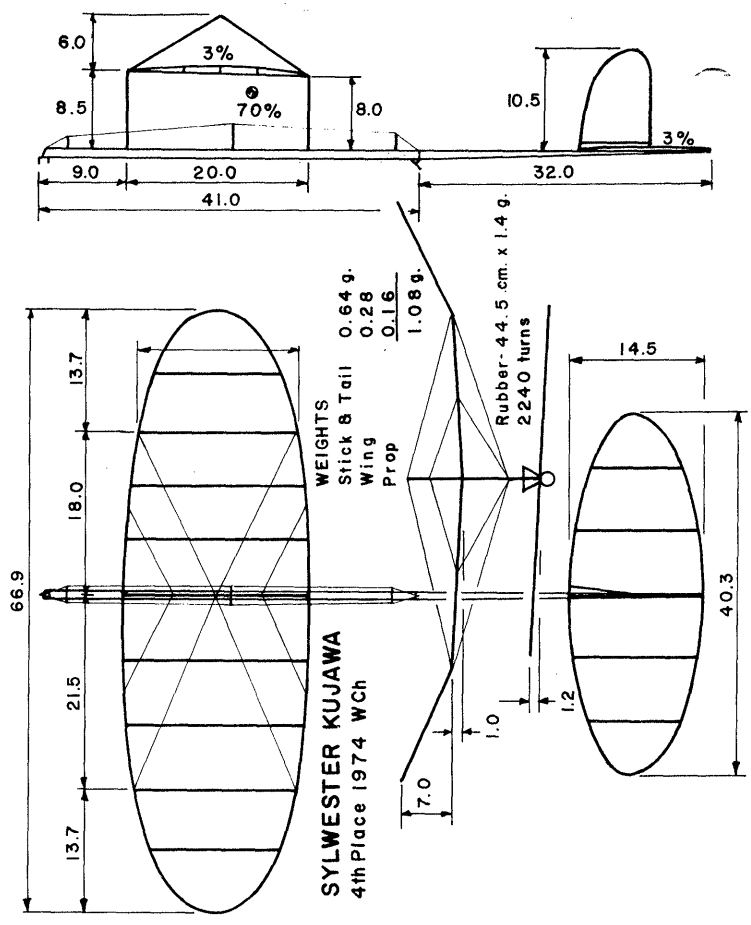
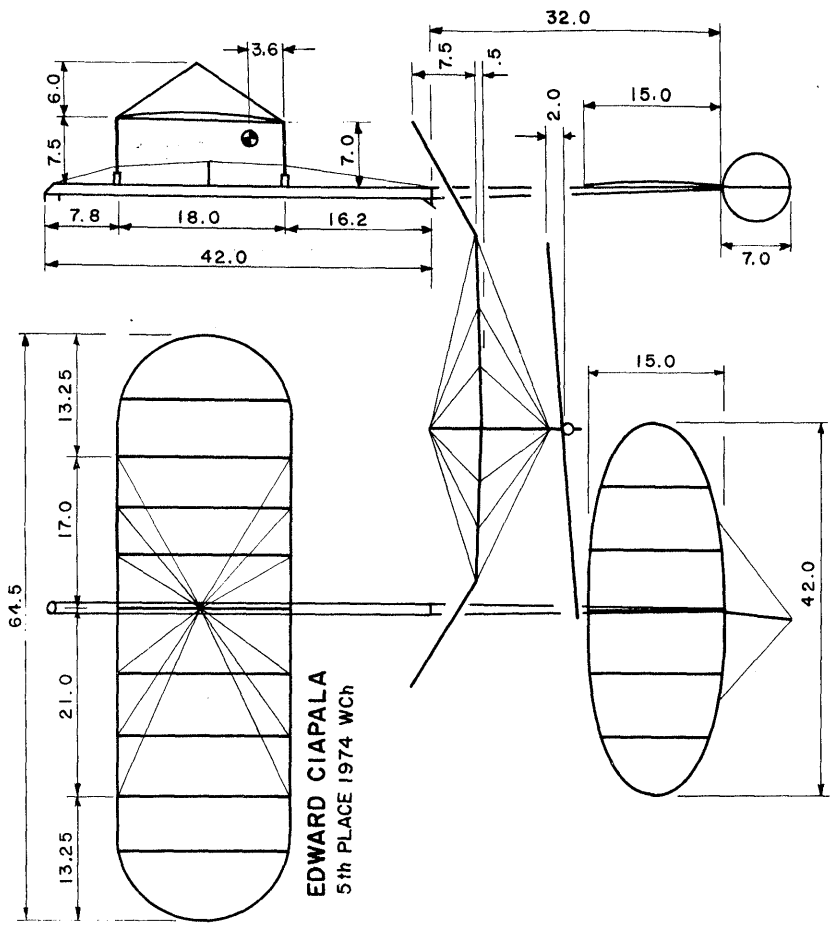
Although the exact wording will be available sometime in 1975, two changes in FAI indoor flight rules can be summarized roughly thus: For any flight which terminates within 30 seconds, another attempt may be made. If a model touches the floor after launch and does not come to rest (continues the flight), the timing will continue.

A Hungarian proposal for a smaller model with many restrictions, to be substituted for the existing 65 cm, one gram model was defeated; instead, the proposed model specification was instituted as a provisional class to be used to help promote indoor flying.

Finally, the Kopecky Trophy (awarded for the longest single flight in a WCh) has been approved by the C.I.A.M. to continue as an official perpetual award. This trophy was sponsored and donated by the East Coast Indoor Modelers, the club which was fortunate to have Ernie Kopecky as a member until his death in July, 1973.

### CONTEST CALENDAR

CONNECTICUT - Glastonbury  
 Indoor sessions at Glastonbury High Gym: Tuesdays, 7 pm-9:30 pm, Jan. 14, Feb. 18, Mar. 18, Apr. 3, May 6, June 3, 1975; Sundays, 8 am-12:30 pm, Jan. 12, Mar. 9, May 11, 1975. Indoor contests Feb. 9, Apr. 13, 1975. For details, contact George Armstead, 89 Harvest Lane, Glastonbury CT 06033, ph. 203-633-7836.



**FLORIDA - Miami**

Indoor Fly-ins at JFK Gym, Miami Dade North College, 9 am-2 pm (confirm by calling 858-6363), Jan. 5, Feb. 2, Mar. 2, Apr. 6, May 4, 1975. Indoor contests at Goodyear Blimp Hangar, Opa Locka Airport, 10 am-6 pm, Jan. 19, Feb. 16, Mar. 16, Apr. 20, May 25, 1975. Confirm hangar dates. Dr. John Martin, 3227 Darwin St., Miami FL 33133.

**ILLINOIS - Chicago**

Indoor contest at the Drill Hall, Glenview Naval Air Station, Glenview, Ill., Dec. 29, 1974; Delta Dart and 90 Minute HLG. For those who haven't heard, you get 90 minutes to build the glider - not have to fly it 90 minutes! Indoor contest at Madison Street Armory in Chicago, Jan. 26, 1975; HLG, PennyPlane, Peanut Scale and Paper Stick. Pete Sotich, 3851 W. 62nd Pl., Chicago IL 60629.

**OREGON - Albany**

Indoor contest at South Albany High School Gym, 3705 S. Columbus St., Albany; PennyPlane, Easy B, HLG, Kit Peanut Scale, AMA Indoor Scale, Earl Moorhead Event, and Ready-To-Fly (models furnished at door), Jan. 12, 1975. Contest same site on Feb. 23, 1975; AMA Scale, Unmodified Kit Peanut, Open Peanut, Popularity Scale, Keyhole Scale, and Scale Old Timer. Both contests 10:30 am-3:30 pm, site open 9:30 am. Contact CD Bob Stallok, 1120 Shady Lane, Albany OR 97321, ph. 928-8101 for more details and special rules.

**NEW JERSEY - Union**

Indoor sessions at Livingston School on Midland Blvd., Union, N.J., on the 2nd Thursday of each month thru May, 1975. Contact Dan Domina, 47-01 Fox Run Dr., Plainsboro NJ 08536 for time and details.

**NEW YORK - Locust Valley**

Indoor Record Trials Jan 4, Mar. 29, 1975, 11 am-5 pm, Boy's Gym at Friends Academy, Locust Valley, L.I., New York. Cat. I site with 33' peak and floor area about 60' x 72'. J. G. Pallet, 30 Emerson Rd., Brookville, Glen Head, NY 11545.

**TOP TEN EASY B**

Name	Time	Ceiling	Fudge	Score
1. Bob Platt	657.0	19.6'	1.336	877.8
2. Hal Crane	608.0	19.6'	1.336	812.3
3. Dick Hardcastle	634.0	22.0'	1.261	779.5
4. Clarence Mather	531.0	22.3'	1.253	715.5
5. Kevin Wehner	431.4	20.5'	1.307	563.8
6. Fudo Takagi	445.0	22.3'	1.253	557.6
7. Alan Riches	422.2	20.2'	1.314	554.8
8. Bill Langley	418.0	20.5'	1.307	546.3
9. Michael Thompson	347.0	20.0'	1.323	459.1
10. Ted Katsanis	338.0	20.0'	1.323	447.2

**INDOOR ELSEWHERE**

International Indoor Contest at Slanic - Prahova, Romania, May 9-12, 1974.

1. Aurel Popa	Romania I	37:50	38:25	76:15
2. Eugen Holtier	Romania I	35:21	34:53	70:14
3. Sylwester Kujawa	Poland	33:13	34:45	67:58
4. Jiri Kalina	Czech.	33:43	33:40	67:23
5. Edward Ciapala	Poland	32:54	33:56	66:50
6. Karol Rybecky	Czech.	32:42	33:55	66:37
7. Andras Ree	Hungary	32:04	31:25	63:29
8. Eduard Chlubny	Czech.	32:20	31:00	63:20
9. Ryszard Czechowski	Poland	31:48	31:26	63:14
10. Aurel Moraru	Romania I	29:57	31:05	61:02
11. Antal Egri	Hungary	29:24	29:49	59:13
12. Ghorgho Sora	Romania II	27:17	28:25	55:42
13. Daniel Fratesanu	CSU Galati	27:47	26:30	54:17
14. Piotr Bombol	Poland	26:04	25:29	51:33
15. Zoltan Ocsody	Hungary	25:36	25:13	50:49
16. Gyorgy Buzady	Hungary	22:57	26:33	49:50
17. Vasile Niccoara	CSU Galati	22:35	27:07	49:52
18. Gh. Chinga	CSU Galati	22:50	25:37	48:27
19. Tudorel Lungu	Romania II	25:32	21:47	47:19
20. Eugen Curea	Romania II	19:51	20:25	40:16
21. Pees Nikola	Bulgaria	16:11	16:01	32:12
22. Slakov Georgi	Bulgaria	15:03	12:36	27:39

**Team Results**

Romania I	207:31
Poland	198:02
Czechoslovakia	197:20
Hungary	172:32
CSU Galati	152:26
Romania II	143:17
Bulgaria	59:51

The Canadian Team Selection meet was held May 5, 1974, at a 30' site in Ontario. The results:

1. Andy DeMello	20:33	18:28	39:01
2. Jack McGillivray	20:08	17:03	37:11
3. Mike Thomas	13:08	13:30	26:38
4. Paul Roberts	11:59	14:36	26:35

British Indoor Nats, Aug. 17-18, 1974, held at Cardington Hangar.

**EASY B - Best 2 flights of 6 (16 entries)**

1. Laurie Barr	15:18	14:20	29:38
2. John Blount	14:05	14:47	28:52
3. Butch Hadland	12:54	12:45	25:41
4. R. Bauley	13:07	11:42	24:49
5. N. Zotov	12:46	11:43	24:29
6. Marty Shepherd	11:57	11:48	23:45
7. Reg Parham	11:14	11:11	22:25
8. M. Page	10:01	11:20	21:21

**PennyPlane - Best 2 of 6 (3 entries)**

1. Reg Parham	9:15	9:16	18:31
2. N. Zotov	5:50	5:10	11:00
3. John O'Donnell	3:32	3:58	7:30

**FAI Indoor - Best 2 of 6 (9 entries)**

1. John Blount	35:21	30:56	66:17
2. Reg Parham	31:24	32:34	63:58
3. Laurie Barr	31:42	29:50	61:32
4. Paul Masterman	31:06	27:34	58:35

**Open Microfilm - Best 2 of 6 (5 entries)**

1. John Blount	32:34	32:58	67:32
2. Bruce Edwards	29:39	26:33	56:12
3. Paul Masterman	27:29	26:09	53:38

**HLG - Best 2 of 10 (5 entries)**

1. P. Bayram	57	58	115
2. M. Fantham	48	48	96
3. A. Slater	27	45	72

**STATE OF THE ART**

Four of the winners of the 1974 Indoor WCh made their model details available, and these are summarized below and in two drawings. All three of the Polish Team models are shown, along with Karol Rybecky's model, which won the Kopecky Trophy for longest single WCh flight. All available info has been presented, except for some small detail info on Czechowski's model. This additional info will be loaned upon request. I have a half-size drawing from Czechowski; send 24¢ postage with your request to Box 545, Richardson TX 75080.

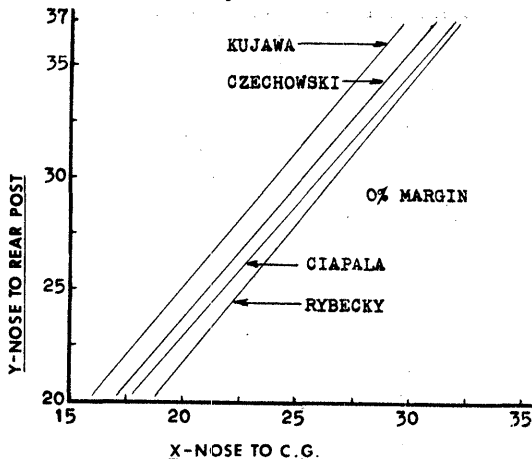
All info on the plans is in metric, prop info and wood sizes below are in inches; the CMOS chart below is metric. It might be instructive to compare these four models:

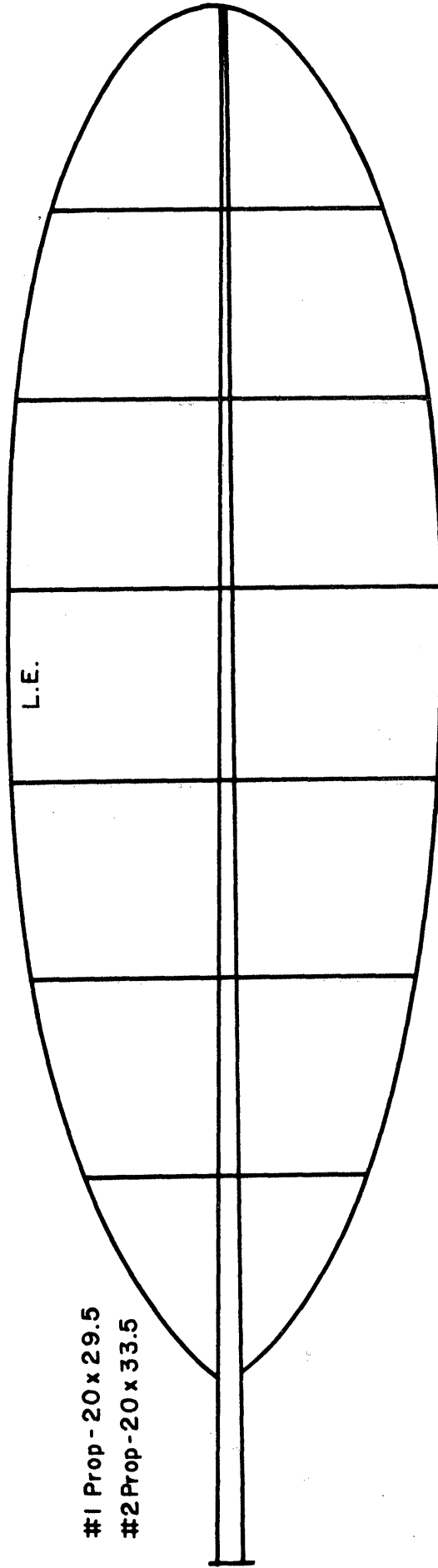
	Wing Area (cm <sup>2</sup> )	Avg. Chord (cm)	Tail Area (cm <sup>2</sup> )	Trim CMOS	INP
Czechowski	1100	17.05	487	+9.8%	+29%
Rybecky	995	15.55	511	+21%	+63%
Kujawa	1074	16.7	546	+0.8%	+15%
Ciapala	1090	16.9	548	+0.2%	+43%

The average wing area is 1064 cm<sup>2</sup> (165 in.<sup>2</sup>) and the average chord is 6.5 inches. At a time when some fliers are planning ever larger wing chords, the performance of these four models suggests that these chords are close to optimum. This is not to say that the "perfect air" model would be this small - just that WCh's seldom have consistent good conditions! Incidentally, comparison of Czechowski's model to Pete Andrews' Time Machine shows a close similarity in area, trim, moments and weight.

**Wood sizes on Czechowski's model:**

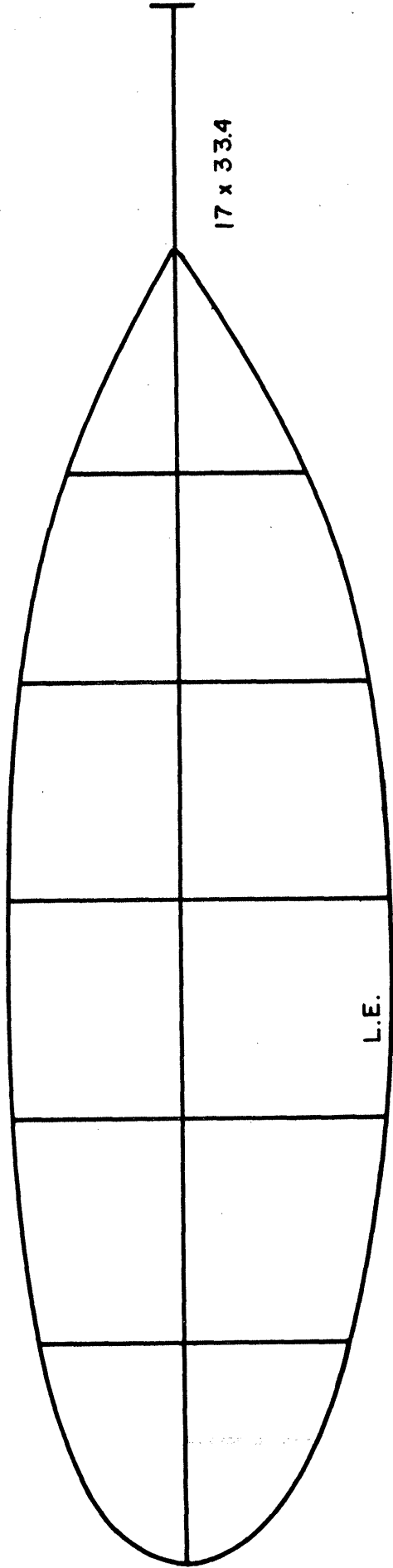
Wing Spar	.035" x .039"	Stab Spars	.039" x .031"
Tips	.028" x .024"	Tips	.024" sq.
Comp. Ribs	.028" x .039"	Ribs	.024" sq.
Other Ribs	.024" sq.	Rudder Outline	.024" sq.
Prop Spar	.108" dia. @ hub	Prop Outline	.020" sq.
Ribs	.020" sq.		





#1 Prop - 20 x 29.5  
#2 Prop - 20 x 33.5

CZECHOWSKI



17 x 334

KUJAWA

L.E.



E.

# INDOOR

## NEWS and VIEWS

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

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

### New Members!

JON BJORNSTAD, 1411 Nova Ave. #101, Hillside MD 20027  
 RICHARD IVERS, 454 Walnut St., Newtonville MA 02160  
 J. B. NUSZER, 61-28 82nd Place, Middle Village NY 11379  
 JON ROGERS, 20 Sylvia Lane, Naperville IL 60540  
 GUIDO C. SPEEDY, 1005 Melrose Dr., Anderson IN 46011  
 RANDY WALLINGFORD, 14430 Clayton Rd., San Jose CA 95127  
 RONALD WILLIAMS, 1364 Lexington Ave., New York NY 10028

### Family Memberships

RICHARD A. IVERS, 454 Walnut St., Newtonville MA 02160  
 BRIAN SPEEDY, 1005 Melrose Dr., Anderson IN 46011

### Honorary Members

BOB BAILEY, 162 York Rd., Stevenage, Herts, SG1 4HQ  
 England  
 DIMITRIS NIKOLAOU, Skogsbaken 14, S 172 41, Sundbyberg,  
 Sweden

### Financial Report - Feedback

It is heartening to note that some of you read the Financial Report closely enough to catch an error - the surplus is \$14.05 instead of \$24.05 as printed. It is a foul canard and a terrible slur to blame my Texas Instruments calculator for the error as one of you did! This typewriter don't add no better than ut spells!

### NIMAS POSTAL MEET

Even though this is the December '74 issue, the time is ripe to announce the 10th Annual NIMAS Postal Meet. It will be for anyone, with regular classes in PennyPlane, HLG and Easy B. Any flights made in sanctioned competition between Jan. 1 and Apr. 28, 1975, plus flights made in indoor sessions between now and Apr. 28 are eligible for entry. Flights made at indoor sessions should be made under conditions conforming to AMA rules. More details will be presented in the Jan. '75 INAV.

### FAI INDOOR REPORT

#### Tentative Wch Site

At the recent CIAM meeting, England was selected to host the 1976 Indoor World Championship, with Romania as an alternate. Final selection will be made at the next Fall meeting (Nov. or Dec., 1975) of the CIAM.

#### Team Qualification Schedule

The Jan. '75 Competition News contains an announcement listing a tentative schedule for the Team Selection Contests to be held this year. These dates are:

West (Santa Ana) Apr. 26-27	West (Santa Ana) Jul. 4-6
South (Tulsa) May 24-25	East (Lakehurst) Jul. 19-20
North (Akron?)* Jun. 7-8	South (Nats) approx Aug. 2-3
East (Lakehurst) Jun. 21-22	North (Akron) Aug. 16-17

Finals (Santa Ana) - Aug. 30-31-Sep. 1, 1975

\*This early, Akron may be unsuitable and it is possible that a Chicago Aronomy may be used instead.

#### Provisional Indoor Event

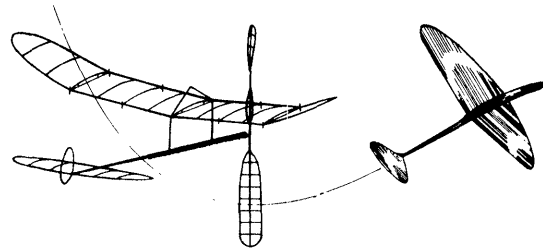
The recent CIAM meeting adopted a provisional indoor model class which calls for models of the following specifications:

The maximum span of the lifting surfaces is 50 cm and the maximum chord is 15 cm.

The maximum distance between the hooks holding the motor is 25 cm. The minimum weight of the model without rubber is 1 gram.

#### CONTEST CALENDAR

CONNECTICUT - Glastonbury  
 Indoor sessions at Glastonbury High Gym; Tuesdays,  
 7 pm-9:30 pm, Feb. 18, Mar. 18, Apr. 8, May 6, June 3,



1975; Sundays, 8 am-12:30 pm, Mar. 9, May 11, 1975. Indoor contests Feb. 9, Apr. 13, 1975. For details, contact George Armstead, 89 Harvest Lane, Glastonbury CT 06033, ph. 203-633-7836.

#### FLORIDA - Miami

Indoor Fly-ins at JFK Gym, Miami Dade North College, 9 am-2 pm (confirm by calling 858-6363), Feb. 2, Mar. 2, Apr. 6, May 4, 1975. Indoor contests at Goodyear Hangar, Opa Locka Airport, 10 am-6 pm, Feb. 16, Mar. 16, Apr. 20, May 25, 1975. Confirm hangar dates. Dr. John Martin, 3227 Darwin St., Miami FL 33133.

#### ILLINOIS - Chicago

Indoor contest at Madison St. Armory in Chicago on Jan. 26, 1975; HLG, PennyPlane, Peanut Scale and Paper Stick. Charlie Sotich, 3851 W. 62nd. Pl., Chicago 60629.

#### MARYLAND - Silver Spring

Indoor sessions at JFK High School on Randolph Rd. in Silver Spring, MD, by D. C. Maxcuters, 7 pm-11 pm, Feb. 14, 21, 28, Mar. 14, 21, Apr. 4, 18, 25, May 9, 16, 30, 1975. Rolfe Gregory, 11603 Milbern Dr., Potomac MD 20854.

#### MISSOURI - Kansas City Area

Indoor contest Feb. 15, 1975 at Park Hill North Jr. High, 8300 N. Congress, Indoor Scale, Peanut Scale, Jr. Peanut, HLG. Indoor contest Mar. 8, 1975 at Park Hill South Jr. High, 6501 NW Linden Rd., Easy B, Indoor Stick. Both contests 12:30 pm-4:30 pm. Contact Roger Schroeder, 4111 W. 98 St., Overland Park KS 66207, ph. 913-648-4265 for details and city location of sites.

#### NEW JERSEY - Union

Indoor sessions at Livingston School on Midland Blvd., Union NJ, on the second Thursday each month thru May, 1975 Contact Dan Domina, 47-01 Fox Run Dr., Plainsboro NJ 08536 for time and details.

#### OHIO - Euclid

Cleveland Free Flight Society Indoor Contest, Euclid Arena, Euclid OH, May 17-18, 1975, HLG, Indoor Stick, FAI Stick, Paper Stick, Peanut Scale, Indoor Scale, Easy B, Jetco ROG, Delta Dart, Scraps. Site has 30' ceiling and 85' x 160' floor. Contact Jim Hyka, 19411 Preston Rd., Warrensville Hts. OH 44128, ph. 475-2381 or Vern Hacker, 25599 Breckenridge, Euclid 44117, ph. 486-3388.

#### OREGON - Albany

Indoor contest at South Albany High School Gym, 3705 S. Columbus St., Albany; Feb. 23, 1975; AMA Scale, Unmodified Kit Peanut, Open Peanut, Popularity Scale, Keyhole Scale, and Scale Old Timer. Contest time 10:30 am-3:30 pm, site open 9:30 am. CD Bob Stalick, 1120 Shady Lane, Albany OR 97321, ph. 928-8101 for more details and special rules.

#### TEXAS - Ft. Worth/Dallas Area

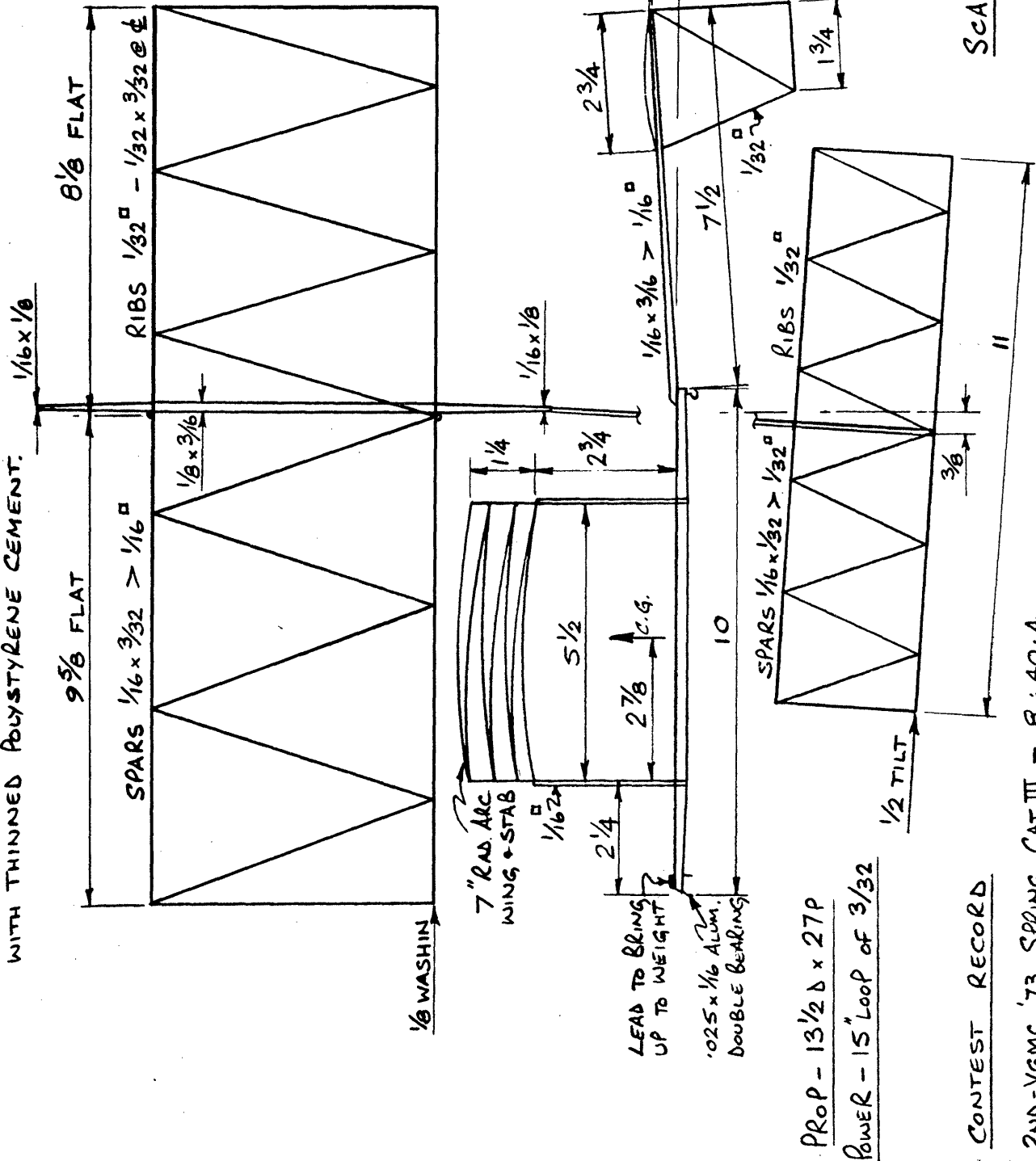
Cliff Cloud Climbers Annual Indoor Model Airplane Contest, Feb. 9, 1975, Meadowbrook Rec. Hall, Arlington TX. HLG, Easy B, PennyPlane, Peanut Scale, Jr. Rubber, 10:30 am-4:45 pm. Contact Mike Fedor, 817-265-0601, for flying schedule and site location. Open contestants must donate \$2 toward site rental.

#### TOP TEN CEILING DODGERS

I hope that the lack of activity in Ceiling Dodgers in recent months is soon remedied. For those who haven't seen or heard of this event, it is a fun way to improve the models and have an informal, on-going contest at the same time. Basically, the idea is to fly any class of model in any given site while trying to get the best time possible without rafterbanging or ceiling scrubbing. The times are fudged to 35' using the standard NIMAS Fudge Factors, then ranked as below. Flights can be made at a contest or Record Trials, or at a flying session where the timing and general conditions conform to standards of an AMA contest (no steering, etc.). Make the flight before a C.D. or other witnesses and send the flight time, ceiling measure (FAI type measurement), and an estimate of the maximum altitude achieved. Anyone may apply.

Name	Time	Ceiling	Fudge	Score
1. Stan Chilton	1115	35'	1.0	1115
2. Tom Vallee	810	20'	1.323	1071.1
3. Robert Dunham II	1454	89'	.627	911.7
4. Hal Crane	682	20'	1.323	902.3

COVERING - LIGHT CONDENSER PAPER APPLIED WITH THINNED POLYSTYRENE CEMENT.  
 WEIGHTS - WING (GRAMS) 0.920  
 PROP 0.640  
 STICK & STAB INC. WEIGHT 1.610  
 TOTAL 3.170



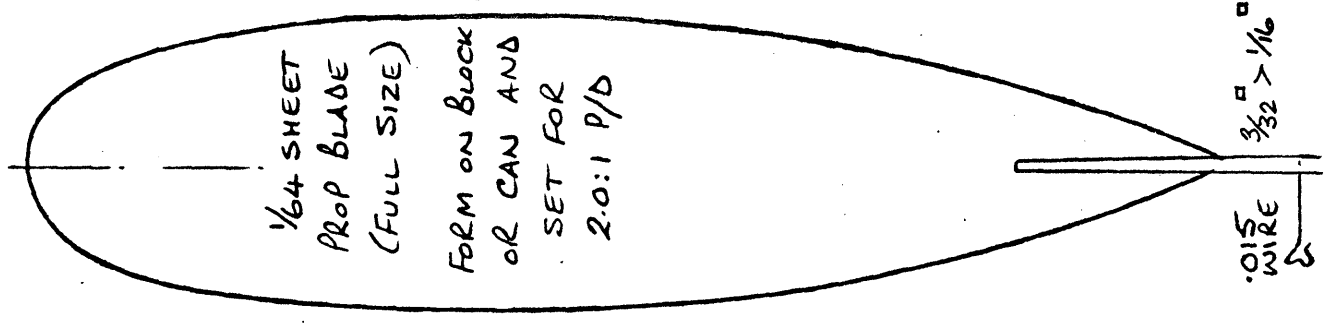
PROP - 13 1/2 D x 27P  
 POWER - 15" LOOP OF 3/32

CONTEST RECORD

- 2ND-VGMC '73 SPRING CAT III - 8:40.4
- 1ST-VGMC '73 INTERNATS CAT III - 7:15.6
- 1ST-NIMAS '73 POSTAL - 20.2' - 410.4 x 1.314 - 6:59.3
- VGMC CAT I RECORD - FEB 4 '73 - 6:50.4
- VGMC CAT III RECORD - MAY 5 '73 - 8:59.2

'POCO-P' PENNY PLANE

BY AL RICHES NOV '73



3/32 > 1/16  
 .015 WIRE

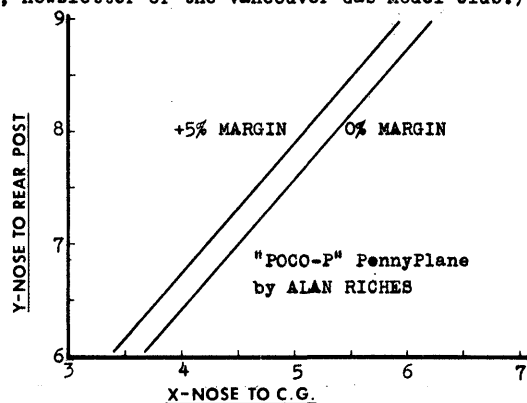
5. Bob Dunham	1357	89'	.627	850.8
6. Bud Tenny	1275	89'	.627	742.9
7. Dick Hardcastle	602	23'	1.234	742.9
8. Hewitt Phillips	528.2	20'	1.323	698.8
9. Howard Haupt	456	22'	1.261	566.2
10. Steve Lovens	433.2	20.5'	1.307	566.2

Both Top Ten Ceiling Dodgers and Top Ten Easy B have been going a number of years. To date, the only recognition anyone gets is the listing in INAV. Would it be fun to have some sort of award that is passed around? Such an award could be a plaque listing past Top Ten fliers, or a gag trophy that each owner has to add something to. Drop a line and make some suggestions!

#### STATE OF THE ART

Alan Riches' PennyPlane, "POCO-P", has compiled an impressive record of performance in Canadian competition, as well as winning the last NIMAS Postal which had P-P as an event. As shown, the model is a solid, conservative design which should do well for anyone. The flight times listed as slightly lower than present U. S. standards, in almost direct proportion to the motor weight and prop size shown (in comparison to U. S. practice). Therefore, a simple increase in rubber weight and enlarging the prop to handle the increased power should boost times directly.

Al's trim was just about 0% margin by CMOS and +9.7% by the INP method. This margin, in both cases, may be a bit small for severe conditions. (Plans copied from HOT HEAD, newsletter of the Vancouver Gas Model Club.)



#### PROP FORUM

The layout on page 4 shows three prop outlines, all of which illustrate theoretical ideas used at the 1972 Indoor WCh.

The prop design used by Vilim Knoch utilizes a swept-back spar which, according to his design theory, should improve power burst performance in two ways. First, consider the small details "A", "B" and "C". "A" shows a normal, non-deflecting prop and the airflow patterns past the blade. In "B", the usual indoor prop is shown as it flares forward under peak torque loads. The effect is to slightly reduce the prop diameter, and to spill air off the blade tips. In "C", Vilim's design serves to increase diameter slightly while causing the blade centerlines to become perpendicular to the air flow while under load. In theory, then, prop efficiency during the climb is greater.

The second point of Vilim's theory is that the blade twist part of the flare should take place around the center line drawn across the blade. If that is so, then the blade area distribution inboard of the third rib is such that positive flare (increased blade angle) will help the center portion of the blade work better during the burst. In the same fashion, the outer blade sections should have negative flare, which should help minimize forward deflection of the type illustrated in "B". Vilim admits extreme disappointment in the prop's performance, noting that too much rubber was required to climb in Cardington and that the RPM was too high. In my opinion, both these problems could be caused by the prop's low diameter. Almost all those who flew at the '72 WCh had larger diameter or more blade area, or both. Simply expressed, a heavier model (one gram) takes more rubber; more rubber requires a large prop to absorb the peak torque without blowing off a lot of the climb energy in excess RPM.

The 1972 (and 1974) German teams used skewed blade area as illustrated in the two Easy B props on page 4. The theory is that the blade will flare positively in the center and negatively at the tips - as expected by Vilim. The weight and stiffness of the props actually built probably minimize any such effect; however, the props and the model easily handle .085 oz. of rubber (four strands of approx. .065" pirelli) in a clean climb. This is more

rubber than anyone I've heard about uses, except possibly Dennis Jaacks. At the 1973 Mats, when TennyPenny placed 8th, that much rubber clearly overpowered the 17 x 27 all-balsa prop, but it flew well. The model still has not been fully adjusted for the 17 x 34 built-up prop, and the 2nd place at the 1974 Mats is inconclusive due to the extreme air disturbance and a rubbing knot. However, the model and prop show every indication that even more rubber can be used as soon as techniques are worked out to cram a fully-wound, high weight (over .09 oz.) motor between hooks on a 10" fuselage.

An additional note - a similar prop layout was used on FAI Penny (won High Ceiling Indoor Stick at '74 Mats). Obviously, I believe in the idea, and expect that when my building skill catches up the the design idea (originated by Gunter Maibaum, German Team Manager), I will have much better props than before. I believe that these props track better, but they are stiff and overweight, which can give exactly the same results! I urge that anyone who tries this concept try to make comparative test flights to help prove the idea.

#### CONTEST RESULTS

LIAMAC Indoor Championships, Hicksville NY, 4/28/74

Jr.-Sr. HLG		Open HLG	
1. Adam Minassian	83.6	1. Dan Domina	80.0
2. Bruce Paillet	75.6	2. Al Vollmer	78.3
3. Barry Paillet	75.2	3. Jack Minassian	76.4
4. Joe Nuszer, Jr.	62.8	4. George Rivers	72.1
		5. Ed Franklin	70.3

Jr.-Sr. Easy B		Open Easy B	
1. Richard Whitten	8:06.0	1. Pete Andrews	10:35.2
2. Barry Paillet	5:04.0	2. John Kukon	9:52.2
3. Mitchell Stewart	4:32.0	3. Al Vollmer	9:28.6
4. Jerry Haynes	1:46.4	4. Frank Haynes	8:47.4
		5. Joe Nuszer	8:34.2

Indoor Stick		Indoor Scale	
1. Pete Andrews	17:59.0	1. Don Garofalov	135
2. Dan Domina	11:06.4	2. Dan Domina	112.2
3. John Kukon	10:41.0	3. Joe Nuszer	108
4. Joe Nuszer	10:11.2	4. Barry Paillet	104.8
5. Richard Whitten	6:06.0	5. Ed Franklin	87.5

Jr.-Sr. Peanut Scale		Open Peanut Scale	
1. Jerry Haynes	54	1. Dan Domina	120
2. Barry Paillet	52.55	2. Don Garofalov	98.7
3. Bruce Paillet	52.50	3. Ed Franklin	71
4. Richard Whitten	13	4. Robert Bender	70.7
		5. Frank Hanyes	70.5

Tech Model Aircrafters' 9th Annual Indoor Meet, 5/4/74  
M.I.T. Army

Indoor Stick		Peanut Scale	
1. John Kukon	19:06.5	1. Dan Domina	349.6
2. Dan Domina	15:15.0	2. Fred Hall, Jr.	256.0
3. Bill Tyler	14:05.2	3. Charles Learoyd	193.1
4. James Fiorello	9:25.7	4. Bruce Paillet	79.1
5. Charles Learoyd	8:22.0	5. James Fiorello	75.1

Jr.-Sr. HLG		Open HLG	
1. Barry Paillet	72.5	1. Dan Domina	71.2
2. Joe King	62.2	2. Allan Vollmer	71.0
3. Bruce Paillet	62.1	3. Kevin Barrett	68.6
4. James Fiorello	46.9	4. Jean Paillet	67.8
		5. G. W. Donahue	64.8

Novice PennyPlane		PennyPlane	
1. Cathy Learoyd	6:05.0	1. John Kukon	9:53.4
2. Henry Hill	5:08.8	2. Charles Learoyd	8:55.5
3. Rhoda Ierger	5:03.8	3. Allan Vollmer	7:55.5
4. Tom Ierger	4:35.0	4. Fred Hall, Jr.	6:37.5
5. Eddie Dowski	2:50.2		

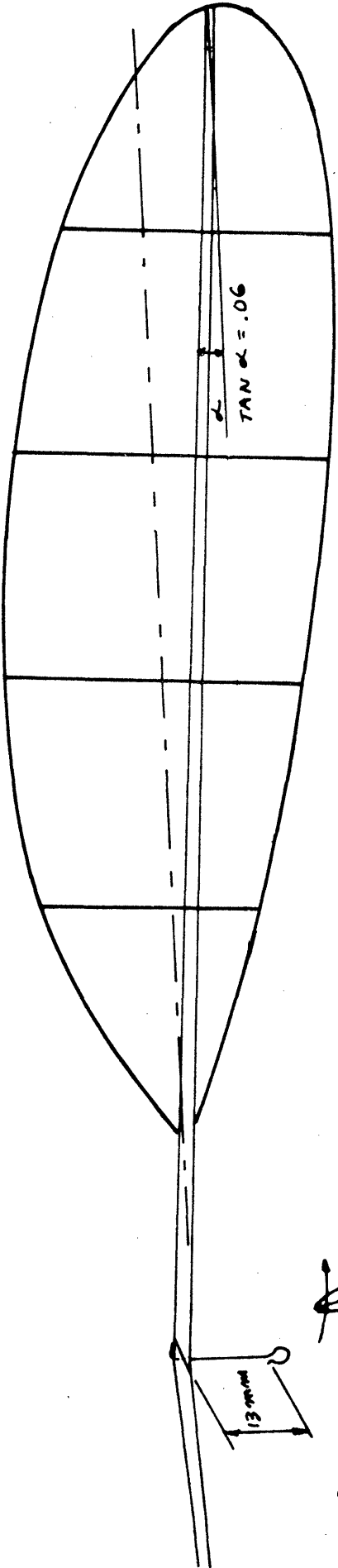
#### INDOOR ELSEWHERE

JELCZ CUP Contest, Wroclaw, Poland, Sept. 28-29, 1974

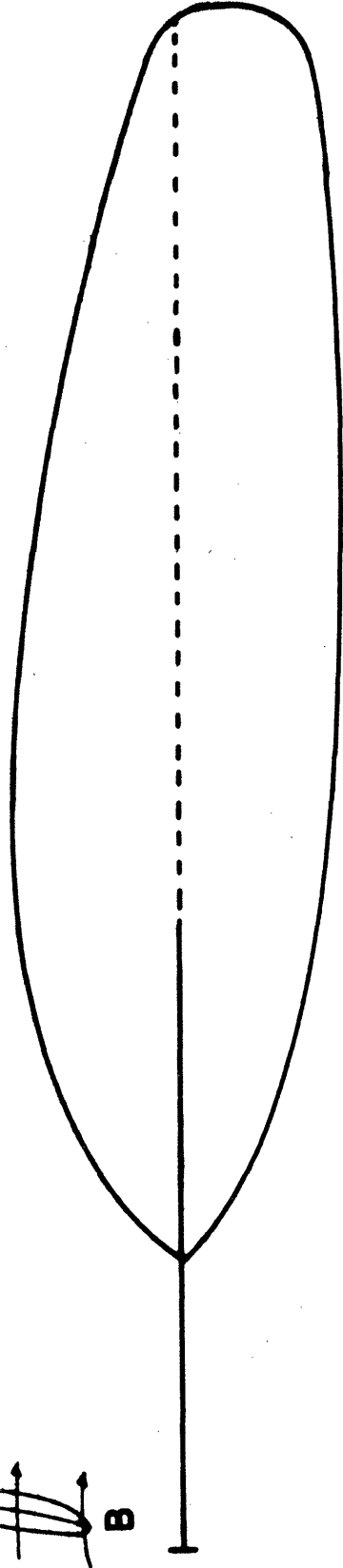
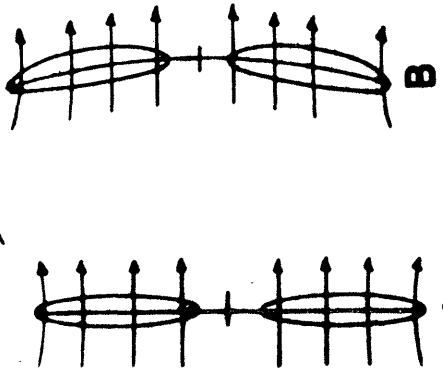
Senior FAI Indoor			
1. Sylwester Kujawa	26:34	27:25	53:59
2. Edward Ciapala	24:27	24:47	49:14
3. Stefan Bombol	23:05	24:29	47:34
4. Zbigniew Szymanski	22:20	22:17	44:37
5. Ryszard Czechowski	21:56	20:35	42:31
6. Jozef Kapusniak	20:00	20:26	40:26
7. Stanislaw Sierko	20:35	18:25	39:00
8. Jan Ochman	20:36	17:00	37:36

Junior FAI Indoor			
1. Jan Zieba	19:25	20:09	39:34
2. Pawel Frackiewicz	19:10	16:48	35:58
3. Zdzislaw Stepien	14:56	10:12	25:08
4. Dariusz Jaszczak	15:21	9:25	24:46

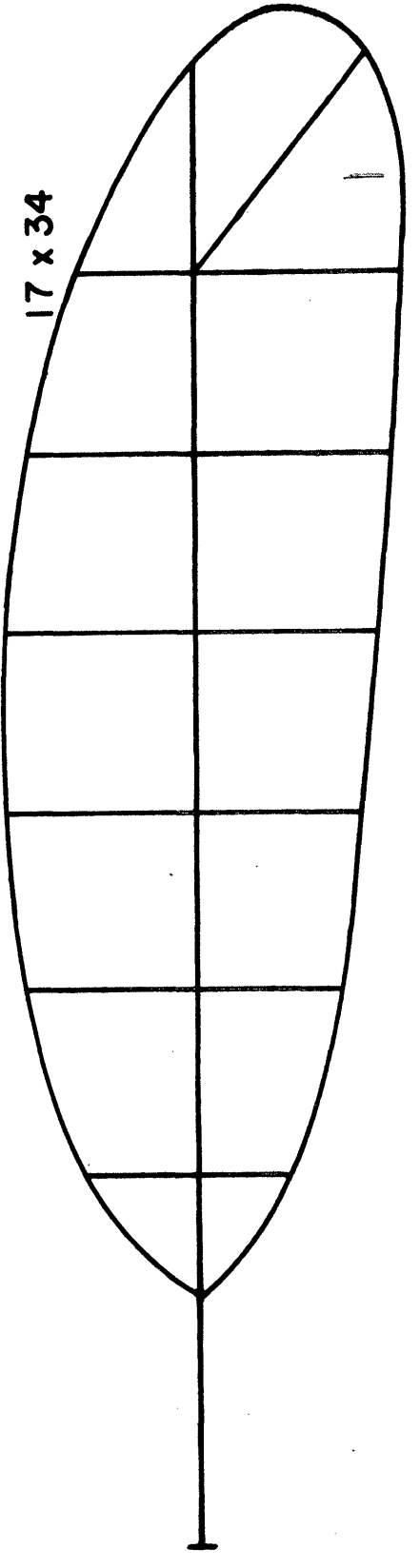
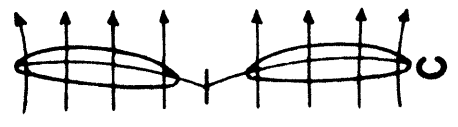




1972 FAI Prop - Vilim Knoch 17.5 x 33.5

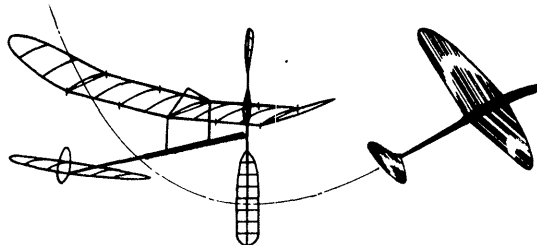


Two for Tenny Penny 17 x 27



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

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

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

WILLIAM A. BELL, 1062 Green Hills Dr., Ann Arbor MI 48105  
 J. D. CRIPPS, 9 Stonehedge Lane, E. Northport NY 11731  
 PHIL HAINER, 11020 Kent-Kangley Rd., Kent WA 98031  
 CATHY LEAROLD, 58 Colonial Village, Amherst MA 01002  
 RONALD LECISTON, 858 Paulison Ave., Clifton NJ 07011  
 PAUL ORTMAN, 8950 E. Emerson Pl. Rosemead CA 91770  
 JAMES TORAN, 1013 Old Ford Rd., Huntington Valley PA 19006

Honorary Members

DAVE TONGWAY, P O Box 491, Denilquin 2710 Australia  
 F. G. TOWER, 14 Westborne Rd., Roleystone 6111,  
 Western Australia  
 NICK ZOTOV, 7 Holland Court, Dereham, Norfolk NR19 1NW  
 England

Contest Board Actions

Present FF Contest Board activity includes consideration of three Indoor rules proposals which have gained tentative approval. FF-76-3 proposes that the FAI model steering rule be adopted for U.S. flying. FF-76-10 would modify Easy B rules to eliminate the "local option" parts of the existing rules plus changing the model characteristics drastically; increase max chord to 4", limit stab to no more than 50% wing area, limit prop diameter to 12", limit motor stick length to 10", allow wood bracing at wing/post joint, set minimum weight of 1.5 grams (.053 oz.), and specify paper covering only. Further, this proposal would create a Junior Easy B event identical in specifications except to require 3 gram weight, and a Novice Easy B event requiring use of a plastic prop and certain specifications on wood sizes for a 3 gram model. Finally, FF-76-12 would establish official rules for PennyPlane and Novice PennyPlane; no change to PennyPlane specifications except to make them official and thus eligible for National Record status. Novice PennyPlane is to be limited to 5" max wing chord, 4" x 12" stab and 12" prop diameter, solid motor stick and boom.

An Editorial

Of the three rules proposals cited above, FF-76-3 and FF-76-12 essentially change no model specifications and will make no waves (essentially, except for individual opinions). However, FF-76-10, which was justified on the basis of the statement, "present rules frequently become a hardship both to the contest organizer and the entrant because of the local option aspects". Originally, the local option aspects of the existing rules served a useful purpose in allowing CD's to tailor contests to fit Easy B sized models then in use as beginner projects. Since that time, the AMA Cub/Delta Dart series has probably fulfilled that purpose admirably; perhaps the time has come to set down firm rules.

However, the proposal goes far beyond this worthwhile goal and totally obsoletes all existing Easy B's on one or more points. Further, the rule expands points that must be checked by the CD from wing span and chord only (can be quickly checked via go-no-go gauges) to a massive total of eight measurements, three of which can be made with gauges. The weight requirement calls for a different scale than those required for either FAI or PennyPlane; the wing area and stab area must be computed after making a minimum of four measurements (non-rectangular surfaces could require many measurements), and then the wing area/stab area ratio must be computed. It seems likely that the author of this proposal is not and never has been a Contest Director! From a purely selfish viewpoint, I strongly resent any rule proposal which would outlaw one of my few viable models. From an esthetic viewpoint, it is totally pointless to spend development time on a new event so closely resembling a current popular event - PennyPlane. As a CD, I simply would refuse to schedule an event which could reasonably take up to 10 minutes or more per model to process! Many indoor contests are limited to three hours or less by site availability, and it would be pointless to so drastically delay the flying with needless processing.

Aero Modeller Annual

Once again, the Aeromodeller Annual has been published. The 1974-75 issue contains an extensive section on ducted fan models and another on Peanut Scale models. In addition, articles on model aerodynamics, variable incidence tails, and numerous model plans continue the strong tradition of excellence this publication has built up in 27 years of continuous publication.

'75 Nats Preliminary - Indoor Center

AMA has announced that the '75 Nats will again be held at Lake Charles, Louisiana. The dates will be Aug. 3-10, 1975. The tentative schedule placed Indoor activity on Aug. 3-4, 1975, at the Civic Center in downtown Lake Charles. Our NIMAS man-on-the-scene, Ted Sachs, at the behest of Dr. John Martin, made some initial contacts. As a result, suggests that all indoor fliers who plan to fly at the '75 Nats try to make reservations at the Downtowner Motor Lodge in Lake Charles. Reservations should be made early, c/o Max Jones, P O Box 3023, Lake Charles LA 70601. Prices: singles - \$15, doubles - \$22.

In addition to a common gathering place, Dr. Martin envisions the possibility of a separate Indoor Awards Banquet, and/or a party immediately after the end of flying. If you favor this idea, drop a line to Dr. John Martin, 3227 Darwin St., Miami FL 33133 and encourage him!

Renewal Reminder

Many INAV subscribers have already renewed their subscriptions in advance, and this is greatly appreciated. It requires about an hour to prepare renewal notices each winter month, unless a substantial number of advance renewals has been received. So, if your label has a "2", "3", or "4" in the corner, your subscription will expire in February, March or April. Please renew early!

Local Records - Why Not!

"The Hangar Pilot" is the well-done newsletter of the Miami Indoor Aircraft Model Association. Editor John Martin often lists Florida records as established by members of M.I.A.M.A. The question might arise "Why Florida records?" Why not? For any area that is just beginning to develop indoor activity, national records may well seem to be totally impossible. By stressing local efforts in comparison to other local activity, the emphasis is shifted to activity which everyone can see as it happens. Any new records, seen first-hand, tend to act as a catalyst to improve one's own performance rather than a discouragement. It might well be worth the trouble for each state or center of indoor activity to keep their own records!

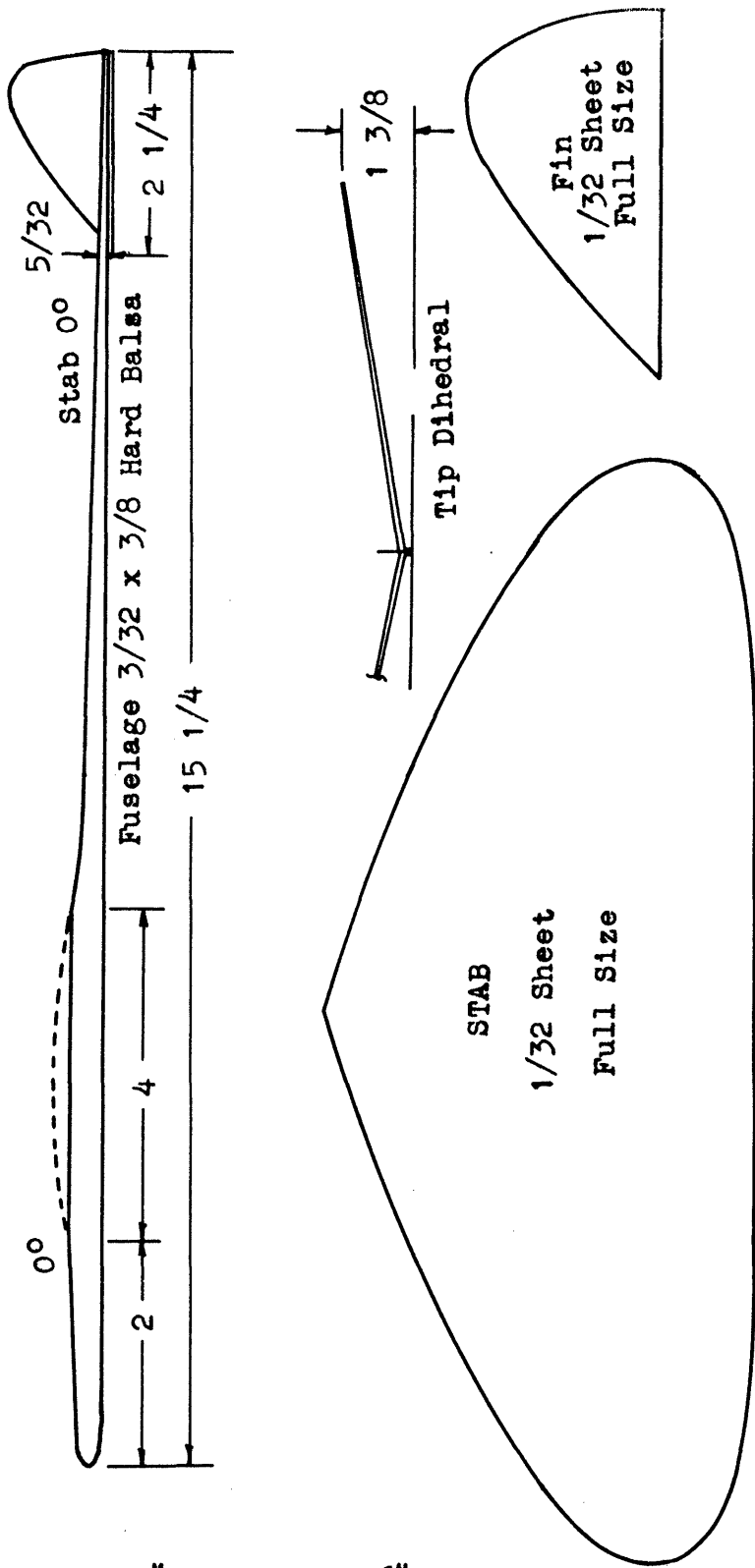
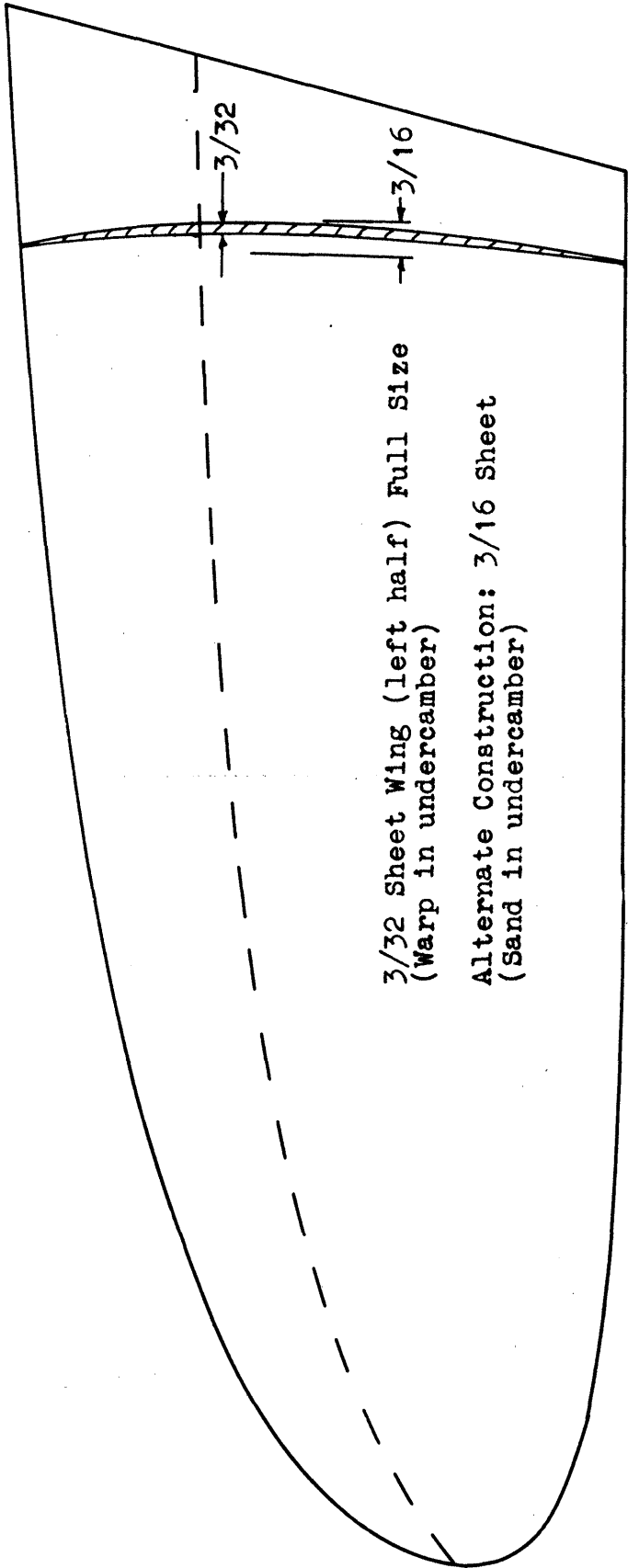
FAI INDOOR REPORTProgram Setback

Recently, the failure of an attempted cross-country balloon flight was widely televised. The visible involvement of personnel from Santa Ana MCAF, and the use of the hangar for balloon storage caused a TV commentator to begin an investigation. As a result, local use of the hangar by civilians has been forbidden. This, of course will force rescheduling and relocation of Team Selection Regional meets which had been scheduled there. It is anticipated that the Finals will be permitted; the distinction seems to be that the Finals will be a national meet. At present, this principle has not spread to any other military installations; let us pray that it does not.

NIMAS POSTAL MEET

The 10th Annual NIMAS Postal Meet will be open for entry through April 28, 1975. All flights made as part of a sanctioned indoor meet from Jan. 1 through April 27 (entry must be postmarked by April 28) are eligible. Also, flights made in informal sessions since receipt of the Dec. '74 INAV (early Feb. '75) are eligible, provided the flights are made in accord with AMA rules.

Events: Easy B, paper covered only, all-wood prop, solid motor stick and boom, no bracing.



"STOMPETTE 16"  
 Designed by Meredith Chamberlain  
 Bloomington, Ind.  
 Best Time: 0:44.0 Bunker Hill A.F.B.

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

PennyPlane: Chicago Aeronuts rules except ceiling contact permitted.

**General Rules:** Free entry. Separate events may be flown at different sessions, but all flights for a given event must be flown on a given day. Please note ceiling height for each entry, using FAI ceiling measure. Ceiling height is used to compute fudge factors to equalize ceiling heights. Separate classes for Junior entrants in each event. Anyone may enter. Send entries to Box 545, Richardson TX 75080.

#### TOP TEN EASY B

Name	Time	Ceiling	Fudge	Score
1. Bob Platt	657.0	19.6'	1.336	877.8
2. Hal Crane	608.0	19.6'	1.336	812.3
3. Dick Hardcastle	634.0	22.0'	1.261	779.5
4. Clarence Mather	531.0	22.3'	1.253	715.5
5. Bill Langley	438.0	20.5'	1.307	572.3
6. Kevin Wehner	431.4	20.5'	1.307	563.8
7. Fudo Takagi	445.0	22.3'	1.253	557.6
8. Alan Riches	422.2	20.2'	1.314	554.8
9. Michael Thompson	347.0	20.0'	1.323	459.1
10. Ted Katsanis	338.0	20.0'	1.323	447.2

#### DOUBLE NIMAS ACE

In an accumulation of flights, which I've just now had time to recognize, Dan Domina logged 13:04 and 16:57.7 in Cat. I Rubber for his Gold and Diamond NIMAS Awards. In Cat. I HLG he logged 36.4 sec. for Diamond Award. With these flights Dan qualifies for Ace in both Cat. I Rubber and Cat. I HLG. In addition, his 23:47 at the '74 Nats at Lake Charles Civic Center qualifies him for Cat. II Silver Rubber Award. In reviewing Dan's total performances, he has reached Gold in Cat. II and Cat. III HLG, and in Cat. III Rubber. That's a lot of very good flying!

#### STATE OF THE ART

The glider shown on the plan page is a reprint from the Dec. '65 INAV as is the commentary to follow. This repeat is spurred by the upcoming low ceiling Nats ('75 Nats at the approx. 55' Civic Center in Lake Charles), in recognition of the special problems of preparing for competition in sites between 45' and 60'.

The model of the month has never set a national record and probably never will; nonetheless it represents state-of-the-art development in a special area. Many sites, both in the U. S. and around the world, are about 45' high. This is well above Cat. I and uncomfortably low for direct competition against Cat. II record marks. In a very real sense, gliders developed in 45' sites are in a class by themselves, since this ceiling height is still low enough that rate of sink doesn't have to be traded off for altitude. The site this model was developed for is a maximum of 45' high, with obstructions at 30', and the maximum width is only 70'. Truly, 44 seconds is excellent time in this site, since the ceiling curves sharply enough that not all the altitude can be used. If you have a 45' site, this may be a good glider for you to try.

#### PERFORMANCE YARDSTICKS

In view of the new (and hopefully, more conducive to model development) Team Selection methods, this column has been envisioned as a forum on techniques related to maximizing model performance. Any technique which helps improve model performance, improve consistency of performance, or helps the flier be sure his model is doing as well as it should on any given flight is appropriate material for this column. Therefore, contributions in any of these areas will be welcome.

#### Flight Profiles

For any flier who really knows his models, the RPM at any given point in the flight is the most solid yardstick of performance available to him. A flight profile, altitude vs. flight time, can be added to the prop data and can yield data for planning strategy. To begin this discussion, examine the two flight profiles on page 4. These profiles were taken by Dan Domina at the 1974 WCh, and enable several conclusions to be made about model capability and about external influences on the flight. Each of the profiles has an anomaly (compared to the "perfect" no-touch flight), and we will examine these first. The profile on Kujawa's 29:45 flight shows an odd shape on the RPM curve. This can probably be explained after examining data on the model (Nov. '74 INAV). The prop is higher than normal pitch (33°) and quite light (.0057 oz.). It is quite likely that the prop flared substantially until the torque dropped off; the remainder of the curve is very normal in shape.

Next, consider the flattened top of the altitude curve from Czechowski's flight. One could guess, without Dan's

comment to that effect, that the model had touched the top lightly.

Under different circumstances, each of these anomalies could have been caused by a different influence. The slow RPM right at launch could have been a rubbing knot that cleared itself out; the flattened altitude curve might have been caused if the model had failed to penetrate an inversion layer.

The shape of the Kujawa altitude curve is close to optimum for a no-touch flight; a similar curve which peaked at the 155' ceiling should have approached 34 minutes. On the Czechowski profile, the RPM curve shape is classical. This emphasis on curve shape is intentional; the absolute values associated with the RPM curve of a given model in ideal trim will differ from those of other models. In similar fashion, the shape of the altitude profiles of any given model will vary drastically with the ratio of rubber length to cross-section, assuming the weight of rubber is constant.

The lone flier may find it difficult to make altitude profiles, particularly in higher ceilings. Extensive experience in a particular site, along with detailed knowledge of the height of various building features, will ease the problem. With practice, it is possible to note when the model is the same height as the hangar catwalk, for example. In this fashion enough points can be taken to define the curve shape. After the data are plotted, two uses can be made of the curves. In ideal air, any altitude profile will give a check of rubber length/cross-section. A profile taken in poor air will help determine the need for a different prop or rubber, or aid in planning flight strategy for the next round.

Regarding rubber choice via altitude profiles: in general, the rubber should be shortened and/or increased in cross-section as much as possible to minimize the rate of descent. Of course, the limit is set when the loop won't take enough turns to keep from dead-sticking, or when too many turns have to be backed off to keep off the ceiling.

Anyone with normal vision and reasonable reflexes can make RPM plots, assuming the site has sufficient light to keep the model visible. Even in poor light, it is sometimes possible to count RPM by watching light flashes from the turning prop. Unlike the altitude profile, an RPM curve is useful when taken in poor conditions. All that is necessary is to watch the model carefully, and avoid taking data during turbulence or strong drift. Simply let the model settle out before starting the count, then note the count and flight time. The standard method of counting RPM is to time how long it takes for the prop to make 10 revolutions. Divide the time by 10 to get average time and divide this average into 60. (For example, if the time for 10 revs was 7.5 seconds, divide 60 by .75 to get 80 RPM.)

The most important feature of the RPM curve is prominent in both the curves shown on page 4. This is the almost level part of the curve during the descent. Failure of the RPM to level off indicates serious trim problems or very poor match between prop and model or very poor choice of rubber length/cross-section. A very steep RPM slope in the climb may indicate excessive cross-section or low prop diameter. Even before a model has gone dead-stick, the drop in torque will cause two changes: The model's nose will drop slightly from the ideal nose-up cruise position, and the RPM will increase slightly. When the torque falls below that required for level flight, the props quit pulling and the model then pushes the prop to keep RPM up.

Once the model has been adjusted, even poor air will not significantly alter the RPM/flight time curve shape. Once the flier knows his model's RPM curve, any change can quickly be spotted. A very subtle change in incidence can increase RPM by 3% or more. 3% of 30 minutes is 54 seconds - a healthy margin at many contests! Thus, it pays off when one has the habit of checking RPM each flight.

#### CONTEST RESULTS

Cleveland Free Flight Society Indoor Contest, 5/12/74  
Euclid, Ohio

#### Jr.-Sr. Easy B

1. Tom Mzik	5:54
2. Tom Sova	5:05
3. Chris Clemens	4:26
4. Joe Mekina	2:37
5. Pete White	2:36

#### Open Easy B

1. Joe Sova	8:04
2. Mike Thompson	7:05
3. Gerald Skrjanc	6:41
4. Robert Mullins	5:43
5. Vern Hacker	5:38

#### Paper Stick

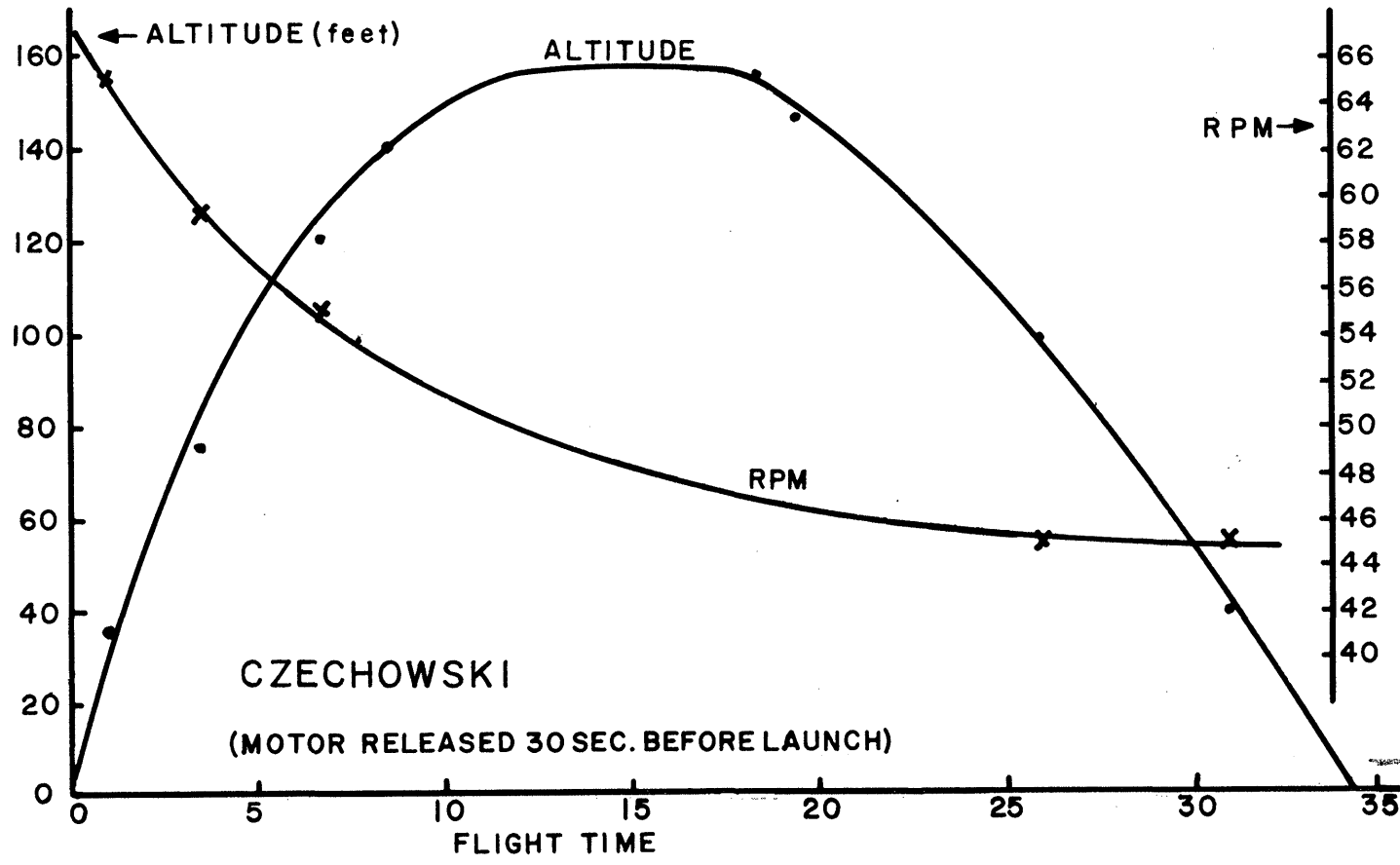
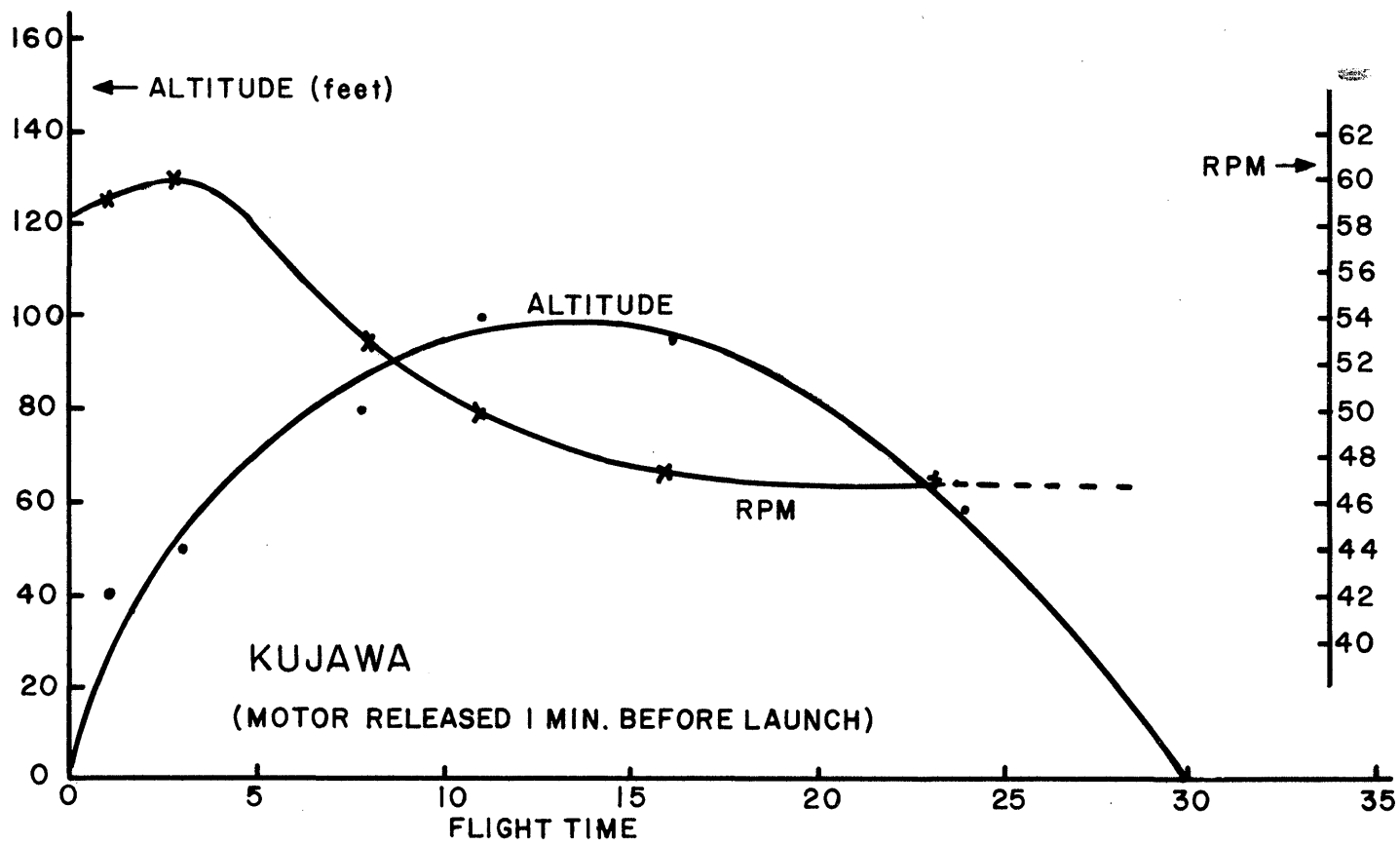
1. Gerald Skrjanc	8:41
2. Larry Mzik	6:56
3. Joe Sova	6:33
4. Vern Hacker	6:24
5. Tom Sova	5:55

#### Indoor Stick

1. Gerald Skrjanc	11:36
2. Tom Sova	10:03
3. Vern Hacker	9:35
4. Mike Thompson	8:40
5. Peter White	6:31

#### Peanut Scale

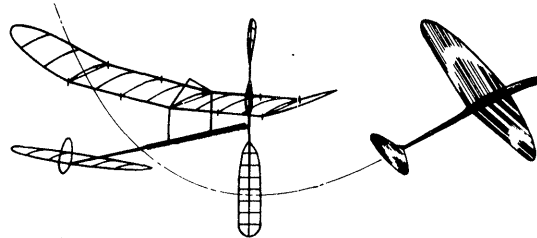
1. Gerald Skrjanc	363
2. Robert Masters	249
3. James Hyka	173
4. Mike Thompson	161



# INDOOR

## NEWS and VIEWS

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



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

New Members!

- G. W. CRISS, Jr., 1386 Monterey Blvd. NE, Snell Isle, St. Pete FL 33704
- TERRY CRONBURG, 11 Highland Terr., Marblehead MA 01945
- GERALD W. DONAHUE, 44 Topsfield Circle, Shrewsbury MA 01545
- GEORGE A. HUME, 26359 Eshelman Ave., Lomita CA 90717
- DAVE LUDKE, 525-B Hilliard St., Manchester CT 06040
- KENNETH F. MACDONALD, 74 Russell St., Bath ME 04530
- ELMER D. MILLER, 2438 Tracy Ave., Kansas City MO 64108
- DAN O. O'MALLEY, 835 Gayer Dr., Medina OH 44256
- LIGON SMITH, Jr., 6800 E. Mockingbird, Dallas TX 75214
- PHIL SULLIVAN, 3021 Spring Valley Ct. Anderson CT 46011
- DALE WANGEMAN, PSC 1, Box 2485, McChord AFB WA 98438

Change of Address

Bucky Servaites has moved to a new home at 7660 Duffield Circle, Centerville OH 45459.

Dave Linstrum has returned from Beirut, and is back at home: 2023 Woodleigh Dr. W, Jacksonville FL 32211.

Recent Publications

The May '75 MODEL AIRPLANE NEWS has published "Big D" by Al Rohrbaugh. This is Al's story of his 50+" wingspan AMA "300" which placed 3rd at the '73 Nats and won the Stout trophy at the '74 Nats. Both flights were at the Jones Armory in Chicago, and demonstrated the low ceiling potential of this design. Thanks to Al and MAN for this coverage!

Model Museum

Those who know Dick Sherman know him as an avid booster of model aviation. In the past few years, he has set up a model museum at his home. In order to increase his coverage, he would like to have indoor models for display. That includes both old and new style indoor models, and he hopes to create a display on the history of indoor modeling. Anyone who can help him with either models or historical data please drop Dick a line at 408 River Road, Tew sbury MA 01876, ph. 617-851-6355.

Oldtimer Catalog

Oldtimer Models, P O Box 18002, Milwaukee WI 53218, has issued a new catalog. It is a fascinating potpourri of oldtimer, scale, and modern items; for example, a twin pusher kit, compressed air motors, Korda's 1939 Wakefield winner and a PennyPlane kit. Many specialty items at a fair price - send stamped, self-addressed envelope for your very own catalog!

Postal Reminder

Some entries have been received for the 10th Annual NIMAS Postal Contest; entry deadline (postmark) is April 28, 1975.

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

Use straight-line interpolation for ceilings between listings; convert inches to decimal fractions of an inch.

FAI INDOOR REPORT

FAI Contests Set

Word has been received from John Kukon that the two East Coast FAI Qualification Trials have been set for June 21-21 and July 19-20, 1975. Call 609-737-3522 Thursday or Friday evening before the meet to confirm hangar availability.

CONTEST CALENDAR

CANADA - Port Coquitlam, B.C.

Indoor contest at the Agradome, Apr. 26, 1975, 10 am to 4 pm, PennyPlane, Open Stick, Scale, HLG. Alan Riches, 1568 Celeste Cres., Port Coquitlam, B.C., Canada.

CONNECTICUT - Glastonbury

Indoor sessions at Glastonbury High Gym; Tuesdays, 7 pm-9:30 pm, May 6, June 3, 1975; Sundays, 8 am-12:30 pm, May 11, 1975. George Armstead, 89 Harvest Lane, Glastonbury CT 06033, ph. 203-633-7836.

FLORIDA - Miami

Indoor Fly-in at JFK Gym, Miami Dade North College, 9 am-2 pm (confirm by calling 858-6363), May 4, 1975. Indoor contest at Goodyear Hangar, Opa Locka Airport, 10 am-6 pm, May 25, 1975. Confirm hangar date, Dr. John Martin, 3227 Darwin St., Miami FL 33133.

ILLINOIS - Chicago

2nd Annual Midwestern States Indoor Championships, May 17-18, 1975 at the Madison St. Armory, 2653 W. Madison St., Chicago. Paper Stick, Indoor Stick, Cabin, FAI Stick, HLG, PennyPlane, Peanut Scale, AMA Scale. CD's: George Gordy, 2901 Prairie, Brookfield IL 60513 and Buddy Equitz, 4543 N. Keystone Ave., Chicago IL 60630.

MARYLAND - Silver Spring

Indoor sessions at JFK High School on Randolph Rd. in Silver Spring, MD, 7 pm-11pm, April 25, May 9, 16, 30, 1975. Rolfe Gregory, 11603 Milbern Dr., Potomac MD 20854. FAI Cat. I Record Trials, National Guard Armory, 2831 East Randolph Rd., Silver Spring, Apr. 27, May 11, June 29, 1975. Tom Vallee, 444 Henryton So., Laurel MD 20810, ph. 301-498-0790.

NEW JERSEY - Union

Indoor sessions at Livingston School on Midland Blvd., Union NJ, on the second Thursday each month thru May, '75. Dan Domina, 47-01 Fox Run Dr., Plainsboro NJ 08536.

NEW JERSEY - Lakehurst

Indoor sessions at Lakehurst #5, Apr. 20, May 10, 25, July 4-5, 1975. Confirm hangar availability by calling 609-737-3522 on Thursday or Friday pm before meet.

OHIO - Cincinnati

SWOFF 4th Annual Indoor Contest, May 4, 1975, Univ. of Cincinnati Fieldhouse, AMA Stick, Paper Stick, Peanut Scale, HLG. Don Wright, 3349 Morrison Ave., Cincinnati OH 45220.

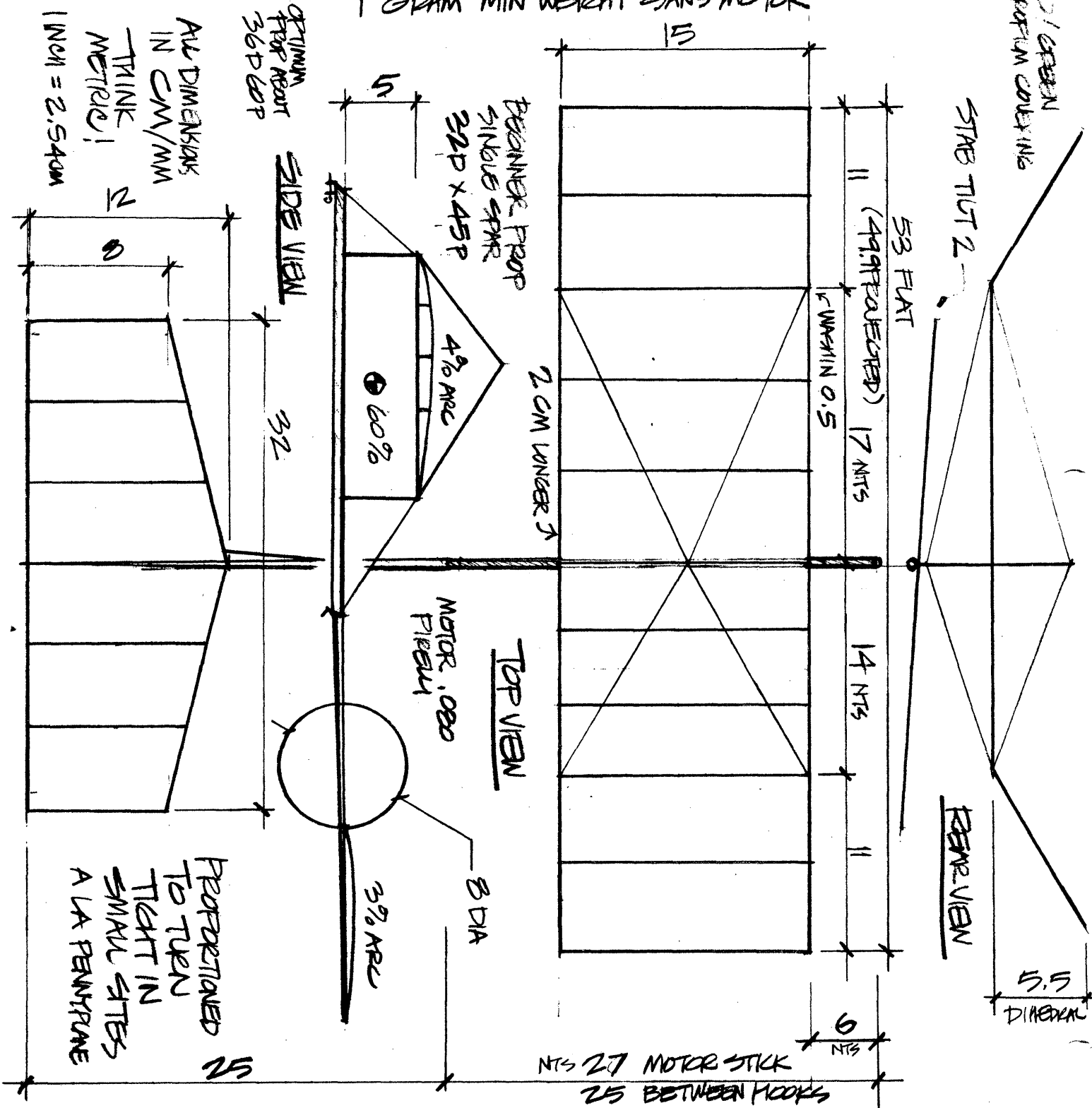
OHIO - Euclid

Cleveland Free Flight Society Indoor Contest, Euclid Arena, Euclid OH, May 17-18, 1975; HLG, Indoor Stick, FAI Stick, Paper Stick, Peanut Scale, Indoor Scale, Easy B, Jetco ROG, Delta Dart, Scraps. Site has 30' ceiling and 85' x 160' floor. Contact Jim Hyka, 19411 Preston Rd., Warrensville Hts. OH 44128, ph. 475-2381 or Vern Hacker, 25599 Breckenridge, Euclid OH 44117, ph. 486-3388.

PERFORMANCE YARDSTICKS

The information presented below represents one of the most comprehensive approaches to choice of rubber motor size we have seen. It is presented by Dennis Jaecks, and he acknowledges other important contributions. The method

SPECIFICATIONS: 50 CM MAX PROJECTED SPAN 15 CM MAX CHORD  
 25 CM MAX DISTANCE BETWEEN HOOKS  
 1 GRAM MIN WEIGHT SANS MOTOR



"HUNGARIAN GOULASH" INDOOR  
 FOR EVALUATION OF FAI PROVISIONAL EVENT CIAM 12/74

FOR INDOOR BEGINNERS

may seem cumbersome at first, and referring to the chart will perhaps be a bother. Nonetheless, the method of rubber selection presented here has the capability of almost totally eliminating model performance variations due to inappropriate rubber choice. It does require detailed record keeping and consistent application of the method; such is the price of the consistency presently needed to excell in FAI Indoor.

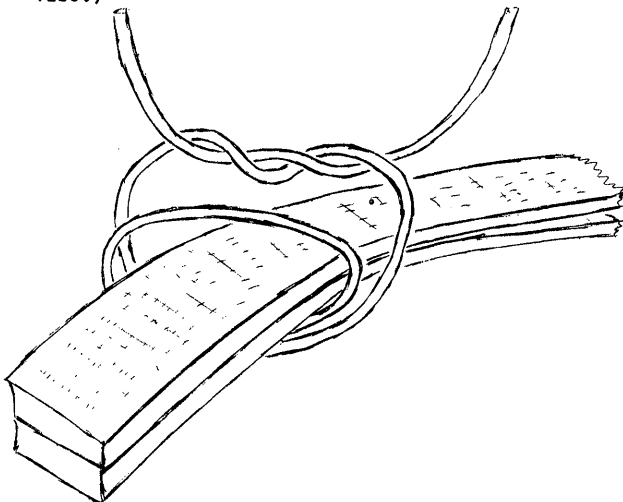
**CHOICE AND PREPARATION OF INDOOR RUBBER MOTORS**

By Dennis Jaecks

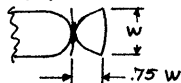
Let's begin with the knot I use; it was suggested by Jim Richmond and has worked very well for me. Please understand: if your own knot is satisfactory, use it. It has been my experience that it is easier to make the motor length consistently accurate with this knot. It will soon be clear that accurate rubber length is the foundation of this system, so whatever knot you use, the important factors are rubber length and rubber weight.

**Steps in Tying Rubber Motors**

1. Cut motor to size: select rubber thickness and measure a length exactly twice the motor length + one inch. (I spend much effort doing this exactly since the whole method depends upon accuracy at this point.)
2. Apply Pliobond cement to 3/4" of both ends of the motor in this manner: I take care to line up the ends and eliminate ribbon twists in the loop; apply cement to one end then run the whole strip between my fingers to the other end and cement the rubber face-to-face. It takes just one coat of cement, then push together.
3. Tie thread around the motor exactly 1/2" from the end, using the knot pictured below: one full turn of thread around and again with a double twist knot. The knot is made with a two-turn half hitch pulled snug. Now grasp both sides of the rubber, stretch it, pull the thread tight and add one half hitch and pull tight. Apply a light coat of Pliobond to the knot and let it dry. Note that most of the Pliobond will rub off the motor during break-in but the knot retains enough to hold very well. At first, this tying procedure requires four hands, but it is possible to develop a technique for solo tying. My method is to hold one end of the thread in my teeth and wrap the loose end of thread around the third and fourth fingers of my right hand. The motor is held with the thumb and index finger of my right hand and I stretch the knot by pulling with my left hand. I stretch the rubber and tighten the thread at the same time; the double twist half hitch holds long enough to release tension on the rubber and tie another half hitch to complete the knot properly. (Ed. note: Pete Andrews clamps the glued end of the motor in a miniature vise, stretches the rubber, and ties the knot flush with the jaws of the vise.)



4. Trim off the rubber and excess thread; leave about .06" of thread and cut the rubber to about 75% of the rubber width as shown below.



5. The proper thread is important. J. & F. Coats cotton covered polyester thread or Lilly brand spun polyester thread. Test other brands by breaking - threads vary in strength. For PennyPlane I use a heavier linen thread.

**Rubber Selection Guide**

The chart on page 4 is the result of reducing avail-

able rubber information to a working overview so that motor selection can be most effectively made. All data presented has been generated from two basic formulas by Charlie Sotich:

1.  $W = .046 T \times L$

2.  $N = 6.35L \sqrt{L/W}$

where W = weight in ounces, N = turns, L = length of motor loop in inches and T = thickness (width of strip). From (1) I derived (3):  $T_{std} = W / (.046 \times L)$ . Using (3) I began plotting turns, weight, etc. and found some interesting trends. The result is the rubber selection chart.

On the chart, the top line shows a relative safe torque value for each thickness of rubber. The next line is rubber thickness (width). Since I use 13" and 14 1/2" motor sticks, the % value is indicated in the left-hand and right-hand vertical columns. This value is used to plan rubber selection (see Triple Whammy For Rubber, Jan. '74 INAV). A typical range of motor sizes are listed. Motor turns can be found at the intersection of the horizontal line from motor length (column "L") and the vertical line from motor weight (second line "W"). For example, a 16 1/2" loop of .056 rubber should take 2034 turns. NOTE: the value .056 is computed from (3) above - do not rely on physical measurement of strip width! By moving on the diagonal from 2034 (either up to the right or down to the left), the rubber weight of .042 oz. is found. If you would like a heavier motor with the same number of turns capability, select one .002" thicker and 1/4" longer for approximately 5% increase in weight. It is helpful to color the squares on the diagonal with map color pencils to speed up rubber selection and minimize chances for error in the heat of the battle.

I make up several motors in a given range based on the model weight and Triple Whammy theory and record all pertinent data on the envelopes which are preprinted with a form as shown below:

LOT# 3-7211-1B m=.0420 16 1/4 X .056

1	2	3	4	5	6	7	8	9	10
TURNS 2034		TORQUE	STRETCH	DATE	TIME				
		(37 RATED)							
1	1500	.3	5X	3/21/74	BREAKIN				
2	1825	.35	5X	3/21/74	"				
3	2025	.40	5.5X	3/21/74	"				
4	2030	.42	5.6X	7/2/74	25:12				
5									
6									
7									
8									
9									
10									

The data is decoded thus: Lot# - a code to identify the original batch of rubber, m = weight of motor in ounces, 16 1/4 - length of loop, .056 - calculated from (3), 2034 - turns from selection chart, (.37) - estimated torque. The rest of the data makes a record of the use of the motor during and after break-in. Incidentally, all these data apply to new, unstretched motors.

Obviously, one will not create identical motors from the same batch. However, motors made this way can be compared to others of the same batch with great predictability. Some fliers use weight only as a guide, but when changing length for some reason, the standard width guide will enable one to pick motors with better results. Also, the guide can be used to plan what motor size to make up if one is not available.

The chart does more for me than nomographs in terms of picturing the same information. The relationships between rubber size, turns and weight are clearer and this makes rubber selection easier, particularly to some formula such as Triple Whammy guidelines of 1.2 power/weight ratio and length 15% longer than the motorstick. One can quickly spot the motor size to start with, and what direction to go in making a new motor if the test motor didn't work out. In particular, until I worked out the numbers for the guide, it was not obvious what the various relationships were between length, weight and turns for small changes.

This whole approach is obviously an oversimplification of the total problem, but I feel it is a step toward improving performance and a definite aid in motor selection.

**A CHANGE OF PACE**

As will become increasingly apparent, Dave Linstrum's creativity doesn't turn off even when he is separated from model activity by thousands of miles. During his sojourn in Beirut, he pondered the CIAM approval of a 50 cm provisional indoor class. The plan page this month shows Dave's idea of what to build for the new class; he also drew a full-size plan. If enough people are interested, some blue-line reproductions of Dave's plan will be made available at cost and a CMCS balance chart will also be furnished. Incidentally, this may be the first 50 cm design worked up outside of Hungary - be the first in your neighborhood with a 50 cm provisional FAI model!



**RUBBER SELECTION GUIDE**

		T	.35	.36	.37	.38	.39	.40	.41	.42	.43	.44	.45	.46	.47		
$\frac{1}{16}$	L	W	.054	.055	.056	.057	.058	.059	.060	.061	.062	.063	.064	.065	.066	L	% 13
96	114			.0347	.0354	.0360	.0367	.0373	.0380	.0386	.0393	.0400	.0407	.0413	.0420		
98	114 $\frac{1}{2}$	.0347	1781	1767	1753	1736	1722	1706	1693	1680	1666	1654	1641	1627	1615	114	107
100	114 $\frac{3}{4}$	.0354	1813	1800	1783	1769	1752	1737	1723	1710	1696	1683	1670	1656	1644	114 $\frac{1}{2}$	109
102	114 $\frac{1}{2}$	.0360	1845	1830	1815	1800	1783	1768	1754	1740	1726	1713	1699	1685	1673	114 $\frac{3}{4}$	111
103	15	.0367	1876	1861	1847	1831	1813	1798	1794	1770	1756	1744	1728	1714	1701	114 $\frac{1}{2}$	113
105	15 $\frac{1}{2}$	.0373	1908	1893	1878	1862	1844	1829	1814	1800	1785	1772	1758	1744	1730	15	115
107	15 $\frac{3}{4}$	.0380	1940	1924	1909	1893	1875	1859	1844	1830	1815	1801	1787	1772	1759	15 $\frac{1}{4}$	117
108	16	.0386	1972	1956	1940	1924	1905	1890	1874	1860	1845	1831	1816	1801	1788	15 $\frac{3}{8}$	119
110	16 $\frac{1}{4}$	.0393	2004	1987	1972	1955	1936	1920	1905	1890	1875	1860	1846	1830	1817	15 $\frac{1}{2}$	121
112	16 $\frac{3}{8}$	.0400	2035	2019	2003	1986	1967	1951	1935	1920	1905	1890	1875	1859	1846	16	123
113	16 $\frac{1}{2}$	.0407	2067	2050	2034	2017	1998	1981	1965	1950	1934	1919	1904	1888	1875	16 $\frac{1}{4}$	125
115	16 $\frac{3}{4}$	.0413	2100	2082	2066	2048	2028	2012	1995	1980	1964	1949	1934	1918	1903	16 $\frac{3}{8}$	127
117	17	.0420	2131	2114	2097	2079	2059	2042	2026	2010	1994	1978	1963	1947	1932	16 $\frac{1}{2}$	128
119	17 $\frac{1}{4}$	.0427	2163	2145	2128	2110	2090	2073	2056	2040	2024	2008	1992	1976	1961	17	130
120	17 $\frac{3}{8}$	.0434	2195	2177	2160	2141	2121	2103	2086	2070	2053	2038	2022	2005	1990	17 $\frac{1}{2}$	132
122	17 $\frac{1}{2}$	.0441	2226	2208	2191	2172	2151	2134	2116	2100	2083	2067	2051	2034	2019	17 $\frac{3}{4}$	134
124	18	.0448	2258	2240	2222	2203	2182	2164	2147	2130	2113	2097	2080	2063	2048	17 $\frac{1}{2}$	136
		.0455	2290	2270	2253	2234	2212	2194	2177	2160	2143	2126	2109	2092	2076	18	138
			.0462	.0470	.0477	.0484	.0492	.0499	.0507	.0515	.0523	.0530	.0538	.0546			

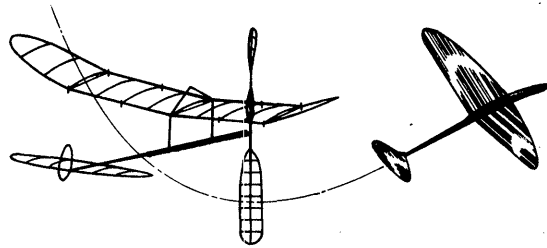
**AMA & FAI PAPER & CABIN**

P/W	.0320	.0353	P/W	.0420
0.95	.0304	.0335	0.95	.0399
1.00	.0320	.0353	1.00	.0420
1.05	.0336	.0370	1.05	.0440
1.10	.0352	.0388	1.10	.0462
1.15	.0368	.0405	1.15	.0483
1.20	.0384	.0423	1.20	.0504
1.25	.0400	.0441	1.25	.0525
1.30	.0416	?	1.30	.0546

# INDOOR

## NEWS and VIEWS

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



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

#### New Members!

CHARLIE SAUTER, 2249 Delaware, Ann Arbor MI 48103

#### Honorary Members

BRUCE EDWARDS, 31 Avenue Rd., Leamington Spa, Warwickshire  
England  
DAVE GOODWIN, 33 The Fosters, High Green, Sheffield  
S30 4NB England

#### This Issue

Since there have been queries about missing issues, etc., please note that this issue is abbreviated in order to get it out a bit sooner. It is, of course, at least six weeks late, so every little bit helps. The next issue may be a combined issue, as unsatisfactory as that is to me. However, that would put things mostly on schedule, so don't be surprised!

#### Correspondence

Another thing which is lagging around here is answering the mail. Only the absolute minimum of this has been going on, as many of you have discovered. It has gotten so bad that some contest notices and other dated info have been covered up or lost, and thus missed the issue they should have been in. I deeply regret this lack of personal time; if I owe you an answer about a really important matter, please send a second letter or card and mark it "second notice". I will try to give those priority, and will try to eventually answer all mail not hopelessly outdated when I get to it. Thanks for your patience!

#### New Hangars Coming?

The Mar. '74 issue of TECHNOLOGY FORECASTS contains an article which suggests that monster airships, with displacements larger than the dirigibles of the 1930's, may be in operation by the 1980's. This concept has surfaced periodically in the past few years, with experts citing the airship's capability for lifting massive weights and transporting them long distances. The airship is faster than barge and approximately competitive with water transport, without being limited to waterways. Delivery times are predicted as 100 hours to any place on earth. Another advantage cited is the lack of airfield requirements; one scheme postulated that cargo off-loading would be done by helicopter so that the airship need never land except for major maintenance. While studies are under way in England and Germany, it is reported that Russia is making the most serious plans. Lack of waterways and high maintenance cost of highways in Siberia make the airship very competitive economically. This may not be as true in other parts of the world.

The above paragraph was prepared several months ago. A more recent issue of TF underscored the unlikelihood of development of dirigibles in this continent.

#### FAI INDOOR REPORT

##### Zone Qualification Trials

<u>Western Zone</u>	May 24-25, 1975, Edwards AFB* July 4-5, 1975, Edwards AFB*
<u>North Central Zone</u>	June 6-7, 1975, Pompeian Court, West Baden, Indiana Aug. 16-17, 1975, Goodyear Aerospace Hangar, Akron Ohio
<u>South Central Zone</u>	June 15, 1975, American Airlines Hangar, Tulsa, Oklahoma* Aug. 2, 1975 - site to be selected*
<u>Eastern Zone</u>	June 21-22, 1975, Lakehurst July 19-20, 1975, Lakehurst

\*Tentative information

Contact personnel: Western Bob Randolph  
25145 Lawton Ave.  
Loma Linda CA 92354

North Central Bucky Servaites  
7660 Duffield Circle  
Centerville OH 45459  
513-433-0975

South Central Bob Dunham  
4730 S. Yorktown Ave.  
Tulsa OK 74105

Bud Tenny  
P O Box 545  
Richardson TX 75080

Eastern John Kukon  
14 Brandon Rd.  
Trenton NJ 08638  
609-737-3522

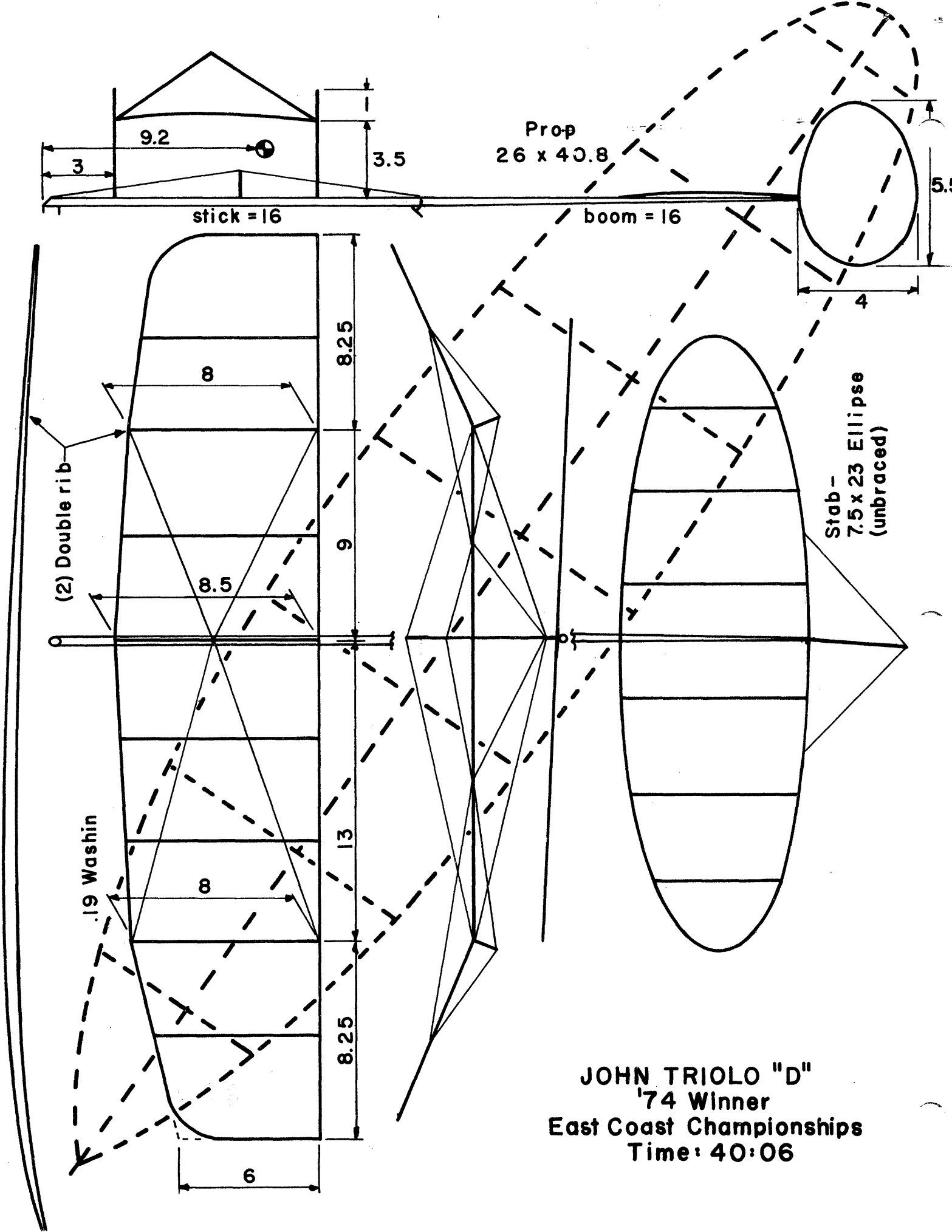
#### Team Selection Commentary

A number of people do not understand parts of the new Team Selection Program, or do not realize what personal benefits accrue from various choices. Let's review the Program briefly:

1. Eight Zone contests will be held. Each Program entrant may enter any or all these contests, but only his two best scores will count. At each contest, each of six rounds will be scored. An entrant's score is the total of his best three rounds. All entrants who score at least 80% of the winning score for each of two Zone contests are eligible to enter the Finals.
2. The Finals will be scored round-by-round just as in Zone meets, and each entrant's score will be computed from his best three of six round scores. This total will then be multiplied by three and added to the cumulative score from Zone contests. The 1976 U. S. Indoor Team will be those qualifiers who have the top three scores.
3. A major portion of entry fees from the Program will go toward refunding qualifier's travel expenses to the Finals meet. These funds will be awarded on the basis of Zone contest score totals in this way: assuming funds are sufficient, the top three scores will receive full airline fare to the Finals, the next three scores earn one-half fare, and the next three receive one-quarter fare. If the funds are insufficient, the awards will be scaled to the available funds.
4. The intent of the program designers has been to attack the major weaknesses of past programs: lack of determined competition during qualification phases of the programs; the effect of two or three "good" rounds on Finals scores; and the discouraging effect of travel costs on entry. In past programs, there was no reason to risk models by flying hard to qualify for the Finals. As a result, few qualifiers had experience under pressure, and those who might have had flawed models or poor flying strategy did not find this out until the Finals - too late to help develop better competition for those soon to be the Team. Further, round scoring will help develop better all-weather fliers - needed for effective WCh participation. The expense grants should encourage fliers who might not enter because of possible travel expenses.

With this background, consider these questions:

1. Is there an advantage to flying one or both qualifying rounds in another Zone? This depends upon many factors. Central Zone fliers with a good first round score might benefit from high ceiling practice. Those fliers who are surrounded by many very good fliers may gain a higher total score by flying in another Zone.
2. What can I lose by flying only in my own Zone? Nothing. Anyone who wins both Zone contests in his Zone is assured of financial help in reaching the Finals and has exactly the same points advantage in the Finals as someone who flew cross-zone exclusively.
3. What can be gained by entering more than two Zone contests? The two most obvious reasons for entering an extra contest are: less competition in another Zone, or to recoup a poor showing in one local contest. However, suppose a flier has a score qualifying him for travel assistance, and then gets a good score in another Zone. He may improve his present score, but more important to his Finals score, a good score in another Zone will reduce the



**JOHN TRIOLO "D"**  
**'74 Winner**  
**East Coast Championships**  
**Time: 40:06**

number of points competitors from that Zone carry into the Finals.

4. Can there be more than one full fare awarded in any Zone? Yes. If the fliers in any one Zone were all very good, and flew cross-zone a lot, and fliers from other Zones were inconsistent fliers, it is possible that fliers from one Zone could pick up all the marbles. So, get ready and hold your own!

#### CONTEST CALENDAR

##### CONNECTICUT - Glastonbury

Indoor sessions at Glastonbury High Gym; Tuesdays, 7 pm-9:30 pm, May 6, June 3, 1975; Sundays, 8 am-12:30 pm, May 11, 1975. George Armstead, 89 Harvest Lane, Glastonbury CT 06033, ph. 203-633-7836.

##### FLORIDA - Miami

Indoor Fly-in at JFK Gym, Miami Dade North College, 9 am-2 pm (confirm by calling 858-6363), May 4, 1975. Indoor contest at Goodyear Hangar, Opa Locka Airport, 10 am-6 pm, May 25, 1975. Confirm hangar date, Dr. John Martin, 3227 Darwin St., Miami FL 33133.

##### ILLINOIS - Chicago

2nd Annual Midwestern States Indoor Championships, May 17-18, 1975 at the Madison St. Armory, 2653 W. Madison St., Chicago. Paper Stick, Indoor Stick, Cabin, FAI Stick, HLG, PennyPlane, Peanut Scale, AMA Scale. CD's: George Gordy, 2901 Prairie, Brookfield IL 60513 and Buddy Equitz, 4543 N. Keystone Ave., Chicago IL 60630.

##### MARYLAND - Silver Spring

Indoor sessions at JFK High School on Randolph Rd. in Silver Spring, MD, 7 pm-11pm, April 25, May 9, 16, 30, 1975. Rolfe Gregory, 11603 Milbern Dr., Potomac MD 20854. FAI Cat. I Record Trials, National Guard Armory, 2831 East Randolph Rd., Silver Spring, Apr. 27, May 11, June 29, 1975. Tom Vallee, 444 Henryton So., Laurel MD 20810, ph. 301-498-0790.

##### NEW JERSEY - Union

Indoor sessions at Livingston School on Midland Blvd., Union NJ, on the second Thursday each month thru May, '75. Dan Domina, 47-01 Fox Run Dr., Plainsboro NJ 08536.

##### NEW JERSEY - Lakehurst

Indoor sessions at Lakehurst #5, Apr. 20, May 10, 25, July 4-5, 1975. Confirm hangar availability by calling 609-737-3522 on Thursday or Friday pm before meet.

##### NEW YORK - Long Island

LIAMAC Indoor Contest, May 4, 1975, Cantiague Park, Hicksville, L.I. NY, 8 am to 5 pm, Cat I site. AMA Stick, HLG, Easy B, Peanut Scale, AMA Scale. J. G. Paillet 30 Emerson Rd., Brookville NY 11545.

##### OHIO - Cincinnati

SWOFF 4th Annual Indoor Contest, May 4, 1975, Univ. of Cincinnati Fieldhouse, AMA Stick, Paper Stick, Peanut Scale, HLG. Don Wright, 3349 Morrison Ave., Cincinnati OH 45220.

##### OHIO - Euclid

Cleveland Free Flight Society Indoor Contest, Euclid Arena, Euclid OH, May 17-18, 1975; HLG, Indoor Stick, FAI Stick, Paper Stick, Peanut Scale, Indoor Scale, Easy B, Jetco ROG, Delta Dart, Beraps. Site has 30' ceiling and 85' x 160' floor. Contact Jim Hyka, 19411 Preston Rd., Warrensville Hts. OH 44128, ph. 475-2381 or Vern Hacker, 25599 Breckenridge, Euclid OH 44117, ph. 486-3388.

#### STATE OF THE ART

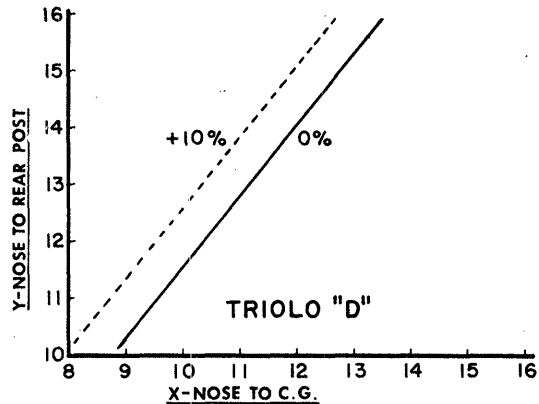
John Triolo won the 1974 East Coast Championships with his "300"; it appears on the plan page. The model is of mostly conventional design, except that it is somewhat more close-coupled than is usual for "300's". As such, it permits a more compact carrying box; the performance has certainly not suffered by such a departure from usual design practice. John's first comments were:

I consider my "D" to have very good potential for a 47 minute flight once I learn to fly it. It's only the second D I ever built so it's new ground for me. My next step is to increase prop pitch if and when I get to fly it again.

In view of the already high pitch, I questioned John about increasing prop pitch. John replied, "The model deadsticked on the 40:06 flight, and the last thing I want to do is add more rubber weight. If I add more turns with the present prop, the model will climb for more than 20 minutes and will get too high in the rafters. The present weight of rubber delivers the torque needed for using up turns, and the model doesn't sustain well with less power. By increasing pitch I can add turns (more torque to compensate for higher pitch) without going through the roof (hopefully). In other words, I adjust prop pitch to the rubber torque that gave me the best time for altitude gained (just over the catwalk with the old prop), so long

as I can add turns. Without extra turns, there is no pay-off from increasing pitch. I realize there are several approaches to this problem, but this works best for me.

Other details about the model: the weight was .058 oz. and rubber weight was approximately .062 oz., for a power to weight ratio of 1.07:1. Turns on the winning flight were 1350, giving an average RPM of 33. John flew the model at a CMOS margin of just over +9%, and the balance chart is shown below.



#### PERFORMANCE YARDSTICKS

The material presented below is intended as additional information to use with "Choice And Preparation of Indoor Rubber Motors", by Dennis Jaacks (Feb. '75 INAV).

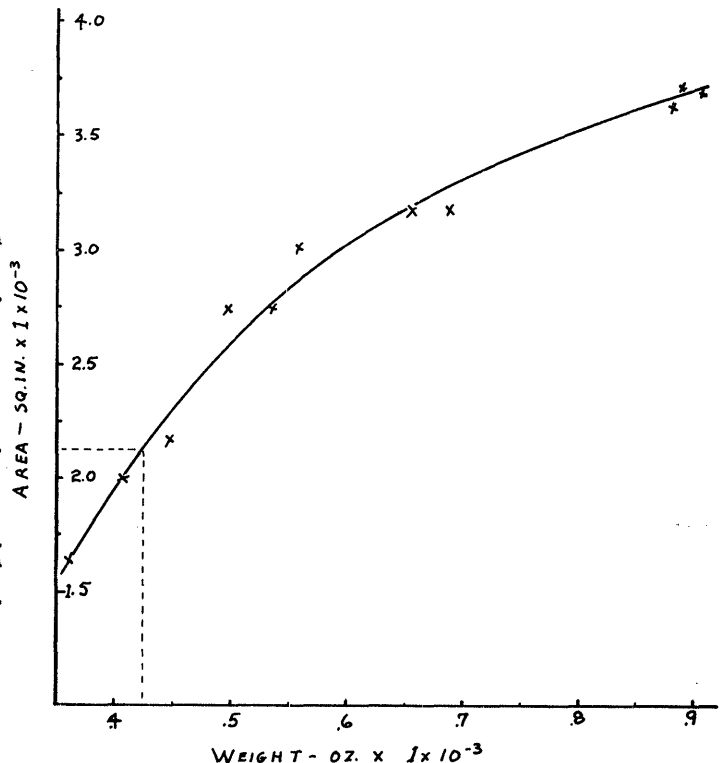
#### Appendix I

This material is reprinted from the Jun. '72 INAV, as a suggestion on handling knots other than the Richmond knot in the rubber selection method.

#### Knot Correction Chart

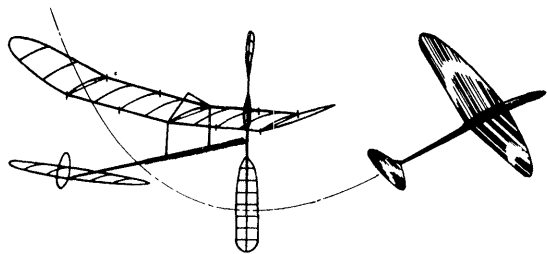
In the process of making extensive torque tests on pirelli, some method of correcting for the weight of the knot was needed. The solution to the problem was to tie many standard knots in rubber, cut them loose, then weigh the knots and average the results. The graph below gives the correction at a glance. 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 curve, 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.



# INDOOR

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



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

New Members:

DAN HERTZSON, 19 Dougal Lane, E. Northport, NY 11731  
 JOE H. HURDLE, 1400 S. Nova Rd., Apt. 229, Daytona Beach, FL 32014  
 JOSEPH N. LEWIS III, 4727 Arlington Blvd., Arlington VA 22203  
 MAX W. MARTIN, 139 S. Rena St., Arroyo Grande CA 93420  
 TOM RUTTER, Rt. 7, Box 270, Bremerton WA 98310  
 BILL SMEAD, 1494 Valencia Ave., Holly Hill FL 32017

Honorary Members

DAN POOLE, 45 Stanley Rd., Radcliffe, Manchester M26 0HG England

NFFS Top Ten Models

Erv Rodemsky's "Monster", perhaps the largest indoor model anyone has seen recently, was chosen as the indoor model in the NFFS Model Of The Year program for 1975. Plans and other details about this model and the other Top Ten models will be in 1975 NFFS Symposium Report.

'75 Nats

On behalf of the Miami Indoor Aircraft Model Association, Dr. John Martin announces that Peanut Scale and Navy Scale will be sponsored by MIAMA at the Nats. No entry fee, nice trophies thru third, and entry to be made at the same time as models are presented for AMA Scale. The same models can be used for Navy Scale as for AMA Scale, and the only requirement for the Navy Scale model is that it be a replica of some aircraft used by the Navy of any nation. Peanut Scale will use the MIAMA proposed rules - SC 76-37 is the number assigned to the proposal and it has been published in Competition News.

Nats Entry Blanks Coming

Nats entry blanks are in the mail, with entry deadline July 1, 1975 (postmark). Indoor HLG is 9 am-5 pm, and AMA Scale 5 pm-9 pm on Aug. 3, 1975. On Monday, Aug. 4, all AMA indoor rubber events run from 9 am-9 pm. The site is the same as for the 1974 Nats - the Lake Charles Civic Center Sports Arena. The open scoreboard, which caught many models last year, will be skirted to prevent models from entering. Indoor Category Championship will be computed on the basis of three declared events - the contestant's choice from Scale, Stick, Paper Stick, FAI Stick and HLG. Easy B will be included in the agenda, and is shown scheduled with the other rubber events.

It is not clear what group of people are receiving the entry blanks, but if you have not received one by June 10, and desire one, send a stamped, self-addressed envelope to AMA HQ and request one.

Nats Banquet

The Jan. '75 INAV announced that Ted Seahs and John Martin had made arrangements for Nats Indoor entrants to make reservations at the Downtowner Motor Lodge at Lake Charles - sort of an Indoor "convention". Now, John has completed arrangements for a buffet supper after the close of Indoor Rubber on Monday, Aug. 3 - 9:30 pm. Cost is to be \$3.50 per person.

Please Segregate Easy B!

Dan Domina, 4701 Fox Run Dr., Plainboro NJ 08536, has requested that Easy B models not be flown concurrently with the rest of Indoor Rubber. This is an extremely reasonable request, due to the relatively high airspeed and penetration power of the average Easy B in comparison to the average microfilm model. In other words, an Easy B can clobber a mike ship and probably sustain minimal damage. Dan has requested that all who agree with his request contact AMA HQ and support his request.

FAI INDOOR REPORT

Zone Qualification Trials

Western Zone July 4-5, 1975, Moffett Field,

North Central Zone

Aug. 16-17, 1975, Goodyear Aerospace Hangar, Akron Ohio

South Central Zone

June 15, 1975, OFE Building, Tulsa, Oklahoma

Aug. 3-4, 1975, Lake Charles, La. Civic Auditorium (Nats site)

Eastern Zone

June 21-22, 1975, Lakehurst  
 July 19-20, 1975, Lakehurst

Footnotes:

1. Trials moved to settling chamber of the wind tunnel at Moffett Field; 200' x 350' with 132' ceiling. Preliminary tests indicate good conditions. Contact Erv Rodemsky, 1624 St. David Dr., Danville CA 94526
2. All contestants and potential contestants must give their name to Bill Hulbert, 174 Castle Blvd., Akron OH 44313 well in advance of meet - security is strict!
3. Contact man - Bob Dunham, 4730 S. Yorktown Ave., Tulsa OK 74105, ph. 918-743-5424. Site has 300' x 400' floor with 65' ceiling at peak, tapering to 45' at the side, no internal supports. Site open 8 am-6 pm, six rounds beginning at 9 am, 10:30 am, noon, 1:20 pm, 2:40 pm and 4 pm with last launch at 5:20 pm. No lunch break; eating places close by. Site located on State Fair Grounds in Tulsa, total building is 1000' long and 300' wide with a portion having 35' ceiling available for testing.
4. The Civic Auditorium proved to be the only site available within the required time span. Flying of FAI Qual. Trials will be in 6 one-hour rounds between 9 pm and 12 pm on Aug. 3 and Aug. 4 (after Nats flying has finished). The alternative of using the site at any other time was rejected due to cost of rental. The stated time is already paid for. Contact Bud Tenny, Box 545, Richardson TX 75080, ph. 214-235-4035.
5. Contact for Lakehurst: John Kukon, 14 Brandon Rd., Trenton NJ 08638, ph. 609-737-3522.

Qualification Trial Results

Western Zone, May 24-25, 1975, Weight & Balance Hangar, Edwards AFB, Calif. (Time & points by round)

	1	2	3	4	5	6	Total
1. B. Randolph	11:56	19:10	22:03	10:05	23:12	21:40	
	59.32	80.70	100.0	49.96	97.34	96.23	293.57
2. E. Rodemsky	20:07	22:30	18:29	10:02	5:38	20:39	
	100.0	94.74	83.82	49.71	23.64	91.71	286.45
3. P. Allen	20:01	6:57	11:18	11:17	23:00	20:13	
	99.50	29.26	51.25	55.90	96.50	89.79	285.79
4. K. Bauer	-	-	17:35	20:11	19:46	22:31	
	0	0	79.74	100.0	82.94	100.0	282.94
5. B. Gibbs	12:57	19:02	19:47	19:02	17:50	22:07	
	64.37	80.14	89.72	94.30	74.83	98.22	282.24
6. L. Cailliau	6:43	14:28	18:47	17:17	22:11	22:18	
	33.39	60.91	85.19	85.63	93.08	99.04	277.75
7. C. Mather	9:42	23:45	9:46	14:48	23:50	9:44	
	48.22	100.0	44.29	73.33	100.0	43.23	273.33
8. G. Rambo	17:44	15:06	18:19	10:29	17:38	20:25	
	87.90	63.58	83.07	51.94	73.99	90.67	261.64
9. B. Romak	-	18:50	14:55	13:38	19:23	20:49	
	0	79.30	67.65	67.55	81.33	92.45	253.08
10. J. Magnus	13:29	12:26	5:20	15:57	11:14	13:14	
	67.03	52.35	24.19	79.03	47.13	58.77	204.83
11. F. Takagi	10:12	10:21	10:10	10:08	10:55	13:14	
	50.70	43.58	46.11	50.24	45.80	58.77	159.68

RECORDS? MAYBE!

LIAMAC Cat. I Indoor Meet, May 18, 1975, Long Beach NY

AMA Cat. I FAI - 23:48.5, Dan Domina  
 FAI Cat. II FAI - 23:48.5, Dan Domina

## CONTEST CALENDAR

### MARYLAND - Silver Spring

FAI Cat. I Record Trials, National Guard Armory, 2831 E. Randolph Rd., Silver Spring, June 29, 1975. Tom Vallee 444 Henryton So., Laurel MD 20610, ph. 301-498-0790.

### MICHIGAN - Detroit

The Detroit Indoor Model Aviation Contest will be held at the Michigan State Fair Coliseum, 9 am to 6:30 pm, June 15, 1975. Delta Dart, HLG, AMA Scale, Peanut Scale, Paper Stick, Indoor Stick. Walter Hartung, 14759 Kilbourne, Detroit, ph. 527-7620.

### NEW JERSEY - Lakehurst

Indoor sessions at Lakehurst #5, July 4-5, 1975. Confirm hangar availability by calling 609-737-3522 on Thursday or Friday pm before meet.

## NIMAS POSTAL MEET

Due to the problem last year with two or three Postal entries being misplaced until the next issue after the one announcing the results, extra care has been taken this year to keep the results together. However, if anyone "out there" sent an entry not reflected in the listing below, drop us a line immediately. Meanwhile, until the next issue, the listings below will be provisional.

Name	Time	Ceiling	Fudge	Score
<b>Junior Easy B</b>				
1. Mark Rader	227.1	23'	1.234	233.9
2. Amy Hancy	225.8	23'	1.234	232.6
3. Ray Baughman	196.1	23'	1.234	202.0
4. Susie Herr	181.5	23'	1.234	186.9
5. Chris Carroll	169.8	23'	1.234	175.0
6. Margie Minut	150.0	23'	1.234	154.5
7. Vicky Matusicky	137.0	23'	1.234	141.1
8. Teri Hartman	136.0	23'	1.234	140.0
9. David Tracy	126.0	23'	1.234	129.8
10. David Majesky	124.0	23'	1.234	127.7

Name	Time	Ceiling	Fudge	Score
<b>Open Easy B</b>				
1. Dick Hardcastle	653.0	23'	1.234	805.8
2. Bob Platt	580.6	21'	1.291	749.5
3. Clarence Mather	579.0	22.3'	1.253	725.5
4. Hal Crane	526.8	21'	1.291	679.8
5. Fudo Takagi	413.0	22.3'	1.253	517.5
6. Richard Whitten*	380.8	33'	1.03	392.2

Name	Time	Ceiling	Fudge	Score
<b>Junior PennyPlane</b>				
1. Margie Minut	160.9	23'	1.234	198.6
2. Mike Avins	125.5	23'	1.234	154.9

Name	Time	Ceiling	Fudge	Score
<b>Open PennyPlane</b>				
1. Clarence Mather	400.0	22.3'	1.253	501.2
2. Richard Whitten*	403.1	33'	1.03	415.2
3. John Magnus*	270.0	22.3'	1.253	338.3

\*Senior

Name	Time	Ceiling	Fudge	Score
<b>Junior Cat. I HLG</b>				
1. Mark Drela	43.4	18'	1.39	60.3
2. Mark Rader	39.5	23'	1.087	42.9
3. David Tracy	32.5	23'	1.087	35.3
4. Amy Hancy	30.1	23'	1.087	32.7
5. Susie Herr	29.3	23'	1.087	31.8

Name	Time	Ceiling	Fudge	Score
<b>Open Cat. I HLG</b>				
1. Dick Hardcastle	65.0	23'	1.087	70.6

## TOP TEN CEILING DODGERS

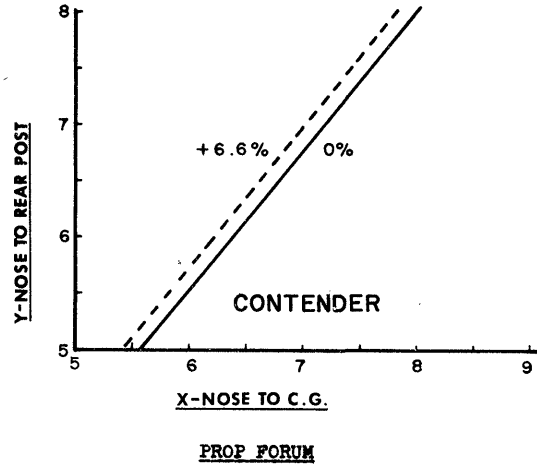
Name	Time	Ceiling	Fudge	Score
1. Stan Chilton	1115	35'	1.0	1115
2. Tom Vallee	810	20'	1.323	1071.6
3. Robert Dunham II	1454	89'	.627	911.7
4. Hal Crane	682	20'	1.323	902.3
5. Bob Dunham	1357	89'	.627	850.8
6. Dick Hardcastle	653*	23'	1.234	805.8
7. Bud Tenny	1275	89'	.627	742.9
8. Hewitt Phillips	528.2	20'	1.323	698.8
9. Howard Haupt	456	22'	1.261	575.0
10. Steve Lovens	433.2	20.5'	1.307	566.2

## STATE OF THE ART

The Cleveland Free Flight Society's newsletter "CROSS-WINDS", edited by NIMAS member Dave Fishery, does an excellent job of communicating with both their club members and with others privileged to receive the newsletter. One of the many plans carried by CROSSWINDS in recent times is reproduced on the plan page. This model, "Contender", by Larry and Tom Mzik, should be an excellent model in competition. An unusual feature of the model is sliding wing sockets, which makes the model adaptable to variable air conditions. For those who might opt for the slightly low-

er weight of fixed wing installation, the CMOS balance chart below will show where to mount the wing for good-to-average conditions. The drawing shows a wing location and a rearward CG location ".050 oz."; this trim gives a balance margin of +6.6%. A similar Easy B, "Easy '72", appeared in the Jan. '72 INAV and proved to be docile, even with a rearward CG. Don't knock it until you've tried it!

Two other design features on this model stand out; few Easy B's have polyhedral (in case the drawing doesn't reproduce, the dihedral is 7/16" at the first break and 1 1/4" at the tip), and the rudder is adjustable without bending the boom. Also, 1 1/4° negative incidence in the boom means to raise the boom about 1/4".



The Feb. '74 INAV featured an adjustable pitch prop by Jeff Annis. Jeff flew PennyPlane and FAI Indoor Stick models at the '74 Nats using adjustable pitch props, and placed in the top ten. This article presents a graphical design approach for adjustable pitch props.

## VARIABLE PITCH PROP DESIGN

by Jeff Annis

The accompanying three graphs summarize computer calculated data and are intended to simplify variable pitch prop design.

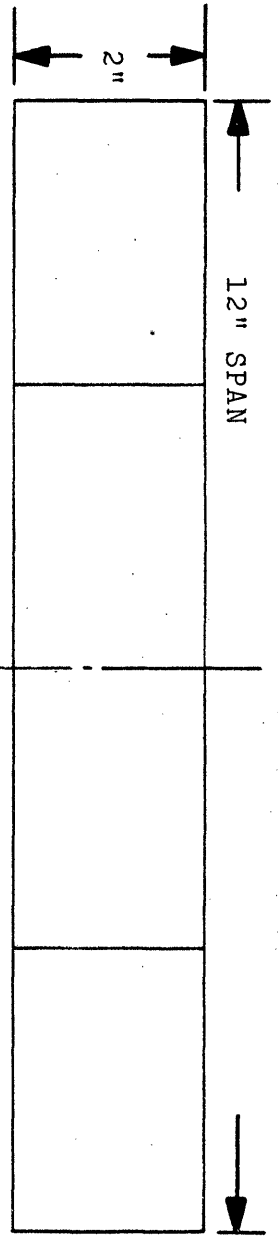
The first graph (Angular Displacement vs Pitch) is a plot showing how the mean pitch changes as a true pitch prop blade is rotated. The second graph (Angle vs Torque) applies to the parameters which can be changed on the variable pitch prop to match it to various torque ranges. Refer to the prop sketch to find "A" and "B". Computation shows that "A" has little effect on displacement, and "A" is assumed to be fixed at .5". This graph has curves with alphanumeric designations referring to the chart below. Note that the variable is "B".

Curve	Music wire dia.	Dim. B
14-A	.014"	0.88"
14-B	.014"	1.0"
14-C	.014"	1.25"
15-A	.015"	0.88"
15-B	.015"	1.0"
15-C	.015"	1.25"
16-A	.016"	0.88"
16-B	.016"	1.0"
16-C	.016"	1.25"

The third graph (Pitch vs Ref. Angle) is used to set the prop blades in the proper position once the other parameters have been chosen. As indicated on the graph, the reference angle is to be applied at 5" radius.

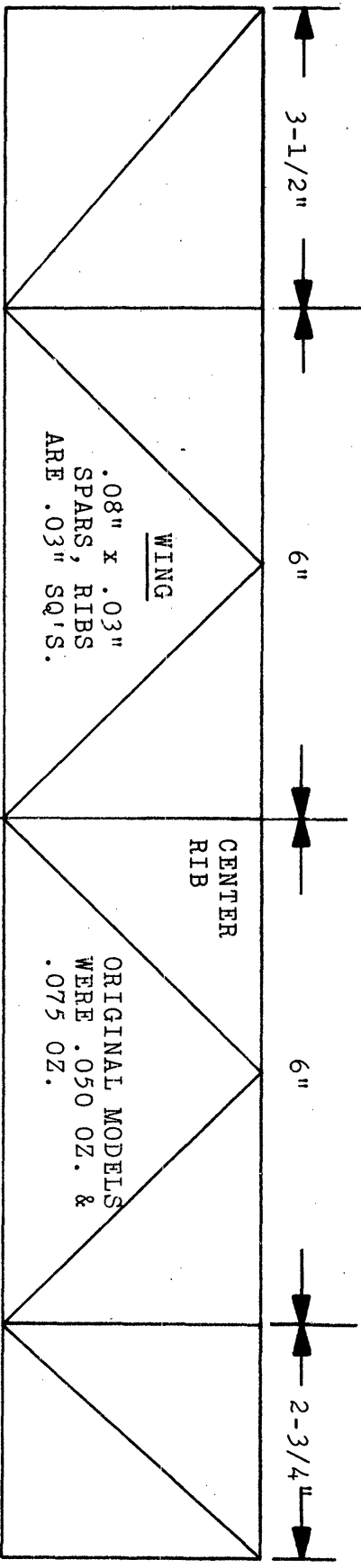
Here is an example of how to use the graphs to design the variable pitch mechanism for the conditions of torque ranging from .1 in.oz. to .5 in.oz. and pitch ranging from 20" to 45". To clarify, the problem is to find a combination where the pitch will be 20" with .1 in.oz. torque and will increase to 45" with .5 in.oz. torque.

- From graph #1 choose any stock pitch which will give the required range of 20" to 45" pitch. For this example, any of the stock pitches except 25" pitch can be used. I will choose to use 45" stock pitch. Therefore, the blades will have to be constructed on a 45" pitch block.
- From graph #1, when  $\theta = 0^\circ$ , pitch = 45". Following the 45" stock pitch line down to 20", then across to  $\theta$ , the answer is  $-20^\circ$ . Thus, the blade angle will decrease from normal by  $20^\circ$  as it covers the design range.



12" SPAN

STAB  
.030" SQ. SPARS  
AND RIBS. NO  
CENTER RIB.



3-1/2"

6"

6"

2-3/4"

WING  
.08" x .03"  
SPARS, RIBS  
ARE .03" SQ'S.

CENTER  
RIB

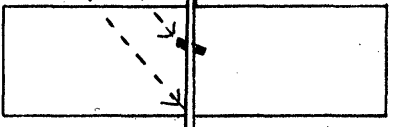
ORIGINAL MODELS  
WERE .050 OZ. &  
.075 OZ.

1-1/2" DIHED.

7/16" DIHED.

1 1/2" DIHED.

-1-1/20 TO 30  
INCIDENCE IN  
BOOM

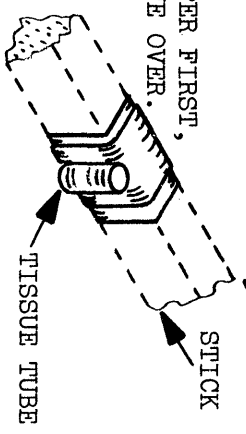


RUDDER

4" x 1-3/16",  
.030" SQ'S.

.10" x .08" >  
.030" SQ. x 8-1/4"

WRAP C-PAPER FIRST,  
THEN TISSUE OVER.  
ADD TUBE.



STICK

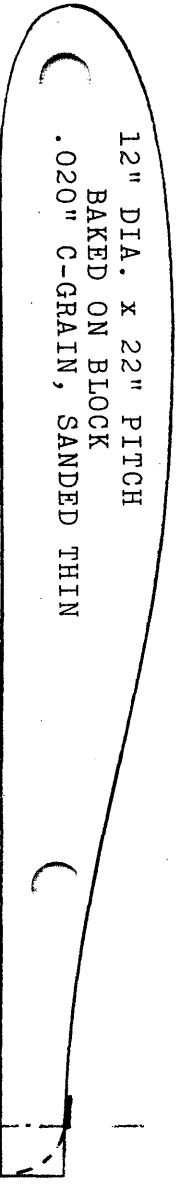
TISSUE TUBE

1/16" DIA.  
POST.  
2-1/2" LG.  
CG .050oz

SLIDING  
CG WING  
POSTS

.10" x .187" x 9" STICK

DUAL THRUST  
BEARING



FULL SIZE AIRFOIL  
FOR WING & STAB

12" DIA. x 22" PITCH  
BAKED ON BLOCK  
.020" C-GRAIN, SANDED THIN

# THE "CONTENDER"

AN EZB BY  
LARRY & TOM MZIK  
DRAWN BY DAVE PISHNERY

1/4" EXCESS FOR OVERLAP  
ALL WIRE .015" DIA.

3. Refer to graph #2. Since the angular displacement is  $20^\circ$  (from step #2), find a combination where a change in angular displacement is  $20^\circ$  for a torque change between .1 in.oz. and .5 in.oz. The closest combination is curve 16-C, 15-A. before leaving graph #2, note that at .5 in.oz., the actual angular displacement is  $23.5^\circ$ . Refer to the chart above and note that for .016" wire, "B" is 1.12" and for .015" wire, "B" is .88"; either can be used.

4. To find the reference angle used to mount the blades, remember that the total angular displacement (step #3) is  $23.5^\circ$  (when torque = 0). Refer again to graph #1 and note that when  $\theta = -23.5^\circ$ , (use the  $45^\circ$  pitch line), the mean pitch is about  $17^\circ$ .

5. Refer to graph #3; for  $17^\circ$  pitch, the reference angle is about  $27.5^\circ$ . Therefore, mount the blades at  $27.5^\circ$  (measured at  $5^\circ$  radius) when torque is 0. That's all!

### A LOOK AT YESTERYEAR

Where did postal meets come from? An article on page 27 of the Aug. '41 MAN shows that a letter from Pete Andrews caused "The Instructor" (apparently a staff writer, or else Bill Winter in masquerade) to suggest a mail or "telegraph" contest format almost identical to the postal meets of today. Even then, the basic idea was not new, but had been used in similar format not long before!

### HINTS AND KINKS

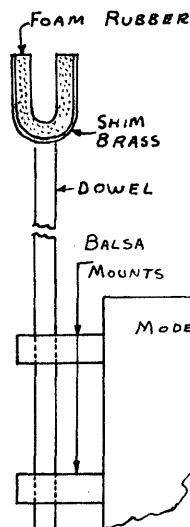
This particular column has not appeared often in the past couple of years, partly because of lack of material, and partly because many excellent ideas come in with missing or inadequate sketches, or even with really artistic sketches done in low-contrast pencil. Consequently, such sketches must be copied or enhanced in some fashion before they can be used. Quite often, there isn't time for me to do over the sketches, and even sometimes not even time for a letter requesting the author to do it.

Just to remind all you clever people out there that your ideas are welcome, the ideas below have been reprinted from earlier INAV's. Don't be so modest!

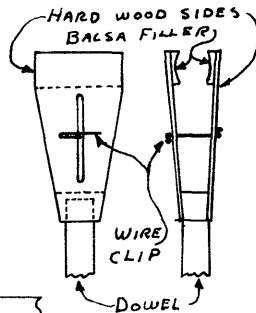
### Run-Down Stands

One of the handiest things on the flying field is a run-down stand. As the two sketches show, this is a rod or post fastened to the model box and topped off by a clamp or whatever to hold the model. Both the designs shown will hold a model firmly enough for repair or to let the motor run down, yet the model can be removed easily to hook up a wound-up motor.

#### KOWALSKI

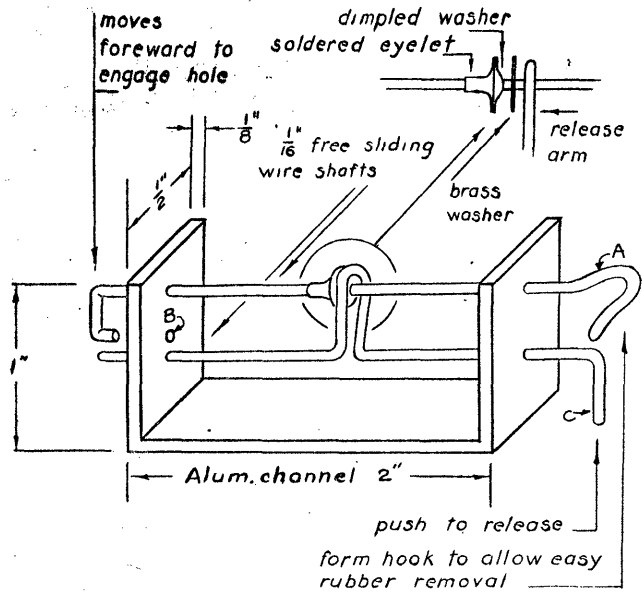


#### CUMMINGS



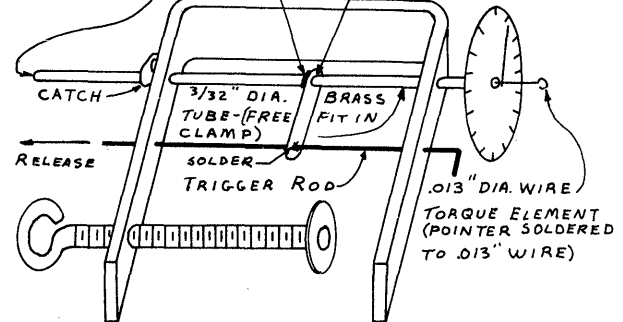
### Model Stoooges

Indoor stoooges are frequently seen in recent years, as more and more filers appreciate the advantages of winding the motor unaided. The sketch below shows the basic idea; hook "A" holds the knot end of the motor and is slid forward until the rear end locks in hole "B". After the winding is complete, dis-engage the winder from the front end of the motor, hook the motor to the prop, and grasp the prop shaft and motor firmly to prevent unwinding. Next, grasp the rear end of the motor next to the knot and use lever "C" to disengage the top shaft from hole "B". The top shaft will then spin out a few turns and leave an open loop adequate to engage the rear hook of the model.



Jim Richmond's stoooge goes two steps further; it is built into a "0" clamp, and the shaft which holds the motor is a torque meter. With these adaptations, Jim can more easily mount the stoooge, and can wind up on a torque meter. Both Jim's stoooge, and the one above, can be used to run out unused turns at the end of a flight. Also, Jim can lock the shaft, hook up the motor after a flight, and check how much torque is left over after the flight.

.013" TORQUE WIRE WASHER SOLDERED TO 3/32" TUBE ANCHORED TO REAR OF 3/32" TUBE FREE FIT ON 3/32" TUBE



### INDOOR ELSEWHERE

The Argentine National Indoor Contest was held April 13, 1974 in a drafty cinema which had a 9 meter ceiling. The location was Rafaela Town in Santa Fe Province.

Rank	Name	Time 1	Time 2	Time 3
1.	Eduardo Grippo	8:59	11:43	20:42
2.	Nereo Beggiato	9:29	9:55	19:24
3.	Miguel Leone	9:51	9:22	19:13
4.	Alberto Barilari	8:47	10:12	18:59

Polish National Indoor Contest, held at the 44 meter site in Wroclaw on June 13-16, 1974:

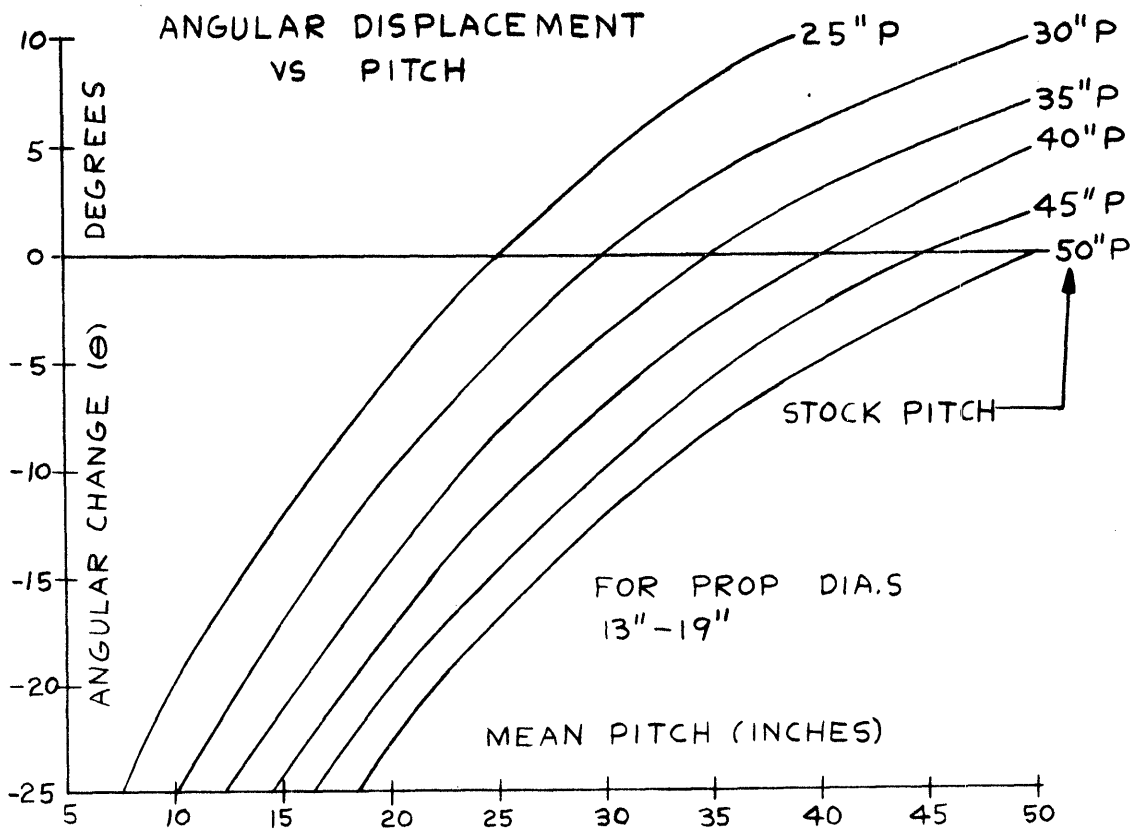
#### Juniors

Rank	Name	City	Time 1	Time 2	Time 3
1.	F. Pawel	Wroclaw	20:02	22:21	42:23
2.	G. Stanislaw	Krakow	19:35	21:04	40:39
3.	S. Zdzislaw	Wroclaw	19:10	20:43	39:55
4.	W. Maciej	Bydgoszcz	20:52	17:23	38:15
5.	Z. Jan	Wroclaw	19:00	18:44	37:44
6.	J. Dariusz	Wroclaw	17:43	16:55	34:38
7.	L. Jacek	Bydgoszcz	15:27	16:22	31:49
8.	J. Janusz	Bydgoszcz	12:53	17:09	30:02
9.	P. Wlodzimierz	Bydgoszcz	15:02	12:37	27:39
10.	D. Jaroslaw	Bydgoszcz	5:00	5:25	10:25

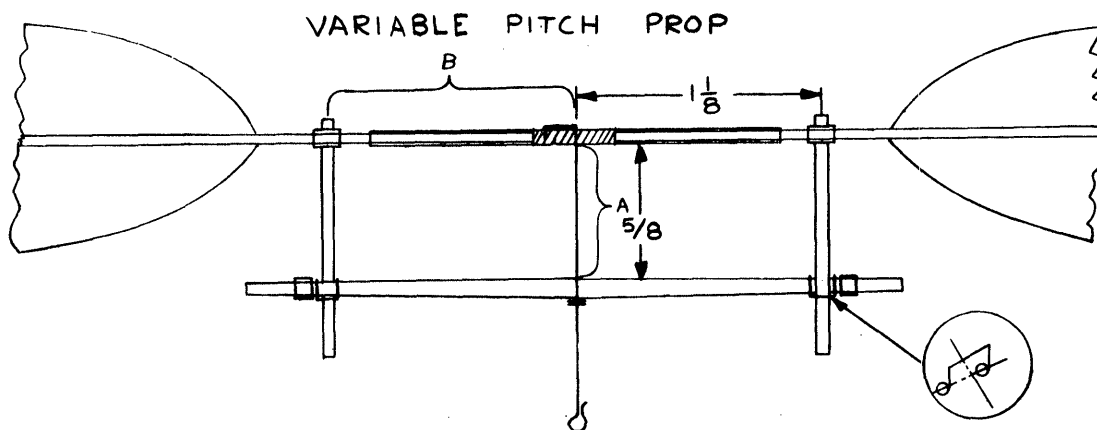
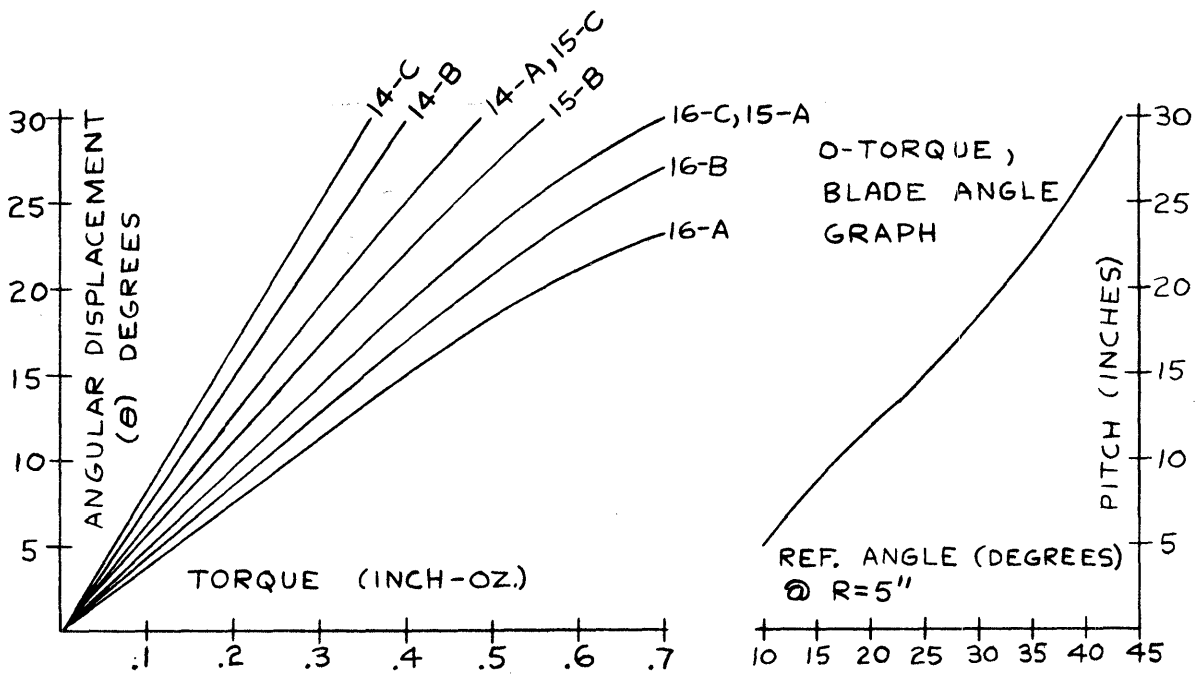
#### Open

Rank	Name	City	Time 1	Time 2	Time 3
1.	E. Ciapala	Slask	29:35	29:29	59:04
2.	R. Czechowski	Krakow	29:03	27:52	56:55
3.	S. Kujawa	Poznan	24:30	27:54	52:24
4.	S. Bombol	Wroclaw	25:22	26:52	52:14
5.	S. Slewko	Bydgoszcz	24:37	23:02	47:39
6.	Z. Szymanski	Wroclaw	23:36	22:02	45:38
7.	B. Peretykiewicz	Ziel. Gora	21:48	20:54	42:42
8.	J. Nawrocki	Wroclaw	19:04	23:31	42:35
9.	I. Pudelko	Krakow	15:29	20:56	35:25
10.	K. Muchowski	Ziel. Gora	15:44	15:55	31:39
11.	S. Rozycska	Wroclaw	15:26	15:02	30:28
12.	J. Kapusniak	Bydgoszcz	12:34	17:24	29:58
13.	L. Kuzniak	Bydgoszcz	11:12	17:43	27:57
14.	G. Deczkow	Bulgaria	10:19	7:42	18:01
15.	N. P. Nikolov	Bulgaria	4:24	8:16	12:40





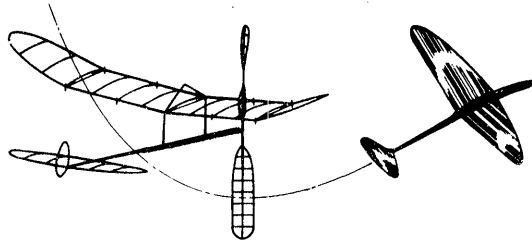
ANGLE ( $\theta$ ) vs TORQUE



# INDOOR

## NEWS and VIEWS

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



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

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Honorary Members

GEOFFREY LEFEVER, Delft Cottage, Guestwick, Dereham, Norfolk, England

NIMAS Postal Meet

The results from the 1975 NIMAS Postal, printed in the Apr/May '75 INAV, were declared provisional due to the possibility of some results being misplaced in the chaotic NIMAS office. Now that no one claims to be left out, the published results are declared official.

NIMAS International?

Dear Bud:

During the time of the June 7th and 8th North Central FAI Indoor Regionals at the Pompeian Court in West Bend, Indiana, I had the opportunity to visit at great length with Mr. Ray Semmons, Director of Student Personnel at Northwood Institute. Mr. Semmons informed me that Northwood would be very happy to allow us the use of their facilities for any other indoor meets that we desired either this year or next year; and that as long as he, Mr. Semmons, was at the Institute we would always be welcome.

The hospitality shown us by the Northwood Institute - and Mr. Semmons in particular - was far above what was expected and it appeared that Mr. Semmons was going "all out" to roll out the red carpet treatment for us. As long as I can remember, Indoor Fliers have never had such an opportunity as presented at Northwood Institute. The Northwood Institute even ran Xerox copies of our results of the Regionals within minutes of the close of our contest -- this type of enthusiasm and hospitality and cooperation comes along sometimes just once in a lifetime. To this add the availability of low cost lodging and on-site food service (the cost approximately \$8 per day for both.)

You may be busy flying all the rest of the summer; but I feel that now is the time to start seriously thinking of holding a "NIMAS International" Meet at West Baden, Indiana at the Northwood Institute sometime next June or July, 1976. I envision a prestigious indoor championships with emphasis on the social aspects, all in the setting of the historic site and surroundings.

Wives of contestants could be encouraged to attend. With such scenery and historic points and quaint shops in the area, I am sure they would have a good time. The French Lick Sheraton, (one mile away) works closely with Northwood Institute and could furnish facilities for wives' use such as swimming, horseback riding, tennis, etc.

Because there would be many that would travel a great distance to attend the "NIMAS International", I would like to see a three-day meet with perhaps record trials on Friday, microfilm covered models on Saturday, paper covered models on Sunday. With the record trials on Friday, we could have a more relaxed style competition on Saturday and Sunday; perhaps with special awards for original designs, etc. rather than awards only for total time.

By arriving at the site early we could get a cherry-picker inside the atrium and cut down all the strings and loose wires in the girders and put an inverted ice cream cone of sheet plastic over over the inverted mushroom. By doing these two things we could eliminate perhaps 75% of the total hang-ups.

I suggest that those of you who are interested in promoting such a "NIMAS International" Meet at West Baden next year correspond with me and with other interested modelers. Let's see if we can form a steering committee to formulate plans and ideas for this contest.

I guess the smell of the morning-glories each evening as we came out the back door from flying just got to me.

(signed) Stan Chilton  
 1401-A S, Hydraulic  
 Wichita KS 67211  
 316-265-7153 or  
 316-262-4181

Become An Author

Most INAV readers are aware that AMA is now publishing MODEL AVIATION, which is now being sent to AMA members as a membership benefit instead of AAM, which went bankrupt earlier in the year. Mr. Bill Winter, perhaps the most accomplished aviation editor of all time, is editor of MA. AMA is soliciting a wide variety of model designs for publication in MA. Anyone interested should send a brief description and picture of the model or project to AMA Hq. If the material fits their requirements and does not overlap material on hand, you will be given requirement for the article. Payment will be made within 30 days for all accepted projects, at very fair rates.

FAI INDOOR REPORT

Zone Qualification Trials

- North Central Zone Aug. 16-17, 1975, Goodyear Aerospace Hangar, Akron, Ohio<sub>1</sub>
- South Central Zone Aug. 3-4, 1975, Lake Charles, La. Civic Auditorium (Nats site)<sub>2</sub>
- Eastern Zone July 19-20, 1975, Lakehurst<sub>3</sub>

Footnotes:

1. All contestants and potential contestants must give their names to Bill Hulbert, 174 Castle Blvd., Akron OH 44313 well in advance of the meet - security is strict!
2. Flying of FAI Qual Trials will be in six one-hour rounds; three rounds between 9 pm and 12 pm Aug. 3, and three rounds between 9 pm and 12 pm Aug. 4, 1975. Contact Bud Tenny, Box 545, Richardson TX 75080, ph. 214-235-4035.
3. Contact for Lakehurst: John Kukon, 14 Brandon Rd., Trenton NJ 08638, ph. 609-737-3522.

Qualification Trial Results

North Central Zone, June 7-8, 1975, West Baden, Indiana Pompeian Court, Northwood Institute

1. B. Servaites	4:42	28:40	26:37	32:21	30:40		
1. B. Servaites	4:42	28:40	26:37	32:21	30:40	-	Total
	16.78	100.0	88.87	100.0	100.0	0	300.0
2. A. Rohrbaugh	15:59	25:21	7:08	10:30	29:40	29:26	
	57.05	88.43	23.82	32.46	96.74	100.0	285.17
3. R. Kowalski	25:25	25:46	29:57	19:15	7:35	0:46	
	90.72	89.88	100.0	59.51	24.73	2.60	280.60
4. R. Hardcastle	26:41	10:49	24:24	19:48	25:08	29:05*	
	95.24	37.73	81.47	61.21	81.96	98.81	276.01
5. E. Rodensky	28:01	9:05	28:13	21:57	10:49	23:08	
	100.0	31.69	94.21	67.85	35.27	78.60	272.81
6. R. Champine	5:04	27:32	25:23	13:39	21:31	25:07	
	18.08	96.05	84.75	42.19	70.16	85.33	266.13
7. R. Ganser	22:33	27:21	23:31	25:42	26:20	10:04	
	80.49	95.41	78.52	79.44	85.87	34.20	261.77
8. J. Richmond	8:43	28:33	22:12	21:50	10:28	23:27	
	31.11	99.59	74.12	67.49	34.13	79.67	253.38

9. P. Tryon	22:26	27:55	22:21	19:20	21:39	20:13	
	80.07	97.38	74.62	59.76	70.60	68.69	252.07
10. H. Crane	24:47	22:55	24:01	9:14	18:00	19:40	
	88.46	79.94	80.19	28.54	58.70	66.82	248.59
11. H. Brodersen	24:58	25:16	16:16	22:55	12:15	18:10	
	89.11	88.14	54.31	70.84	39.95	61.72	248.09
12. E. Stoll	18:51	4:01	24:24	7:59	28:25	13:34	
	67.28	14.01	81.47	24.68	92.66	46.09	241.41
13. S. Brown	24:27	22:45	22:11	18:12	7:09	16:46	
	87.27	79.36	74.07	56.26	23.32	56.96	240.70
14. W. Shailor	9:35	21:38	22:39	24:46	7:43	-	
	34.21	75.47	75.63	76.56	25.16	0	227.66
15. R. Doig	19:06	22:46	21:32	14:52	23:02	5:00	
	68.17	79.42	71.90	45.96	75.11	16.99	226.43
16. S. Chilton	21:52	25:38	10:30	17:03	6:55	-	
	78.05	89.42	35.06	52.70	22.55	0	220.17
17. R. Obarski	21:16	22:20	10:22	20:32	2:42	-	
	75.91	77.91	34.61	63.47	8.80	0	217.29
18. K. Gordey	17:59	18:52	5:23	17:39	14:21	20:40	
	64.19	65.81	17.97	54.56	46.79	70.22	200.22
19. R. Plotzke	11:19	7:29	14:50	16:47	23:54	5:20	
	40.39	26.10	49.53	51.88	77.93	18.12	179.34
20. H. Haupt	17:16	15:20	14:45	12:55	17:03	-	
	61.63	53.49	49.25	39.93	55.60	0	170.78
21. K. Johnson	12:36	5:47	14:32	-	-	-	
	44.97	20.17	48.53	-	-	-	113.67

South Central Zone - June 15, 1975, Tulsa, Oklahoma  
O.P.E. Building, State Fair Grounds, Tulsa

	1	2	3	4	5	6	Total
1. J. Richmond	19:11	23:36	26:20	9:13	24:44	-	
	97.62	100.0	100.0	40.9	100.0	0	300.0
2. R. Hardcastle	19:39	14:04	18:23	22:32	11:20	21:09	
	100.0	59.60	69.80	100.0	45.82	93.79	293.79
3. S. Chilton	18:50	5:37	24:14	21:22	14:31	22:33	
	95.85	23.80	92.02	94.83	58.69	100.0	290.69
4. R. Dunham	16:16	18:45	5:26	17:30	15:52	16:46	
	82.78	79.44	20.63	77.66	64.15	74.32	239.88
5. P. Tryon	12:34	13:02	15:35	16:59	7:07	20:08	
	63.95	55.22	59.17	75.37	28.78	89.28	228.60
6. E. Rodemsky	17:39	12:12	18:01	4:01	-	-	
	89.82	51.69	68.42	17.83	0	0	209.93
7. L. Cailliau	11:26	18:44	18:55	9:27	-	-	
	58.18	79.37	71.83	41.94	0	0	209.38
8. B. Tenny	5:03	4:50	16:16	13:09	16:13	12:00	
	25.69	20.48	61.77	58.36	65.57	53.21	185.70
9. J. Shepherd	10:03	6:10	4:55	5:22	-	-	
	51.14	26.12	18.67	23.82	0	0	110.08
10. R. Roberti	0	0	0	2:49	-	-	
	0	0	0	10.69	0	0	10.69

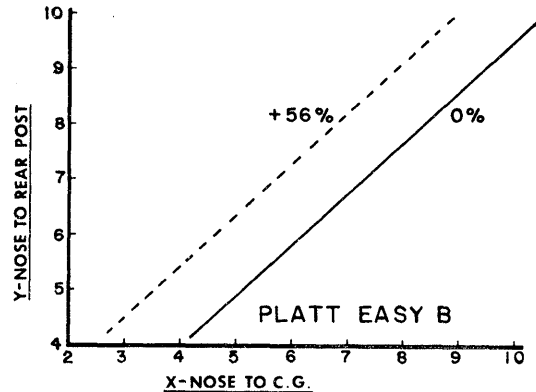
Eastern Zone, June 20-21, 1975, Lakehurst, New Jersey

	1	2	3	4	5	6	Total
1. R. Harlan	39:20	36:18	32:12	32:45	38:09	36:57	
	100.0	100.0	87.98	98.40	100.0	100.0	300.0
2. S. Cannizzo	32:00	35:51	34:11	31:02	31:26	34:16	
	81.36	98.76	93.40	93.24	82.39	92.74	285.40
3. D. Kowalski	33:56	35:12	36:36	-	32:42	21:54	
	86.27	96.97	100.0	0	85.71	59.27	283.24
4. J. Kukon	32:41	33:33	11:03	14:36	35:37	28:52	
	83.09	92.42	30.19	43.87	93.36	78.12	268.87
5. J. Richmond	34:23	31:04	34:50	25:55	30:56	24:49	
	87.42	85.58	95.17	77.87	81.08	67.16	268.17
6. J. Triolo	28:39	30:30	26:53	28:24	33:08	35:00	
	72.84	84.02	73.45	85.33	86.85	94.72	266.90
7. P. Andrews	32:05	32:40	33:54	25:25	31:13	30:28	
	81.57	89.99	92.62	76.36	81.83	82.45	265.06
8. R. Platt	33:16	9:54	30:50	30:15	30:59	9:09	
	84.58	27.27	84.24	90.89	81.21	24.76	259.71

9. R. Champine	31:09	30:27	25:39	27:07	32:17	32:26	
	79.19	83.88	70.08	81.47	84.62	87.78	256.28
10. D. Domina	9:46	8:56	28:27	33:17	22:47	24:53	
	24.83	24.61	77.73	100.0	59.72	67.34	245.07
11. W. Hulbert	19:20	29:34	29:03	25:13	28:02	30:43	
	49.15	81.45	79.37	75.76	73.47	83.13	243.95
12. R. Whitten	8:14	29:29	28:32	25:34	26:45	25:00	
	20.92	81.22	77.96	76.82	70.12	67.66	236.12
13. E. Stoll	28:16	10:00	29:58	17:06	30:33	24:28	
	71.86	27.55	81.88	51.38	80.08	66.22	233.82
14. H. Crane	26:32	22:48	28:55	25:34	29:05	22:18	
	62.46	62.81	79.01	76.82	76.23	60.35	232.06
15. W. Tyler	15:51	22:04	8:51	22:38	25:57	31:31	
	40.30	60.79	24.18	68.00	68.02	85.30	221.32
16. E. Radoff	13:10	29:07	5:58	17:37	22:21	29:50	
	33.47	80.21	16.30	52.93	58.58	80.74	219.53
17. C. V. Russo	8:40	18:01	15:15	21:04	26:24	31:46	
	22.03	49.63	41.67	63.29	69.20	85.97	218.46
18. D. Belleff	22:40	22:37	18:18	24:17	24:55	26:19	
	57.63	62.30	50.00	72.96	65.31	71.22	209.49
19. T. Vallee	23:15	0:27	25:07	22:23	14:23	25:02	
	59.11	1.23	25.07	67.25	37.70	67.75	203.62
20. E. Whitten	9:25	21:02	23:12	4:39	23:29	19:56	
	23.90	57.94	63.39	13.97	61.56	53.95	182.89
21. R. Williams	10:32	15:39	5:09	21:03	23:26	25:30	
	26.78	43.11	14.07	63.24	61.42	69.01	163.67
22. T. Cronburg	15:19	-	-	5:00	8:02	-	
	38.94	0	0	15.02	21.06	-	75.02

STATE OF THE ART

Bob Platt's Easy B finished the year 1974 at the top of the Easy B Top Ten and currently is in second place. In Hampton, Va., where Bob lives, the sites are small and somewhat difficult. This implies that the design and flying skill of Bob Platt is quite good, and the model is a good choice. The CMOS graph below is shown with both 0% and +56% - Bob's trim was quite far forward! Note also the "can" on the fuselage - newcomers to the sport like your editor have seldom seen a "can" used. However, thanks to the efforts of various NIMAS historians, we find that the "can" is a wire loop which restrains the rubber motor somewhat and minimizes motor stick deflection due to tightly wound motors.



INDOOR CONSTRUCTION TECHNIQUES

Now that Easy B seems to be a regular event at the Nats, it is particularly timely that this article became available recently. Make it available to beginners!

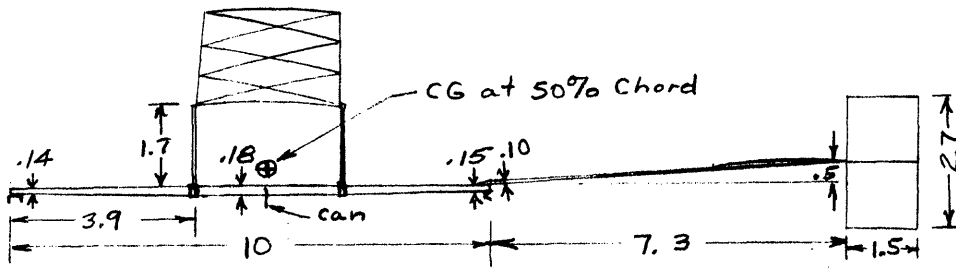
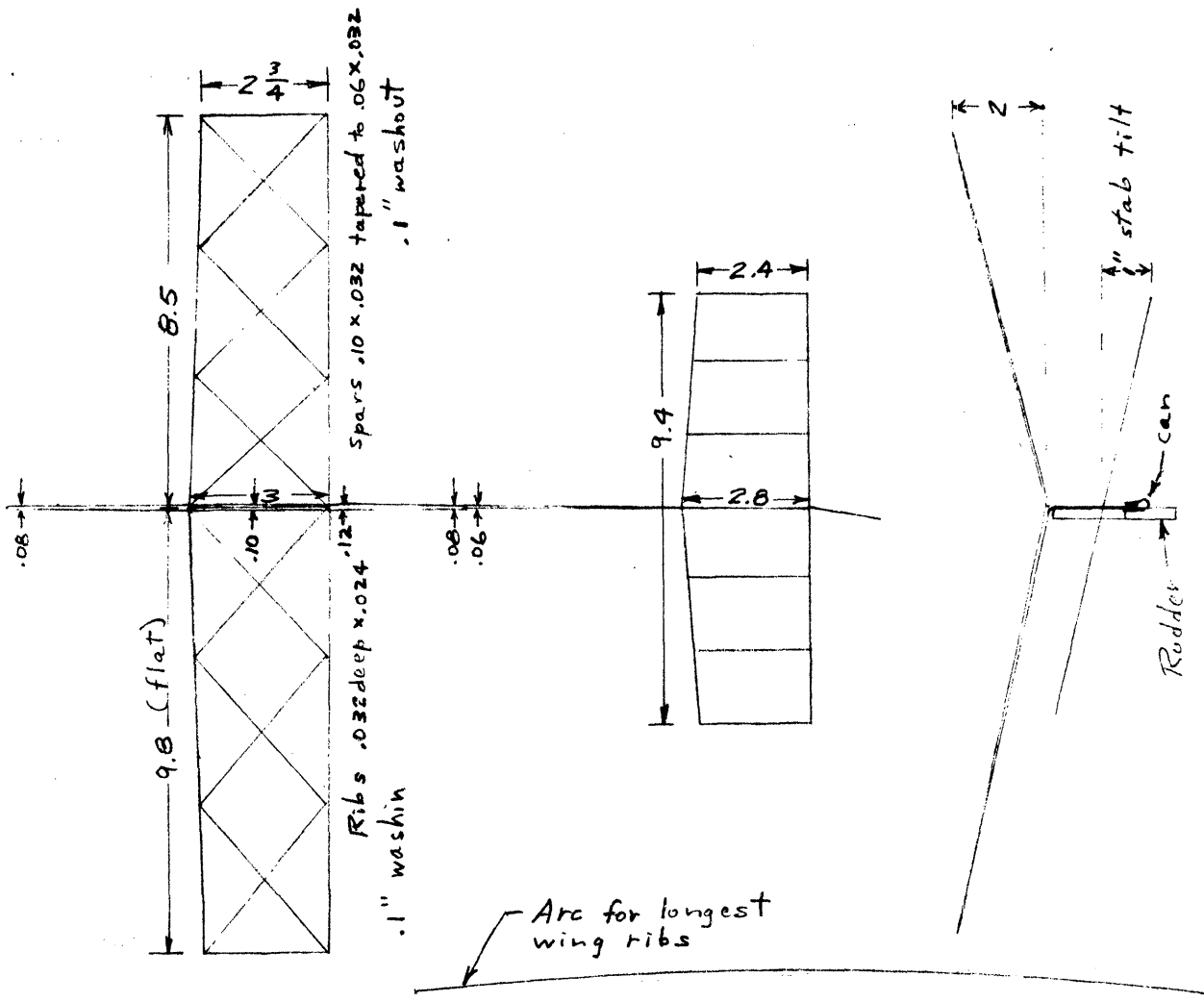
BUILDING WOOD INDOOR PROPELLERS

by Ray Harlan

The biggest bottleneck for a novice indoor builder is constructing a good propeller. This paper is written to illustrate some of the techniques and to emphasize the critical factors in making an efficient propeller.

Theory

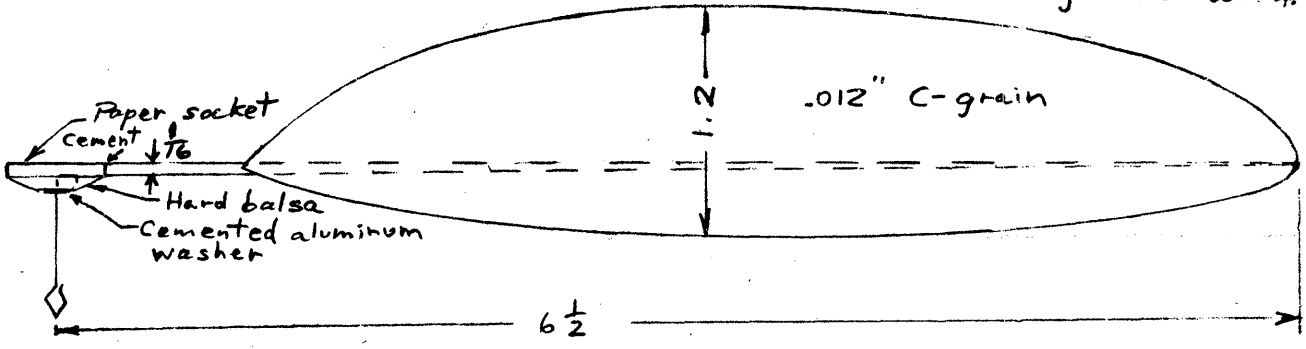
Most propellers are intended to have "true pitch"; that is, excluding any slippage, all blade elements would travel the same distance forward in one turn so that no portions of the blade fight one another. The geometry of



Wing .014 oz.  
 Stick+tail .017  
 Prop .010  
 Total .041 oz.

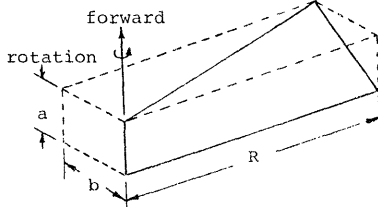
Rubber .069 x .042 x 14 1/2  
 Balsa 4 1/2 - 5 lb. stock  
 (except prop hub)

Blade angle 45° at 4.9" radius



Easy B Bob Platt  
 11-10-74

such a blade is very simple. The blade lies on the twisted surface shown below:



A form on which to build the propeller can be made from a rectangular block of length R, width b and height a. The formula for the pitch is:

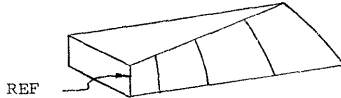
$$P = \frac{2Ra}{b}$$

As an example of using this formula, we can find the ratio b/a for a given pitch to diameter (P/2R) ratio. For a P/D of 2, b/a = 1.57. Indoor propellers usually have P/D ranging between 1.5 and 2.0. If P/d is made too large, the model is easily upset by disturbances in the air.

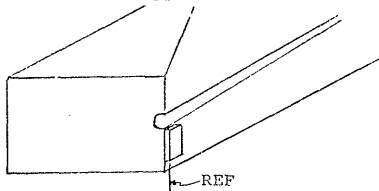
#### Block

Choosing a or b is simply a matter of making it large enough so that the blade fits within the surface shown above. A simple rule of thumb is to make b at least  $4c_m/3$ , where  $c_m$  is the maximum blade width. The a can be computed from the formula given above.

The block should be carved with a little camber in the twisted surface. Five or six percent of the chord is plenty. Keep the percentage constant over the whole blade area. The block should be shaped as shown below.



The line marked REF above is the basic reference line for the propeller. The shaft must be exactly parallel to it in order to build the intended pitch in each blade. Because the spar is thickest at the hub and may not be tapered perfectly straight, it is necessary to cut a groove in the block in which to set the spar, and perhaps even to glue a small balsa plate on the face of the block to support the shaft when assembling the propeller. Cut the groove deep enough to completely submerge the spar. The groove and plate would appear as shown below.



Remember, the block is fixed in pitch, but any size propeller, within the limit of the block, can be built on it.

#### Blades

The blade thickness depends upon the size and weight of the model. As examples, for Easy B's, they can be about .015" thick; for PennyPlanes, about .025" is more appropriate. Cut them from fully quarter grained stock of about 5 lb/ou.ft. density.

The shape depends upon the ceiling height. For low ceilings, some flare is desirable and the leading edge can be well ahead of the spar. For high ceilings the spar should be near the mid-chord. The blades should be widest at about 2/3 of R. Appropriate values for this width are 1" for Easy B and 1 1/2" for PennyPlane. There should be very little area near the hub and the blades should terminate at least 1/2" from the hub.

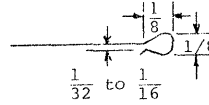
Soak the blades in hot water for about 10 minutes, place together so they match, and place in the proper position on the form, with the tips at the full radius. Wrap firmly with a 1" to 2" width strip of bedsheet and bake in a 250° oven for about 15 minutes. Let it cool, remove the strip and carefully pry the blades from the block and apart from each other with a knife. They will maintain their shape for years.

#### Spar

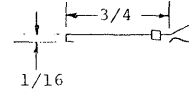
The spar carries the full load on the propeller and must be strong but light. It should be cut from 6 to 7 lb/ou.ft. density stock and tapered from the hub. For Easy B the size should be about .06" square tapered to .03" square; for PennyPlane, .08" square to .03" square should work. The spar need not extend the full propel-

ler diameter; however it should be at least 2/3 of the diameter. When tapering, cut the spar oversize in length, as the end always sands away faster than the rest of the wood. Carefully sand straight tapers with 320 grit paper, finishing with 400. Both halves should have equal flexure under load.

The shaft should be bent from .014" to .016" music wire. The hook should appear as shown below.



Sharpen the other end of the shaft and push it through the center of the spar. Pull it through up to the hook and bend it 90° 3/4" from the hook and in the plane of the hook. Then bend it again 1/16" from the last bend so it appears as below. Cut off all but 1/32" of the turned-



back end, apply glue to this square "U" and slide the spar into it. Don't let the end of the "U" pierce the spar, but rather, twist the hook clockwise lightly (as the wound motor would try to do) until the free leg of the "U" rests against the spar. Add a little more glue over the wire and just a bit where the shaft exits the spar. Make sure the shaft is perpendicular to the spar and let it dry.

#### Assembly

Lay the spar in the groove on the block and hold the shaft against the reference line with pins or tape. Spread a thin line of glue along the spar where the blade is to be joined. Place the blade in position, making sure it rests firmly on the block. When dry, remove the propeller, rotate it and repeat the steps to complete the assembly. For indoor models, weight balance of the two sides of the prop is not nearly so important as matching the pitch of the two blades.

#### HINTS AND KINKS

The ideas below are more reprints from earlier INAV's. This column is still open for more ideas from "out there"; please furnish high contrast sketches if possible.

#### Slick Tissue Sockets

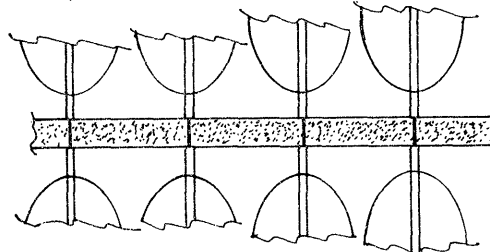
Dick Ganslen suggests that teflon tubing can be used as a no-stick form to roll wing sockets on. Just slip the tubing over thin wire to hold it stiff, and roll the sockets as usual. It is not necessary to remove the sockets before the glue is dry, as the teflon is slick enough to allow the finished socket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

#### Wing Reinforcement

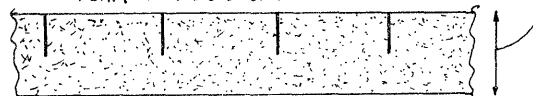
Bob Platt reinforces his FAI wings with a length of monofilament dacron glued to the leading edge and trailing edges of the wing where the steering pole makes contact. This is intended to hold the wing together if it breaks, thus preventing the film from tearing. Similarly, Bob Randolph puts dacron across the top of the dihedral joint area before installing the dihedral. If the spar should break while he installs the dihedral, the film won't tear. In either case, the film must be dry enough to not stick and tear as it folds over.

#### Prop Storage

At the 1966 WCh, Hans Beck carried all his props in a briefcase-style wooden box. Inside, each wing of the box carried a wide strip of foam rubber slotted to hold props as shown below. This is excellent packing; the props are shock mounted firmly, yet easily removed. Unlike some similar arrangements, careless handling of the props has to be really rough before props are damaged.



FOAM MUST BE DEEP ENOUGH FOR PROP TO CLEAR



# INDOOR

## NEWS and VIEWS

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

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

### New Members!

H. R. SANDERS, 9009 Alton Pkwy., Silver Spring MD 20910  
LARRY L. VANCE, 5096 Morris, Las Vegas NV 89120  
CARL WILSON, 720 N. Merrill, Apt. 220, Duncanville TX  
75116

### Attention All Northeastern Flyers

Some of the guys in the Northeast are trying to get a little more cooperation among the clubs there by publishing a new newsletter, FLASHBACK, with all contest results, contest photos and comments.

This is a cooperative effort, meaning.... CD's send in results, completely typed ready to Xerox, preferably. Subscriptions are only available by sending in as many self-addressed and 10¢ stamped envelopes as you want. Subscription runs out with the last envelope. No charge for subscriptions....just you do the work of addressing.

Send typed contest results, photos, commentary...and those envelopes...to Ed Whitten, Box 176, Wall Street Station, New York NY 10005.

(Ed. note) Ed's first two issues are exactly what he promised - and seem to be an excellent mode of communication for contest flyers. I recommend the newsletter!

### All Right! Let's Move

In the June '75 INAV Stan Chilton proposed a new and very significant contest - a NIMAS "Internats" - to be held at the Pompeian Court of Northwood Institute in West Baden, Indiana sometime in June or July, 1976. He asked for letters of support and comment from all who are interested, with copies to Bud Tenny.

Already, there have been significant numbers of letters from places close to and far from the proposed site. All have been enthusiastically supportive, and no doubt there are many more who like the idea.

So, what goes next? Obviously, we need ideas to build on Stan's original dream. We need people willing to do a lot of work, and to commit themselves to attend and participate. Maybe we even need people 'way out west and east to help arrange some sort of cooperative transportation. Who knows what all is needed? We won't, until the ideas come in! One thing I think - we need this contest! For years, NIMAS has been held together mostly by virtue of INAV, with some contact and camaraderie sponsored by postal meets and informal competitions. The only face-to-face NIMAS meeting took place at the '62 Nats, and that was mostly a business meeting. It was jammed into the very busy Nats meeting schedule, with no real opportunity for social activity or just plain bull sessions.

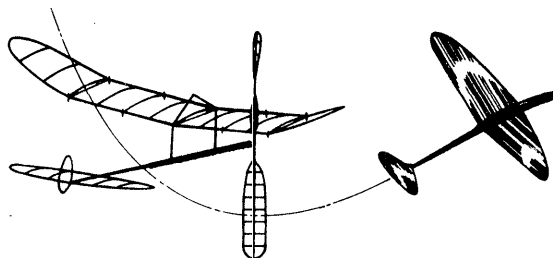
Picture this, if you will: a totally self-contained indoor site, food and lodging almost within arm's reach. If the site isn't the world's best, it is much better than average. Stan's proposal to "clean up" the ceiling will measurably improve the site. Best of all, we would have three days of leisurely (or maybe fierce) competition, in surroundings very conducive to friendship. In such an atmosphere, NIMAS membership and friendship will take on a new meaning. From a purely personal standpoint, I will place a high priority on this unprecedented opportunity!

### Salute Our CD's!

Thanks to CD's and newsletter editors and interested flyers, there is a large backlog on contest results on hand. In reviewing this material, it occurred to me that we (indoor flyers) owe our CD's a vote of thanks for their hard work which often begins with the task of finding a site for us to fly. So, this issue is dedicated to indoor CD's, and much of the issue will be reports of these many competitions they held for us.

### NIMAS Awards

Rubber Cat. II Diamond Award - 43:58, Paul Allen



### FAI INDOOR REPORT

#### Zone Qualification Trials

North Central Zone Aug. 16-17, 1975, Goodyear Aerospace Hangar, Akron, Ohio

South Central Zone Aug. 3-4, 1975, Lake Charles, La. Civic Auditorium (Nats site)<sup>2</sup>

#### Footnotes:

- All contestants and potential contestants must give their names to Bill Hulbert, 174 Castle Blvd., Akron OH 44313 well in advance of the meet - security is strict!
- Flying of FAI Qual Trials will be in six one-hour rounds; three rounds between 9 am and 12 pm Aug. 3, and three rounds between 9 pm and 12 pm Aug. 4, 1975. Contact Bud Tenny, Box 545, Richardson TX 75080, ph. 214-235-4035.

#### Qualification Trial Results

Western Zone, July 5-6, 1975, Moffett Field, California

	1	2	3	4	5	6	Total
1. Bud Romak	30:05 99.89	19:12 57.60	34:58 100.0	27:16 97.50	32:11 100.0	23:34 73.57	299.89
2. Bob Gibbs	29:59 99.56	26:38 79.90	30:53 88.32	27:38 98.81	26:17 81.67	13:39 46.21	286.69
3. Bob Randolph	30:07 100.0	33:20 100.0	27:31 78.69	13:33 48.45	25:38 79.65	27:45 86.63	286.63
4. Erv Rodemsky	14:45 48.98	16:53 50.65	14:31 41.51	26:46 95.71	22:51 71.0	32:01 100.0	266.71
5. C. Mather	24:31 81.41	27:30 82.50	13:50 34.56	27:58 100.0	25:25 78.97	20:24 63.68	263.91
6. L. Cailliau	10:15 34.03	27:58 83.90	22:20 63.87	15:00 53.64	26:03 80.94	30:10 94.17	259.01
7. Paul Allen	23:51 79.19	26:47 80.35	28:06 80.36	9:54 35.40	25:10 78.20	27:26 85.64	246.35
8. John Magnus	24:37 81.74	28:02 84.10	12:27 35.60	16:00 57.21	24:58 77.58	21:22 66.70	243.42
9. Carl Rambo	18:47 62.37	21:45 65.25	10:14 29.26	26:46 95.71	21:03 65.41	- 0	226.37
10. Ken Bauer	25:21 84.17	17:39 52.95	- 0	11:19 40.46	5:17 16.42	13:23 41.78	178.90

#### STATE OF THE ART

The TARA 18, designed some years ago by Ron Wittman, keeps popping up. The version shown on page 3 is taken from the Vancouver GMC newsletter "Hothead", and has been a consistent winner in the hands of Rick Lim in the Agrodome in Vancouver, BC, Canada

#### CHANGE OF PACE

It's been a long time since this column appeared, and that's probably a bad thing. A change of pace is often what we all need, and "Scraps" is a fun model that has been very popular in the Cleveland area. Vern Hacker tells more: (Plan on page 4.)

Enclosed is the Scraps plan I told you I would send. I find from Laddy Plachy that it came from a 1960 Model Aircraft Magazine, the British publication. We have had quite a bit of fun with this design at club contests.

Our recent contest was held in a garage. The best time was 1:51, 2nd was 1:39 and 3rd over a minute. If there is enough room to bang it around on the ceiling without it hanging up, times are good. I have done 2:36 in my 7' 9" high basement.

Most of us are not using that much dihedral. It will fly well with about 3/4" under each wing tip. Try one for yourself. It is a fun deal for a club.

**CONTEST RESULTS**

**Winged Motors Indoor Contests, Park Hill North Jr. High, Kansas City, Mo. Feb. 15, 1975**

**Indoor Scale**

1. Carl Perkins - Fiesler Storch
2. Dick Stamm - Curtis Robin
3. Carl Perkins III - Dehaviland Moth

**Jr. Peanut Scale**

1. Charlie Krekovich - Nesmith Cougar
2. Bill Langley, Jr. - Nesmith Cougar
3. Don Cory - Nesmith Cougar

**Open Peanut Scale**

1. John Krekovich - Andraesson Biplane
2. Carl Perkins - 1911 Cessna
3. Bill Langley - Nesmith Cougar

**HL Glider**

1. Charlie Krekovich 55.8
2. Bill Langley 49.7
3. Bruce Perkins 46.4

**March 8, 1975**

**Easy B**

1. Dick Hardcastle 9:42
2. Stan Chilton 8:21
3. Bill Langley 6:51

**Indoor Stick**

1. Dick Hardcastle 9:21
2. Stan Chilton 9:08
3. Bill Langley 8:59

Highest No Touch time - 3:44, Roger Schroeder

**C. I. A. 2nd Annual Indoor Meet, Anderson, Indiana**  
 March 9, 1975, Anderson High School Gym, 42' ceiling  
 331 official flights by 54 fliers from Milwaukee, Cincinnati, Indianapolis, Toledo, Bloomington, Ft. Wayne, Chicago, St. Louis, Cleveland, Dayton and others from Kentucky and Michigan.

**Jr.-Sr. HLG**

1. Mike Stoy 76.3
2. Ran St. Clair 61.2
3. Steve Robbins 53.2
4. Bob Perkins 40.8
5. Curtis Zink 34.0
6. John Andras 32.2
7. Jim St. Clair 30.3
8. Roger Wheeler 29.5
9. Danielle St. Clair 28.2
10. Carmen Zink 26.0

**Open HLG**

1. Bucky Servaites 85.0
2. Phil Sullivan 84.7
3. Stan Stoy 82.4
4. Bob Larsh 81.5
5. Chuck Markos 76.0
6. Denny Dock 75.6
7. Jim Miller 72.0
8. Bob Klipp 70.3
9. Chris Matsuno 70.2
10. George Pharr 69.8

**Jr.-Sr. PennyPlane**

1. Bob Perkins 6:28.9
2. Ran St. Clair 5:25.0
3. Tom Kastner 3:25.6
4. John Ferrara 2:13.2
5. Jim St. Clair 2:03.0
6. Steve Robbins 1:55.9
7. Roger Wheeler 0:56.0

**Open PennyPlane**

1. Marty Richardson 9:40.2
2. Bucky Servaites 8:57.0
3. Charlie Sotich 8:54.0
4. Rollo Anderson 8:09.5
5. Robert Mullins 7:51.3
6. Gordon Wisniewski 7:13.1
7. Jim Miller 7:07.8
8. Bob Larsh 6:58.5
9. George Pharr 6:43.2
10. Chris Matsuno 6:24.5

**Peanut Scale**

1. Jim Gerz 8
2. Jim Miller 10
3. Jim Pulley 13
4. Ted Dock 14
5. Ken Johnson 17
6. Chuck Markos 17
7. Charlie Sotich 18
8. Ron St. Clair 23
9. Don Wright 23
10. Danny Dock 24

**AMA Scale**

1. Chuck Markos 150.6
2. Bill Naylor 139.5
3. Jim Gerz 118.3
4. Dave Bloom 110.7
5. Ken Johnson 110.4
6. Jim Bair 108.0
7. Jack Fike 107.9
8. Charlie Sotich 102.0
9. Ted Dock 91.4
10. Bill Pinnell 86.0

**LIAMAC Indoor Championships, May 4, 1975, Cantiague Park, Hicksville, NY., 50' domed site.**

**Jr.-Sr. HLG**

1. Adam Minissian 77.2
2. Barry Paillet 75.9
3. Darius Kaufman 75.7
4. Bruce Paillet 72.9
5. Noel Kaufman 66.2

**Open HLG**

1. Dan Domina 85.8
2. John Kaufman 81.0
3. Jack Minissian 80.5
4. Ron Williams 79.2
5. Al Vollmer 78.3

**Jr.-Sr. Easy B**

1. Richard Whitten 9:07.0
2. Leonard Garrick 8:51.4
3. Adam Minissian 6:46.0
4. Barry Paillet 6:44.1
5. Bruce Paillet 4:49.5

**Open Easy B**

1. Frank Hannes 9:14.0
2. Al Vollmer 8:11.5
3. Ron Williams 7:22.8
4. Joe Nuszer 5:07.0

**Jr.-Sr. Peanut Scale**

1. Richard Whitten 105

**Open Peanut Scale**

1. Don Garofalow 162

2. Adam Minissian 97.5
3. Bruce Paillet 95.5
4. Barry Paillet 84
5. Leonard Garrick 70
2. Jack Minissian 132.5
3. Joe Nuszer 102
4. Ed Franklin 101
5. Jean Paillet 100

**Indoor Stick**

1. Richard Whitten 11:38.8
2. Dan Domina 10:37.5
3. Frank Haynes 10:21.5
4. Ed Franklin 9:13.5
5. Joe Nuszer 8:55.0

**Indoor Scale**

1. Jack Minissian 179
2. Adam Minissian 148
3. Joe Nuszer 143
4. Bob Bender 140
5. S. Panleczk 136

**LIAMAC CAT. I INDOOR MEET, May 18, 1975, Long Beach NY**  
 Cat. I site

**Jr.-Sr. Peanut Scale**

1. Richard Whitten 92
2. Mark Trubowitsch 36.5
3. Greg Lavardera 32.5
4. Greg Trubowitsch 27.25

**Open Peanut Scale**

1. Dan Domina 143
2. Don Garofalow 137
3. Jack Minissian 117.5
4. Carrill Allen 108.5
5. Frank Haynes 93

**Jr.-Sr. HLG**

1. Darius Kaufman 59.6
2. Joe Nuszer, Jr. 59.2
3. Bruce Paillet 57.5
4. Noel Kaufman 54.8
5. Greg Techuk 52.0

**Open HLG**

1. Jack Minissian 67.2
2. Dan Domina 65.7
3. Joe Nuszer 61.2
4. John Kaufman 59.6
5. George Rivers 58.9

**Jr.-Sr. Easy B**

1. Richard Whitten 9:23.4
2. Greg Techuk 5:19.0
3. Joe Nuszer, Jr. 4:05.0
4. Barry Paillet 1:29.6

**Open Easy B**

1. Pete Andrews 11:06.0
2. Jack Minissian 10:44.3
3. Frank Haynes 9:46.5
4. Carroll Allen 8:23.0
5. Al Vollmer 7:57.3

**Indoor Stick**

1. Dan Domina 19:10.7
1. Pete Andrews 17:45.0
3. Richard Whitten 13:01.0
4. Ron Williams 12:16.5
5. Joe Nuszer 10:46.0

**Indoor Scale**

1. Don Garofalow 123.3
2. Bob Bender 123
3. Jack Minissian 116
4. Jean Paillet 113.5
5. Dan Domina 101

**2ND ANNUAL MIDWESTERN STATES INDOOR CHAMPIONSHIPS,**  
 May 17-18, 1975, Madison St. Armory, Chicago

**FAI Stick**

1. Dennis Jaecks 41:30
2. Charlie Sotich 35:53
3. D. Brown 29:05
4. J. Rogers 21:11
5. Dick Hardcastle 20:30.8

**Indoor Stick**

1. Charlie Sotich 22:31.0
2. Dennis Jaecks 19:30.8
3. Dick Hardcastle 16:50.8
4. Richard Doig 16:11.6
5. D. Brown 14:28.0

**Indoor Cabin**

1. Dennis Jaecks 9:35.4
2. D. Brown 3:31.6

**Jr. Paper Stick**

1. Bill Schuh 3:49.4
2. D. Stevens 3:08.0
3. G. Stevens 2:29.0
4. M. Morantz 1:24.0

**Sr. Paper Stick**

1. D. Brown 15:28.0

**Jr. PennyPlane**

1. R. Mate 4:49.0
2. Bill Schuh 3:30.0
3. M. Morantz 3:28.8
4. D. Stevens 3:27.0
5. G. Stevens 3:15.0

**Open Paper Stick**

1. Dennis Jaecks 17:26.0
2. G. Wisniewski 16:42.4
3. Chuck Markos 16:11.2
4. Richard Doig 15:36.2
5. Charlie Sotich 14:50.8

**Open PennyPlane**

1. Dick Hardcastle 9:58.2
2. Bob Larsh 9:36.4
3. G. Wisniewski 8:50.4
4. Charlie Sotich 8:42.8
5. R. Hayes 8:25.6

**Sr. PennyPlane**

1. D. Brown 9:51.2
2. Keith Gordey 4:59.0

**Jr. HLG**

1. D. Stevens 88.2
1. G. Stevens 88.2
2. Bill Schuh 75.2
3. D. Jones 29.4
4. M. Morantz 14.8

**Open HLG**

1. Chuck Markos 112.4
2. Bob Larsh 110.4
3. J. Jensen 104.8
4. Dick Swenson 90.8
5. Richard Doig 85.0

**Sr. HLG**

1. M. Stoy 107.8
2. Keith Gordey 104.0
3. R. Hayes, Jr. 103.6
4. A. Schmidt 93.2

**Indoor Scale**

1. K. Ward 174.5
2. J. Gerz 171.6
3. Chuck Markos 160.0
4. B. Naylor 151.4
5. D. Bloom 147.6

**Peanut Scale**

1. Charlie Sotich 151
2. D. Bloom 149
3. R. Hardcastle 146
4. K. Ward 145.6
5. Chuck Markos 142.6

**Open Champion**

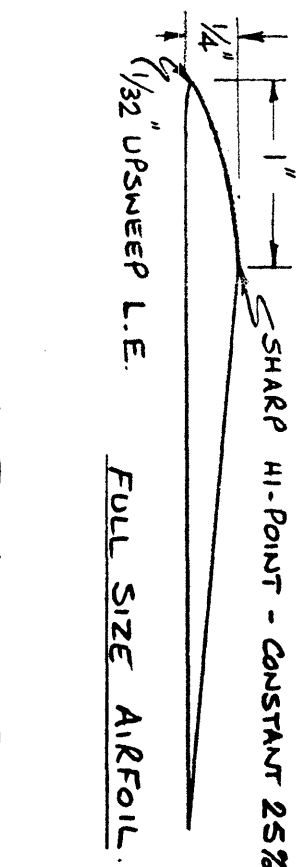
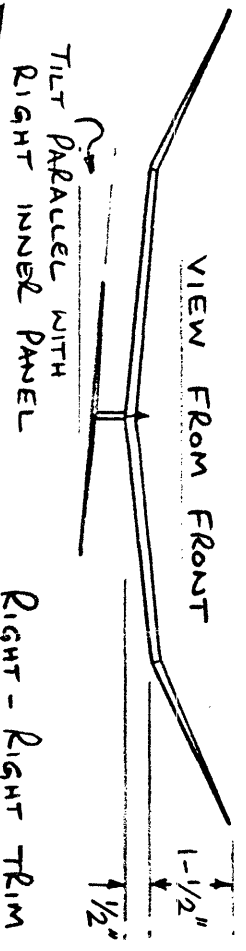
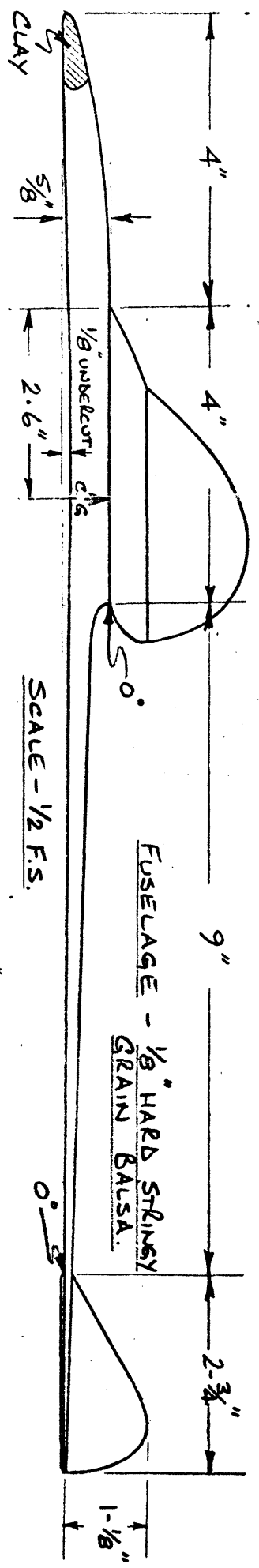
- Dennis Jaecks 386 pts.

**Sr. Champion**

- D. Brown 400 pts.

**Jr. Champion**

- Bill Schuh 358 pts.



WING - 1/4" SHT, LIGHT STRAIGHT STRINGY GRAIN

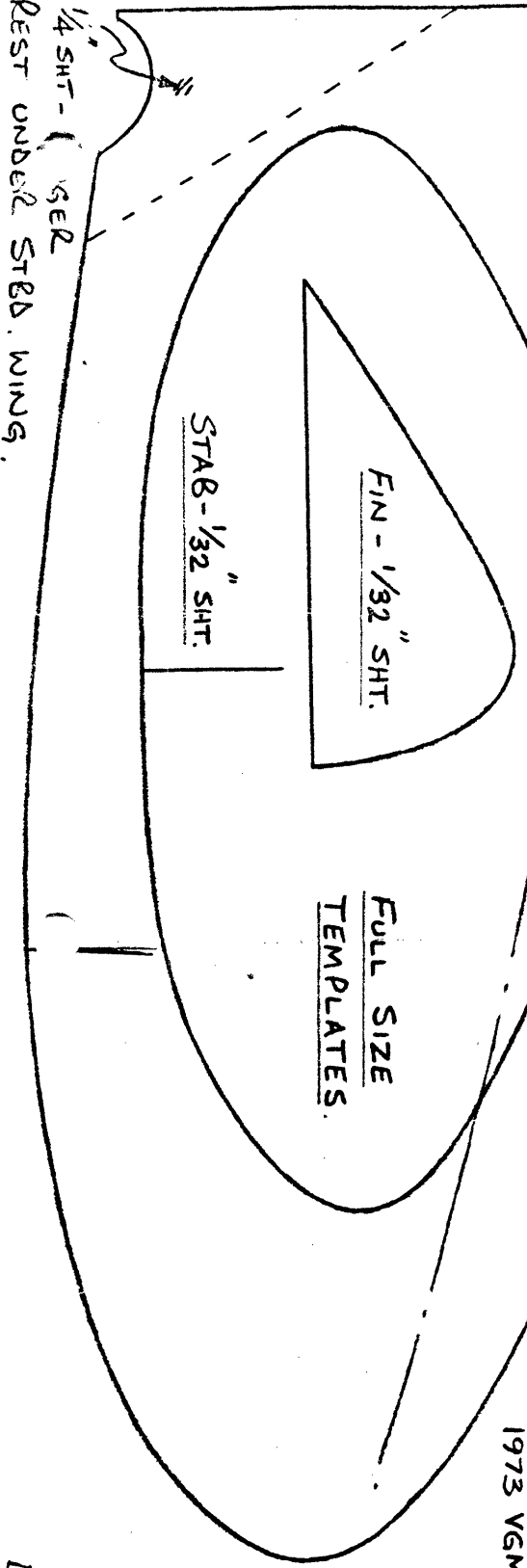
# TARA-18

AS MODIFIED BY RICK LIM  
FROM ORIGINAL BY RON WITTMAN.

HI-POINT

1/8" BIAS CUT FOR TIP WASHOUT.

1ST - VGMC JUNE '73 CAT III - 111.6 SECS  
1ST - VGMC OCT '73 CAT III - 93.8 SECS  
1973 VGMC IHLG CHAMPION.

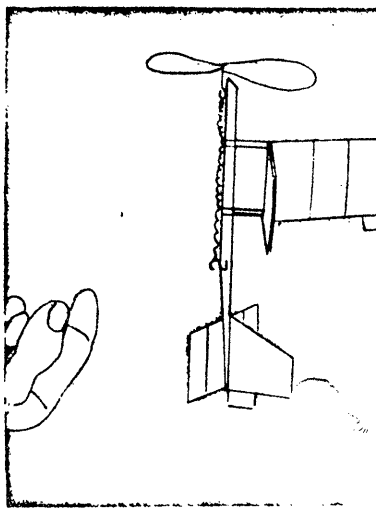


Drawn Nov 74

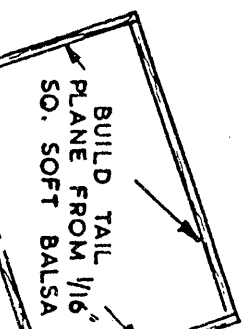


# "Scraps"

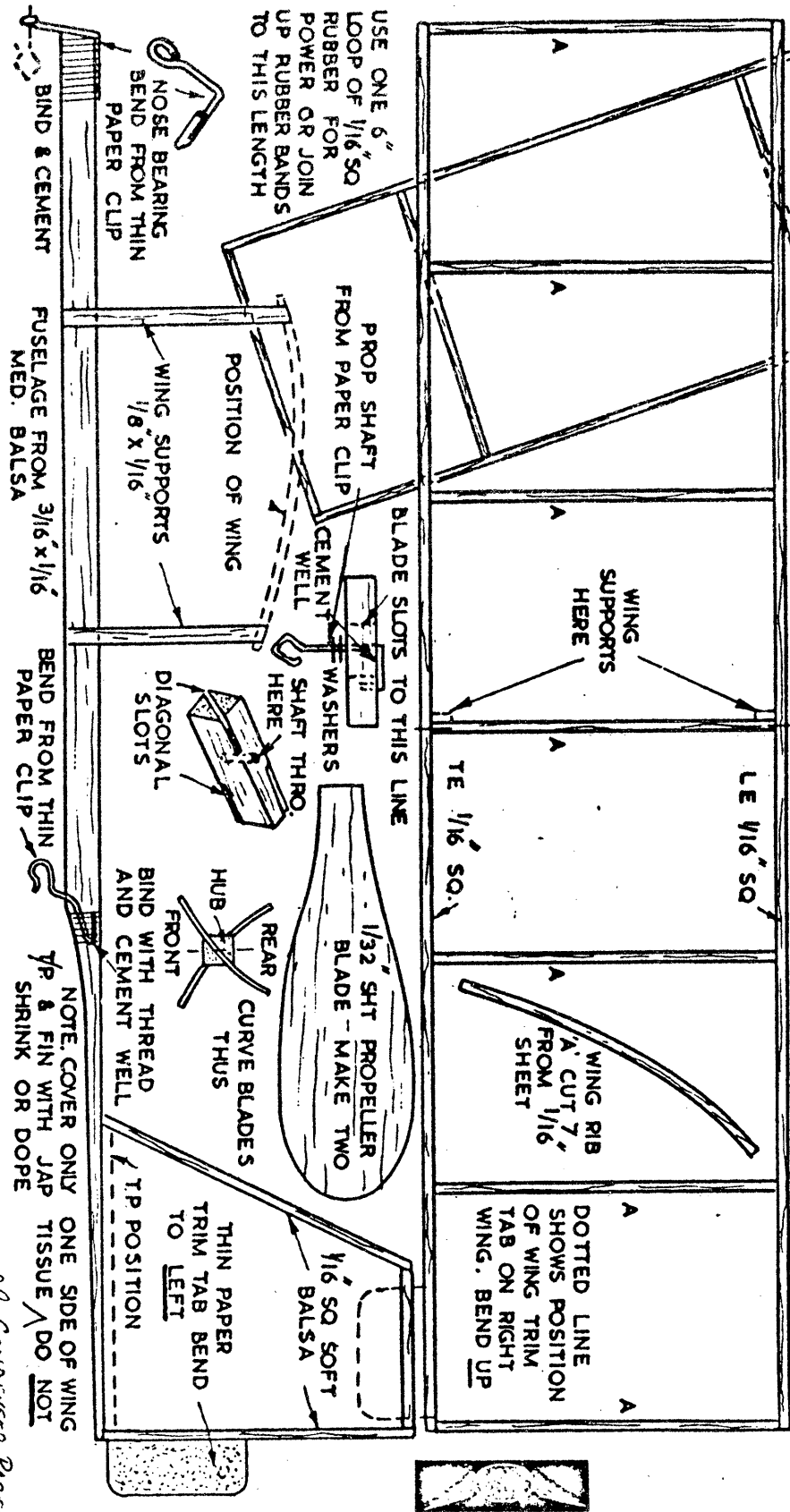
A "dive" in the scrap box and burms "round the parlour to add to Christmas fun.



- Building Sequence**
1. Remove this page from the magazine and place it over a flat building board.
  2. Pin fuselage to plan and cement wing supports in place. Trim them accurately to length. Remove from plan and bind wire parts in place.
  3. Build fin onto rear fuselage boom.
  4. Pin down wing L.E. and T.E. (pins beside the wood, not through it).
  5. Cement ribs in place.
  6. Build tailplane and cement to top of fuselage boom.
  7. Make propeller and prop shaft.
  8. Cover wing, tailplane and fin with waterproof or dope.
  9. Adjust trim tabs, fit rubber motor, lubricate prop bearing.
  10. Wind on 100 turns and launch model at its flying speed. It will turn left in about 8 ft. circles.



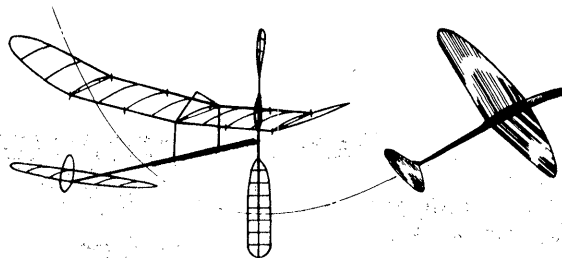
**RECOMMENDED DIHEDRAL: CRACK LE & TE HERE! RE CEMENT WITH 2" DIHEDRAL AT EACH WING TIP**



## RULES.

1. YOU MUST KEEP ALL OUTLINES THE SAME, BUT YOU CAN CHANGE THE WOOD SIZES.
2. YOU MAY USE A INDOOR THRUST BEARING.
3. NO MICROFILM OR MICROLITE.
4. 1 FLIGHT COUNTS FROM 3 OFFICIALS.
5. NO BRACING OR HOLLOW STICKS ALLOWED.
6. 2 INCH DIHEDRAL IS OPTIONAL.

# INDOOR



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

Jr. Indoor HLG

1. Jimmy Clem	80.6
2. Barry Pallet	79.2
3. Bill Schuh	74.6
4. Guy Larsen	72.4
5. John Arthur	65.6
6. Steve Calhoun	53.0
7. Tommy Giertz	51.6
8. John McCully	49.8
9. Mike Clem	49.4
10. Christopher Moore	43.0
11. Peter Brown	42.6
12. Brian Petty	36.0
13. Tom Kreiger	32.6
14. Brian White	22.8
15. Bradley McGuire	14.6

Sr. Indoor HLG

1. Mike Langlois	92.0
2. Michael Stoy	90.0
3. Greg Simon	86.8
4. Brian Pardue	85.6
5. Arnie Schmidt	83.8
6. Larry McFarland	77.2
7. Stephen Robbins	70.6
8. Jon Rogers	68.0
9. James Bayley	66.8
10. Daniel Barry	66.6
11. Dale Elder	62.6
12. Allen Honey	

Open Indoor HLG

1. Paul Shallor	101.6
2. Chuck Markos	97.2
3. Mike Fedor	94.0
4. Dan Domina	92.4
5. Mike Ransom	90.8
6. Phillip Sullivan	88.8
7. Richard Doig	87.4
8. Dan Belieff	86.2
9. Ray Harper	85.0
10. Stanley Stoy	84.8
11. Anthony Vaughan	84.4
12. Glenn Lee	83.5
13. William Hutchins	81.4
14. Phillip Bayly	81.4
15. Frank Sharpton	81.2
16. Robert Dunham II	80.6
17. Grady Turner	79.2
18. Gilbert Robbins	76.4
19. Rol Anderson	74.6
20. Denny Dock	69.6
21. Dick Swenson	67.0
22. Jim Stewart	67.0
23. Robert Dunham	66.6
24. Arthur White	66.0
25. Gene Simpson	65.4
26. James Bradley II	65.2
27. Robert Isaacs	65.2
28. John Arthur	59.8
29. Ronald Robert1	59.8
30. Rudolph Schuh	59.4
31. Terry Rinert	12.8

Jr.-Sr.-Op. Indoor Cabin

1. Richard Whitten	13:53.9
2. Keith Gordey	13:37.3
3. Paul Shallor	12:36.7
4. Robert Dunham II	11:47.0
5. Dan Domina	11:22.0
6. Tony Schott	11:09.0
7. Dan Belieff	11:08.4
8. Greg Simon	9:59.3
9. Louis Sutter	8:17.8
10. Barry Pallet	5:37.2

Jr.-Sr.-Op. FAI Stick

1. Dan Domina	39:14
2. Richard Doig	38:52
3. Roman Szymula	33:37
4. Keith Gordey	32:13
5. Dan Belieff	30:08
6. Robert Dunham	29:24
7. Robert Dunham II	29:22
8. Charlie Sotich	29:13
9. Bill Shallor	27:14
10. Richard Whitten	24:51
11. Jimmy Clem	23:46
12. Rudy Schuh	15:42
13. Bill Schuh	12:33
14. Jon Rogers	7:34

Jr. Indoor Stick

1. Jimmy Clem	13:33.8
2. Bill Schuh	8:40.8

Sr. Indoor Stick

1. Richard Whitten	19:20.9
2. Keith Gordey	16:32.6
3. Greg Simon	14:33.2
4. Jon Rogers	5:28.0

Jr. Easy B

1. Mike Clem	5:36.0
2. John McCully	5:32.3
3. Peter Brown	1:37.2

Sr. Easy B

1. Richard Whitten	9:22.5
2. Allen Honey	2:18.5
3. Linda Brown	1:27.1

Open Easy B

1. Rolfe Gregory	11:10.1
2. Stan Chilton	10:43.6
3. Louis Sutter	9:49.0
4. Earl Hoffman	8:54.5
5. Mike Fedor	8:06.7
6. Mark Valerius	8:02.1
7. Gordon Wisniewski	7:44.2
8. Roman Szymula	7:41.5
9. Jim Stewart	7:30.9
10. Tony Schott	6:51.6
11. Tommy Hepler	4:27.6
12. Richard Doig	0:24.4

INDOOR CATEGORY CHAMPION

Dan Domina 287.12 pts.

Open Indoor Stick

1. Stan Chilton	20:34.4
2. Richard Doig	19:50.0
3. Dan Domina	17:55.2
4. Earl Hoffman	15:23.9
5. Bill Shallor	15:15.5
6. Charlie Sotich	14:53.6
7. Roman Szymula	14:42.8
8. Dan Belieff	14:20.0
9. Robert Dunham II	13:07.0
10. Robert Dunham	12:57.0
11. Ronald Rboert1	12:49.0
12. Rudy Schuh	5:42.3

Jr.-Sr. Indoor Scale

1. Barry Pallet	112 pts.
2. Allen Honey	76
3. Guy Larsen	65
4. Richard Whitten	56

Open Indoor Scale

1. Chuck Markos	164 pts.
2. John Martin	154.2
3. Mike Fedor	104.6
4. Winfred Frazier	101
5. Mike Ransom	100.6
6. Rolfe Gregory	100
7. Charlie Sotich	94
8. Jerry Murphy	89
9. Dan Domina	86
10. Vic Lareen	79
11. Ted Dock	79

Jr. Paper Stick

1. Jimmy Clem	9:38.7
2. Bill Schuh	9:26.4
3. Barry Pallet	8:48.2
4. Mike Clem	5:26.0
5. John McCully	5:10.4

Sr. Paper Stick

1. Greg Simon	14:06.2
2. Keith Gordey	13:35.3
3. Richard Whitten	12:00.8
4. Allen Honey	3:17.0

Open Paper Stick

1. Dan Domina	17:16.5
2. Charlie Sotich	13:43.5
3. Paul Shallor	13:34.2
4. Richard Doig	13:09.0
5. Robert Dunham II	13:02.5
6. Chuck Markos	12:59.2
7. Bob Dunham	12:15.8
8. Mark Valerius	11:53.8
9. Mike Fedor	11:25.2
10. Rol Anderson	11:17.8
11. Bill Shallor	11:00.0
12. Louis Sutter	10:15.4
13. Rudolph Schuh	8:37.6
14. Dan Belieff	8:00.0
15. Roman Szymula	7:37.5
16. Gordon Wisniewski	7:30.6

Nats Picture Story - Photos by Carl Wheeley unless noted otherwise; photo printing by Kyle Babick.

Page 2, Row 1:

Left - Jimmy Clem with 1st place Indoor Stick.  
Center - Rubber foam HLG rack.  
Right - Mike Ransom, Grand National Champ, rests while holding for Mike Fedor. (Tenny)

Row 2:

Left: Sandy Frank, Indoor CD, and Janie Parris kept a tight rein on the activity.  
Center: Chuck Markos, 1974 Indoor Champ, with Paper Stick  
Right: Keith Gordey, 2nd place Indoor Stick.

Row 3:

Left: Dan Belieff with his FAI model.  
Center: Amazingly light and detailed Cessna by Butch Hadland. (Tenny)  
Right: Charlie Sotich with 90 cm Dram Dip.

Row 4:

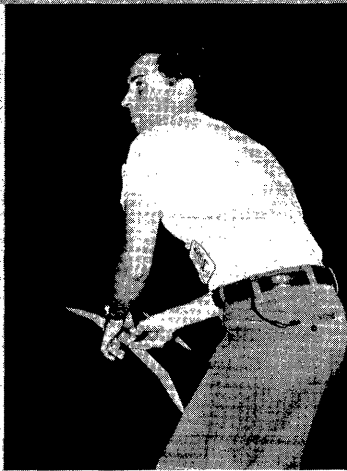
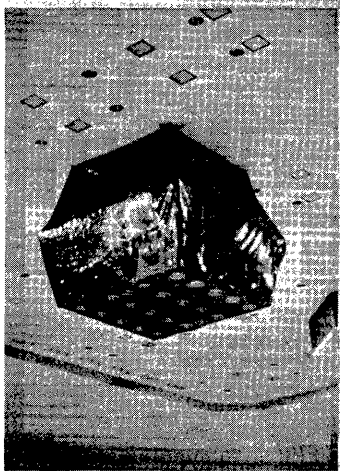
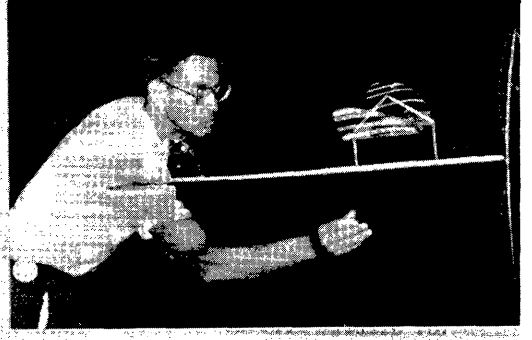
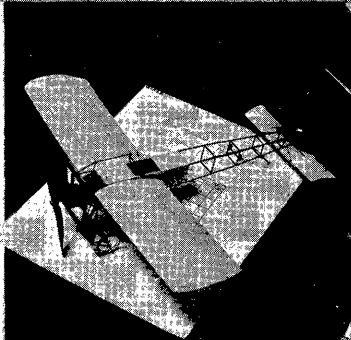
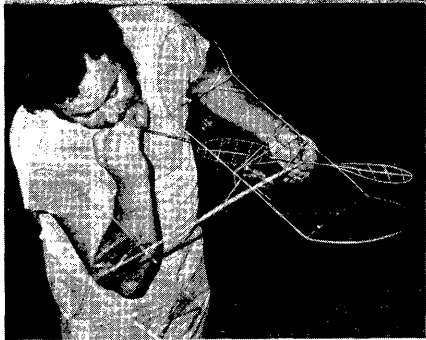
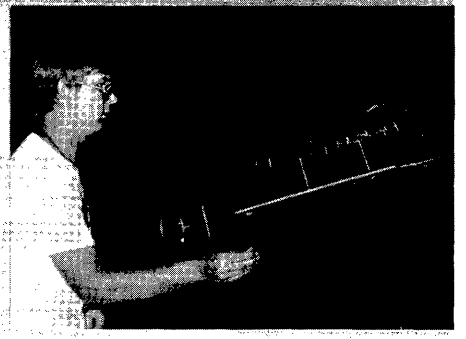
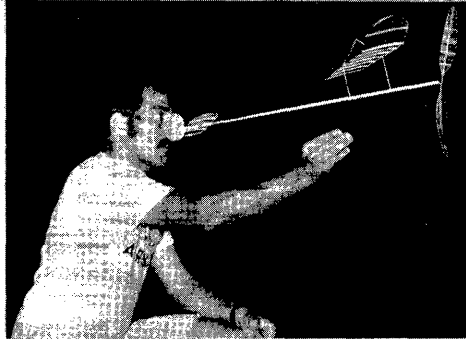
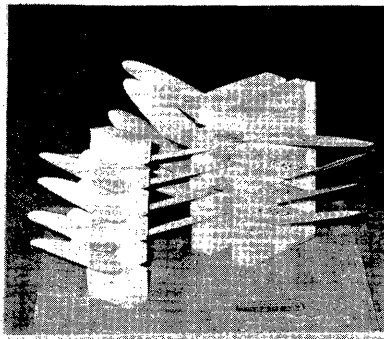
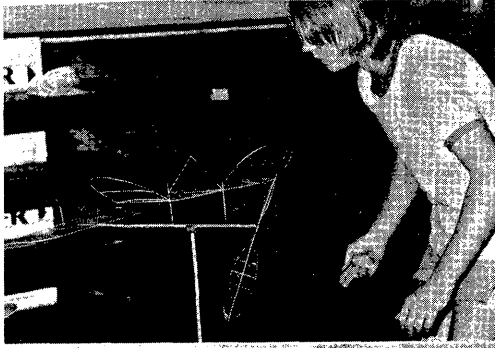
Left: The jaws of death were shrouded! (Tenny)  
Left center: Charlie Sotich discusses the fine points of his Volksplane.  
Right center: Dan Domina, 1975 Indoor Champ, winds up to fire off 4th place HLG.  
Right: Dunham Dynamic Duo.

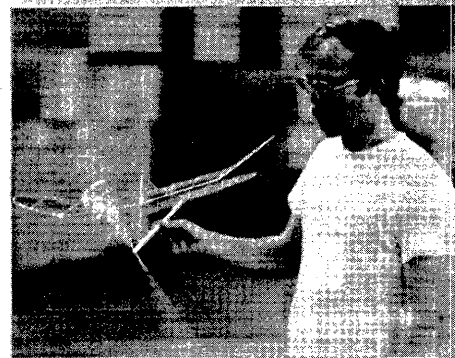
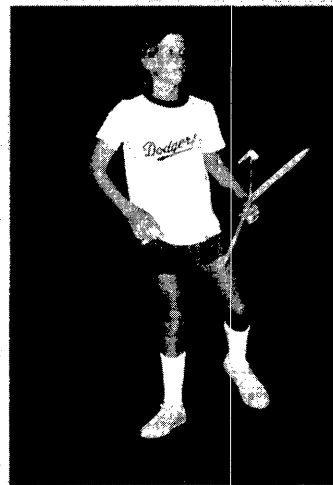
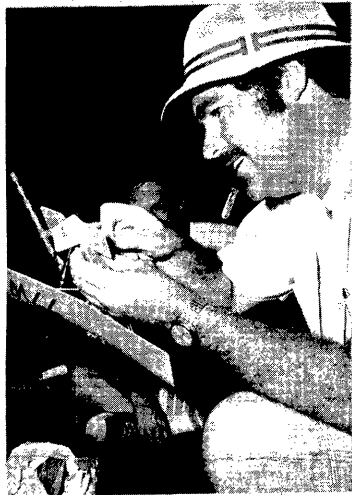
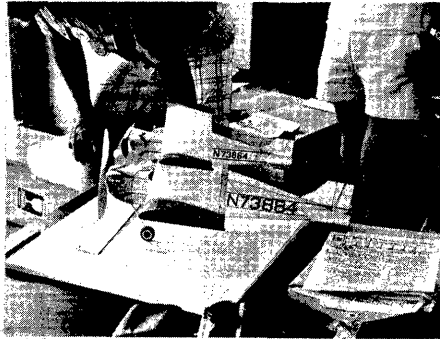
Page 3, Row 1:

Left: John Martin with one of many scale models.  
Center: Butch Hadland's Lacey M-10 piggy-backs John Martin's M-10. (Tenny)  
Right: AMA Scale Judges - Chuck Dial (l), D. B. Mathews and Butch Hadland (r).

Row 2:

Left: Jerry Murphy performs delicate surgery.  
Center left: Jimmy Clem (l) and John McCully with coach Jim Clem in foreground.  
Center right: Guy Larsen with 4th place HLG.  
Right: George Meyer adjusts American Flyer.



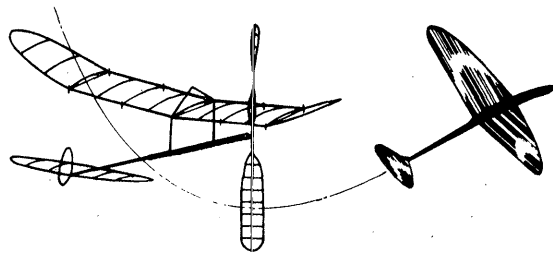




# INDOOR

## NEWS and VIEWS

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



THE 1975 TEAM SELECTION FINALS

	1	2	3	4	5	6	Regional/Total
1. Bucky Servaites	34:11 100.0	7:57 21.76	33:58 100.0	33:25 100.0	38:00 100.0	0	595/1495
2. Jim Richmond	32:52 96:17	34:28 94:36	23:42 69:77	36:05 100.0	0	0	600/1472
3. Bud Romak	29:29 86.24	36:32 100.0	20:32 60.45	29:32 81.85	35:25 93.21	37:53 100.0	553/1433
4. Pete Andrews	13:10 38.52	0	33:48 99.50	31:40 87.78	36:44 96.66	33:07 87.43	532/1384
5. John Triolo	22:02 64.45	26:16 71.91	8:51 26.05	32:47 90.85	34:40 91.24	35:55 94.83	551/1382
6. Dan Domina	32:40 95.58	20:34 56.30	12:00 35.33	30:27 84.40	29:48 78.42	32:48 86.59	564/1384
7. Paul Allen	28:15 82.65	24:52 68.07	29:02 85.86	32:51 91.05	34:45 91.45	28:21 74.84	532/1336
8. John Kukon	25:55 75.83	33:38 92.06	25:22 74.68	28:05 77.83	23:56 62.98	28:59 76.50	568/1307
9. Dick Kowalski	24:39 72.12	24:48 67.89	23:10 68.21	0:43 1.99	31:41 83.37	33:45 89.10	564/1298
10. Ray Harlan	25:04 73.34	11:56 32.67	10:07 29.78	27:46 76.97	31:06 81.84	29:12 77.09	587/1295
11. Erv Rodemsky	25:46 75:39	3:41 10:08	28:04 82:63	29:58 83:07	9:03 23.82	29:35 78.09	560/1291
12. Ed Stoll	19:42 57.63	16:40 45.62	19:33 57.56	30:16 83.90	30:54 81.32	28:07 74.23	570/1288
13. Bob Randolph	28:03 82.07	26:49 73.42	23:08 68.09	24:55 69.07	30:30 80.26	7:07 18.79	580.5/1287.5
14. Al Rohrbaugh	20:57 61.27	29:40 81.22	24:09 71.10	28:10 78.08	31:32 82.97	28:50 76.11	554.7/1287.7
15. Ron Ganser	23:23 68:40	31:24 85.96	19:02 56.03	29:32 81.85	33:19 87.68	28:32 75.32	505/1271
16. Larry Cailliau	26:50 78.50	30:38 83.85	17:46 52.31	26:04 72.26	26:46 70.45	28:19 74.76	537/1248
17. Sal Cannizzo	26:46 72.47	11:46 32.21	9:45 28.70	26:29 73.39	10:57 28.82	29:43 78.46	574/1247
18. Stan Chilton	20:14 59.19	22:39 62.00	0	21:48 60.42	31:50 83.76	28:00 73.92	587/1246
19. Bob Champine	16:45 49.00	29:00 79.39	9:37 28.31	10:26 28.91	27:32 72.45	28:45 75.90	542/1225
20. Dick Hardcastle	24:02 70.30	27:22 74.92	0:05 0.24	1:14 3.42	23:30 61.84	24:45 65.34	569/1201
21. Richard Whitten	19:07 55.92	2:48 7.66	7:21 21.64	20:13 56.04	26:26 69.55	32:12 85.01	530/1162
22. Bob Platt	24:47 72.50	17:12 47.08	6:14 18.35	5:52 16.26	30:57 81.45	12:20 32.56	531/1134
23. Hal Crane	9:44 28.47	16:31 45.21	18:02 53.08	26:50 74.36	21:46 57.29	26:42 70.49	525/1131
24. Bob Gibbs	12:28 36.47	19:47 54.15	21:43 63.94	19:06 52.94	18:21 48.29	0	569/1082

The Picture Story

The photo pages are oriented lengthwise this time, and we are indebted to Bucky Servaites and Ed Whitten for them. Photos by Whitten except as noted by (S).

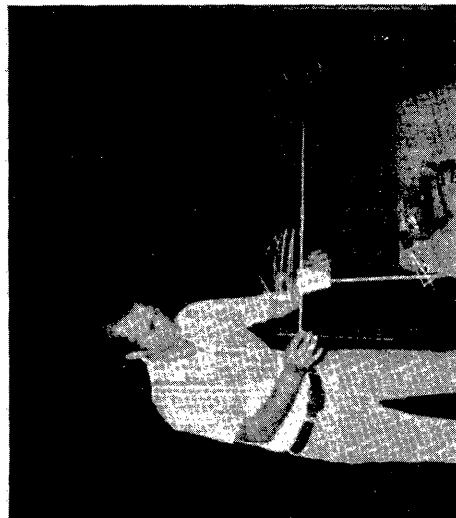
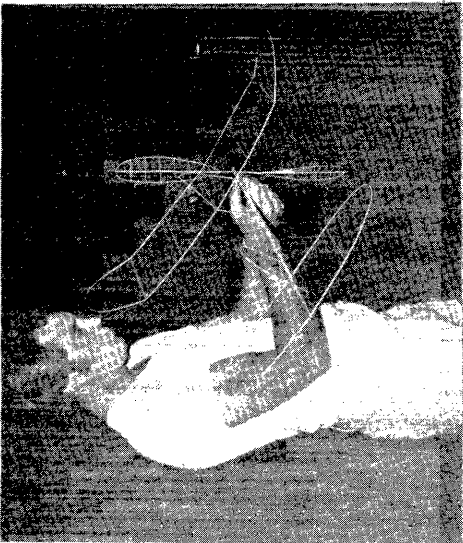
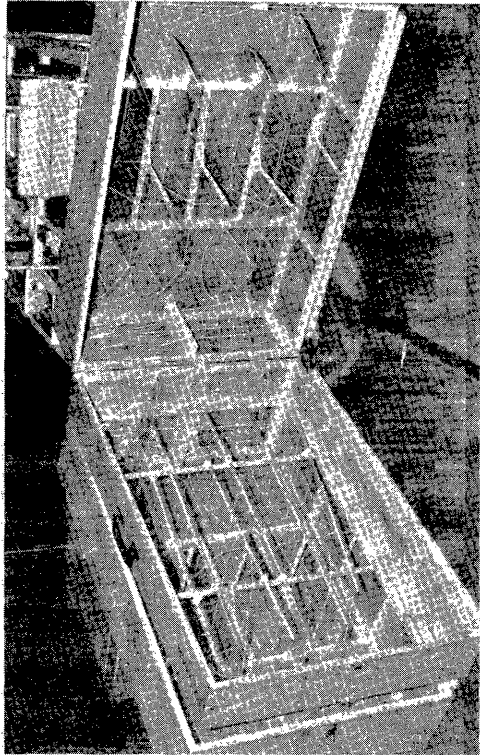
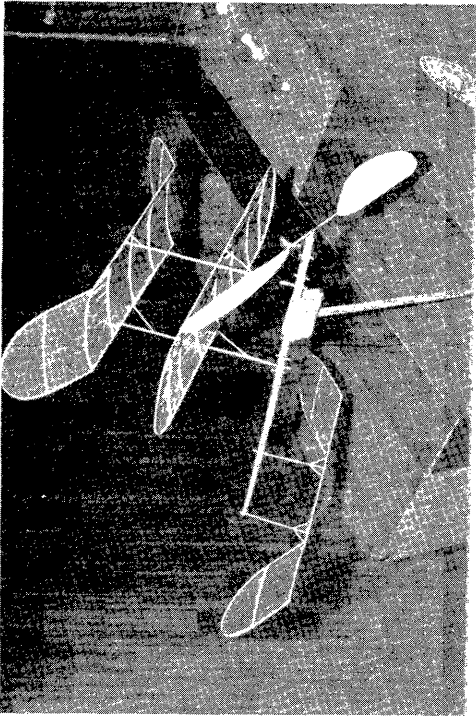
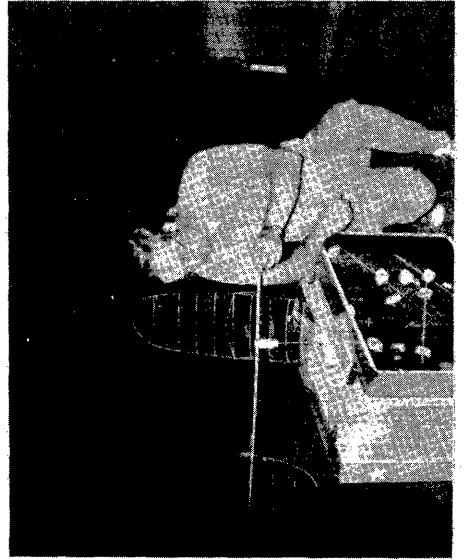
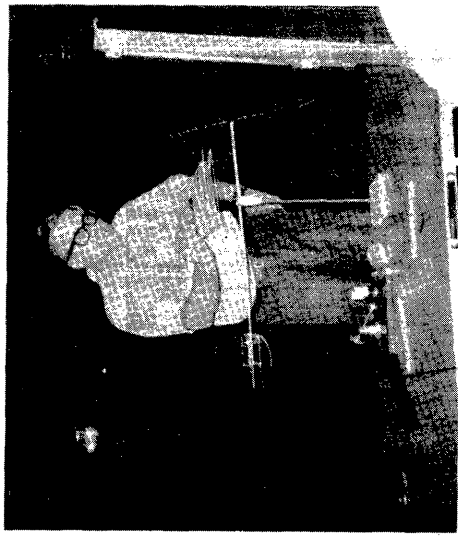
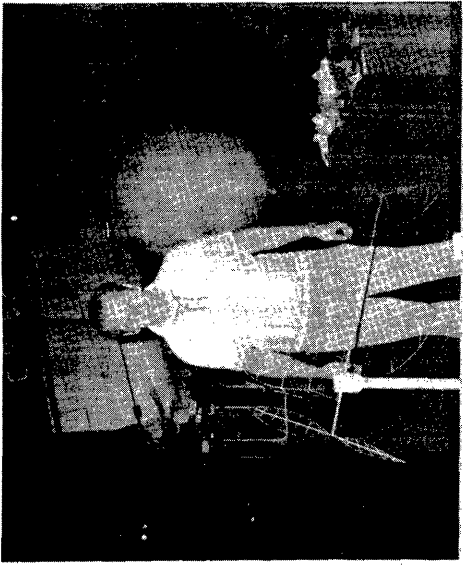
Page 2 Row 1

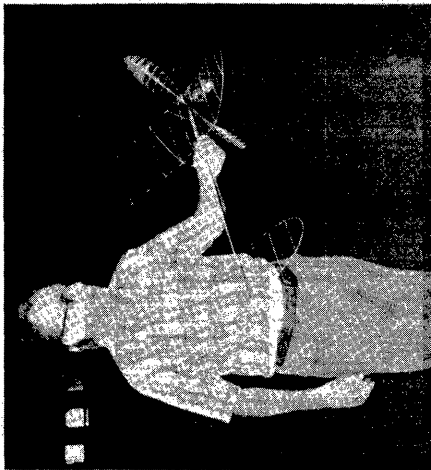
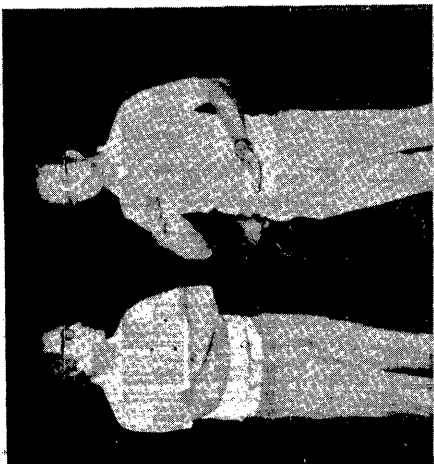
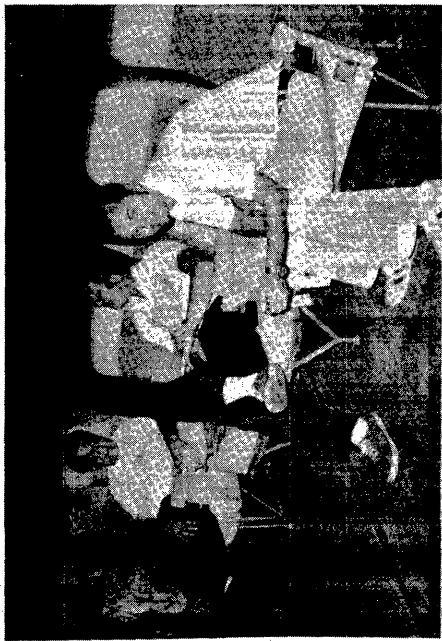
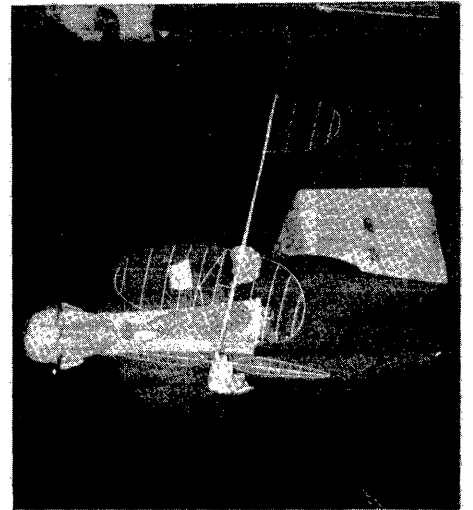
Left - Larry Cailliau with repaired model - all his models required almost total recovering after the trip! (S)  
 Center - John Kukon's PennyPlane - a tandem design worked up in collaboration with Doug McLean - was used to test the air during extreme turbulence. (S)

Right - Erv Rodemsky's models were very light, yet big. His special bracing scheme uses "V" wing posts and no cabane; model is very rigid. Fast climb put one in the top in 3 minutes.

Row 2

Left - Bud Romak made a strong drive and made the team in the 6th round.  
 Center - Romak's box is a compact "hangar" for 8 models; three WCh teach the value of one box if possible! (S)  
 Right - Ron Ganser adds a patch. (cont. P. 4)







Row 3

Left - Bob Champine and Bob Gibbs take a timing turn.  
Center - Dan Domina counts out turns for Ray Harlan. (S)  
Right - Bucky Servaites with see-thru box. This type of box construction is invaluable at a foreign customs office - otherwise you might have to open the box.!

Page 3 Row 1

Left - Bucky Servaites and Jim Richmond discuss the score needed by 6th round fliers to join them on the team.  
Center - Al Rohrbaugh, Larry Gailliau and Bud Romak take a rest break.  
Right - Contest Hq. under firm and capable control of Gloria Alt, who did fine job. Bob Champine, Hank deKat, Ed Stoll and Ron Ganser check in.

Row 2

Left - Dick Kowalski ponders his next move.  
Center - Stan Chilton checks in John Triolo's model.  
Right - Dan Domina and model. Large, unbraced parabolic stabs were popular.

Row 3

Left - Richard Whitten with modified Kalina design.  
Center - Bob Champine processed his model under careful scrutiny of Stan Chilton.  
Right - Pete Andrews and Time Machine - note extremely large prop. Pete lost 4 wings to wind in the hangar before Round 2; skipped Round 2 and finished meet on one wing.

FAI "Indoor Masters"

The following is a capsule summary, from info furnished by Hal Crane. Hal was a last-minute volunteer to CD the Finals, and gives high praise to Gloria Alt for her hard work and dedication in managing the meet for him.

The practice day, Sat. Aug. 30, had good conditions which allowed Richard Whitten to post 33:32 to up his record (AMA Cat. III FAI). The previous time of 31:45 was set at the Akron regional trials.

On Sunday the hangar had strong shear layers and downdrafts which finally went away in time to start Round 1 at 3 pm. A test flight at noon reached 100' before it encountered a downdraft which put it on the floor two minutes later!

Conditions on Monday ranged from fair to good; Hal rates the conditions round-by-round by noting the number of 30 minute flights per round. However, he noted that part of the flights over 30 were strongly dependent upon where the models were launched. Strong westward drift at floor level coupled with an eastward "jet stream" and an updraft at the door made for really strange flights! For an excellent "in-depth" report - see Dick Kowalski's comments in the Dec. '75 MODEL AVIATION.

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

New Members!

New member listing was omitted from the August issue, and this issue is late. Therefore, new memberships are listed by month received.

August

DONALD C. ABBOTT, 924 Liberty Lane, Stillwater OK 74074  
EDWIN J. BERGMAN, 1044 W. 131st St., Chicago IL 60608  
EARL N. HOFFMAN, 5945 Birch St. #2, Carpinteria CA 93013  
DON W. McNEILL, 5632 Kawaikni St., Honolulu HI 96821  
GEORGE W. MEYER, 5706 Abby Dr., Corpus Christi TX 78413  
ROBERT A. PECK, 6274 Lake Arago Av., San Diego CA 92119  
LOUIS C. SUTTER, 4633 Mt. Vernon Dr., Corpus Christi TX  
ERWIN R. WAGNER, 114 Morse St., Whitmore SC 29178  
ROY WHITE, 928 Linn, Sikeston MO 63801

September

CLIFFORD McBAINE, 2430 W. Cajon Dr., La Habra CA 90631  
ROBERT MULLINS, 15478 Prospect, Strongsville OH 44136

October

GEZAR BANKS, 4841 La Perla Way, La Mesa CA 92041  
EUGENE E. PIERRE, 76 Linden Ln., Princeton NJ 08540  
LEONARD WIECZOREK, 14 Ribbon St., Franklin Square Long Island NY 11010

Honorary Members

Dr. MAX HACKLINGER, Zugsplatzstrasse 15, 8035 Gauting, West Germany  
SVEN-OLOV LINDEN, Hovstavagen 15, S-703 63 Orebro, Sweden  
W. H. McGARVEY, 63 Ngatiawa St., One Tree Hill, Auckland 6, New Zealand

How Old Do You Feel?

Jody and I are now proud grandparents! Our son Kevin Brock and his lovely wife Lynn, who married in January, have a new son, Michael Alan, born Halloween morning.

This Issue

Every so often, each of us is confronted by an opportunity for service which dovetails completely with our talents, interests and inclinations. Thus it was that virtually all my time since the last issue was spent in creating a custom stage lighting control system for my church. Once the task was committed, it had to be completed within a specific time frame. As a result, newspapers and mail went unread and considerable sleep was lost. In a very real sense, each of you has contributed to the project by your patience. Thank you.

EASY B Lives!

Shortly after the Dec. '75 MODEL AVIATION arrived, a letter from Carl Wheeley indicated that an error had been made in reporting Contest Board final votes. Easy B was not changed as had been announced. Thus, our models can still be flown instead of being junked.

Note also that PennyPlane is now an official event in two classes: PennyPlane and Novice PennyPlane. The AMA P/P rules are essentially the Aeronut rules, but Novice P/P is limited to 5" max wing chord, stab max 4" x 12", solid stick and boom and no special gadgets such as variable pitch prop allows. Finally, all indoor models may be steered, using FAI steering rules.

Possible World Record!

Tom Vallee has been notified that his 22:45 flight in Cat. I is being considered as a new record. If this flight is allowed, the next mark has to be 23:13. Good flying, Tom!

Chicago Aeronuts Indoor Tournament

An interesting idea being discussed by the Aeronuts is a tournament: man vs man instead of man vs time. Winners are determined by elimination. For example, in Rubber, all classes (PennyPlane thru Stick) are combined. Contestants are divided into a number (four for example) of groups by random draw. Contestants in each group have five minute preparation time and a two minute launch time. The longest single flight determines a semi-finalist, and a similar "round" chooses the event winner.

In HLG, contestants fly a number of rounds equal to the number of contestants in his group. Each round is two consecutive launches by each contestant with all contestants launching within a count-down 10 second period. The best single flight of each round determines round winner; group winner is the winner of the most rounds. Group winners fly two-by-two with simultaneous launch. Semi-final scoring based on best two of three simultaneous launches, and the finals winner determined by best three of five simultaneous launches.

Renewal Reminder

Those who have a number like 10 or 11 in the corner of their label on this issue are due (were due) renewal in October or November respectively. Since I hope to condense the publication schedule, it will save me time if I don't have to send you a renewal notice. Thanks!

RECORDS? MAYBE!

FAI "Indoor Masters" (practice session) Aug. 30, 1975  
Lakehurst #5, Lakehurst NAS, NJ.  
Jr. Cat. III R.O.G. Stick - 9:17.2, Mark Drela  
Sr. AMA Cat. III FAI Stick - 33:30, Richard Whitten

CONTEST CALENDAR

CONNECTICUT - Glastonbury

Indoor sessions 7:30-9 pm at Glastonbury High Gym on dates to be announced in Dec. '75 and Jan., Feb. and Mar. 1976. Evening dates set on Apr. 13, May 11 and June 8, 1976. Sessions on Sundays, 8:30 am-1:30 pm, Jan. 11, Mar. 14 and May 2, 1975. Indoor contests, 8 am-5 pm, Dec. 7, 1975 and Feb. 8 and Mar. 4, 1976. George Armstead, 89 Harvest Lane, Glastonbury CT 06033, ph. 203-633-7836.

FLORIDA - Miami

Indoor Fly-Ins at Miami Dade North College, 9 am-2 pm, Dec. 14, 1975 and Jan. 11, Feb. 8, Mar. 7, Apr. 11 and May 9, 1975. Indoor contests at Goodyear Hangar, Opa Locka Airport, 9 am-5 pm, Nov. 30, Dec. 28, 1975 and Jan. 25, Feb. 22, Mar. 21, Apr. 25 and May 23, 1976. Confirm Hangar dates by calling 858-6363. Dr. John Martin, 3227 Darwin St., Miami FL 33133.

**ILLINOIS - Chicago**

Delta Dart and 90 Minute Glider (90 min, to build HLG from scratch) contest set for Dec. 28, 1975, and Glenview NAS Drill Hall, Glenview, Ill. Otto Curth, 2107 Center Ave., Northbrook IL 60060.

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

Indoor sessions at DuPont Gymnasium, (Vassar St. and Mass. Ave., Cambridge MA; use Vassar St. entrance), Nov. 22 and Dec. 13, 1975 and Jan. 17, Feb. 14, Mar. 20 and Apr. 17, 1976, 6 pm - 10 pm. Contest May 8, 1976, 10 am - 8 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland MA 01778, ph. 617-358-4013.

**NEW JERSEY - Livingston**

The Union Model Airplane Club is again sponsoring indoor sessions at the Livingston School Gym & Auditorium, 7 pm - 10 pm, on Dec. 11, 1975 and Jan. 8, Feb. 12, Mar. 11, Apr. 8 and May 13, 1976. Dan Domina, 4701 Fox Run Dr. Plainboro NJ 08536.

Call For Papers

The National Free Flight Society is soliciting papers for the 1976 NFFS Symposium to be held at the 1976 Nats. Papers will be published in the 1976 Symposium volume whether or not the author is able to present his paper personally at the Nats. Papers should cover some aspect of science or art of free flight models, including technical studies, practical design and engineering as applied to models, new or unusual model aircraft developments, or historical items. Both indoor and outdoor free-flight modeling developments are to be included. Please send proposed papers to:

Ray Harlan  
15 Happy Hollow Rd.  
Wayland MA 01778

Send title of proposed paper together with an abstract of 200 words, or more, or a complete paper if it is available. To be considered, abstracts should be submitted by Feb. 15, 1976.

AEROMODELLER Annual

The 1975-76 AEROMODELLER Annual has been published and has even more than usual to offer the indoor flier. Indoor plans include a Cat. I HLG, an FAI indoor model and a beginner PennyPlane; Dave Linstrum's "PennyPlane Pot-pourri" completes the indoor offering in definitive style. Whatever your modeling interests, this book helps keep you up to date on the broad range of aeromodeling all around the world.

FAI INDOOR REPORT

Hot Stuff! CIAM Proposals

The material immediately below is extremely time-critical in that AMA Hq. needs written inputs no later than Nov. 24, 1975. Note that FAI Indoor Committee is a normal channel for such communications, but that there is not time for that in this case. The information arrived at AMA Hq. Nov. 10, with the real deadline for return being the departure of the U.S. delegation to the CIAM. Therefore, feed pro or con opinions to Hq. immediately!

Indoor (U.S.) Definition of an official flight; substitute 60 seconds for 30 seconds in 1st and 2nd sentences of Sec. 3.4.4. Reason: experience has shown 30 sec. is too short a time to determine if model trim is OK; the change will eliminate wasted competition time and help all models realize their full potential.

Indoor (England) - Proposes provisional status for Easy B, with rules essentially the same as common U.S. practice.

Indoor (England) - Steering of Model - Change 3.4.7 to: To prevent a model from colliding with the structure of the building or its contents, or other models, a balloon (s) with its line attached, or a rod 2 to 8 meters in length, may be used to alter the course of the model, or to re-position it in another part of the flying space. There will be no time limit or restriction to the number of steering attempts, except that all steering shall be done from the front end of the model and never from behind.

During the steering the propeller may get caught by the line/balloon(s)/rod and stop revolving. As soon as the propeller stops, a 3rd watch should be used (preferably a double button watch, that records accumulative time) to determine the total of propeller stopped time, which is deducted from the running total shown on the other two watches. While the line is in actual contact with the model during steering, any attempt to pay out line (to artificially gain height) will disqualify that flight. If the steerer cannot disengage the propeller after steering, all 3 watches are to be stopped together, and the total prop-stopped time deducted as is detailed

above. No re-flight is allowed other than if fouled by another model, during steering. The decision to steer is the responsibility of the competitor, and must be done by him, other than for physically handicapped or poor sighted persons, who may nominate someone else to do it for him. It is the timekeeper's responsibility to observe the use of the steering equipment, and to warn the competitor if he is likely to endanger other models. If other models are fouled by the steerer, the fouled competitor has the choice of a substitute flight, which, if taken, is his score for that round.

General Procedures (Canada) Re: Voting at the Plenary Meeting. It is recommended that only countries with Teams at the previous World Championships in the class concerned be able to vote on technical subjects.

- - - - -CONTACT AMA HQ- - - - -

Program Wrapup

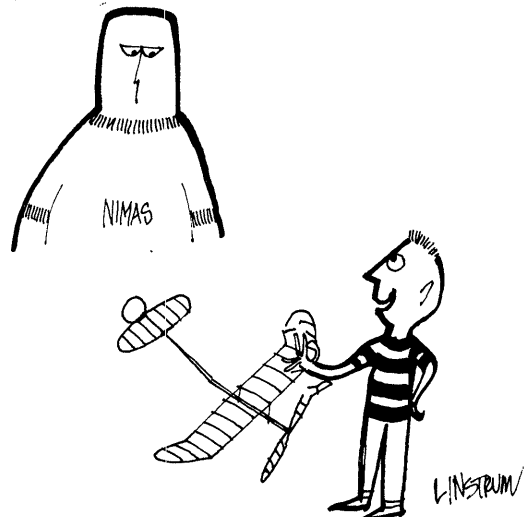
For better or worse, the 1975 Indoor Team Selection Finals are history. Very shortly, we will be asked to approve a new program which will select a Team to compete in the 1978 Indoor World Championships. The 1975 program was controversial, at least for some people. One might reflect on several prognostications and concerns of those who opposed the program; some of those concerns were:

1. "Cheap points" from lower ceiling sites and/or lower participation events.
2. Rich guys and airline pilots will keep flying until they get the points they need.
3. Fliers have to cross-zone fly to make it.
4. Regional points count too much at the Finals.
5. What if someone posts high time at the Finals but loses a team slot due to a low regional score?

So: no airline pilots made it, regardless of how many trips they made. Only Jim Richmond benefitted from a lot of cross-zone flying, and he would still have made the team without his "easy" Tulsa points (surely no one would consider his 300 points at Akron easy!). Two of the team made it after flying in only two meets in their own Zone. And, no one with only "easy" points (if there was such a thing!) came even close. No one with a high regional score "bumped" anyone off the team. In fact, the only bug-a-boo left really untested was #5 - and no one came even close. It could happen - maybe.

One "hindsight" concern has been expressed over the fact that someone in 15th place before the Finals made it on the team - they contend that if this is possible, the point system proves nothing. Let's put that in perspective! The Aug. '75 INAV listed point standings through 16th place - but the 16th place flier had almost 92% of a perfect score. If anyone is that close, placings are almost meaningless.

In other words, the only real problem with the 1975 program was that it was lots of work to compute points round-by-round. Perhaps that would be profitable to change; this writer can see no other reason to change!



"GEE, MISTER, THIS STUFF ISN'T AS STRONG AS MOM'S SARAN WRAP!"

# INDOOR

## NEWS and VIEWS

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

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

### New Members!

#### November

STEVEN R. BACOM, R.R. #2, 301 Burgoyne Rd., Port Orange, FL 32019

EDWIN GIFFORD, 57 Fern Rd., Bridgeton NJ 08302

NATHAN POLK, 320 S. Harrison St. Apt. 2k, E. Orange NJ 07018

R. REYNOLDS, P O Box 254, Hornell NY 14843

ROGER H. SEDRAN, 155 Kiwanis Dr., Wayne NJ 07470

#### December

Bill Dolack, 24 Crosby St., Springfield MA 01105

### Honorary Members

PER SODERSTEN, Slepneravagen 3, S-136 43 Handen, Sweden

### Family Memberships

STEVEN R. BACOM, Jr., R.R. #2, 301 Burgoyne Rd., Port Orange FL 32019

### Airship News

The Sept. '75 issue of AEROSPACE EDUCATION (official publication of NAA) contains a brief commentary on the current status of MAV's (Modern Airship Vehicles). Good-year, the only U. S. firm with extensive airship experience, has identified useful airship missions for NASA. Three missions recommended for further study are:

1. Short-haul VTOL rigid craft for passengers and cargo.
2. Short-haul heavy lifter for outsize military and commercial cargo.
3. Conventional heavy lifting, long-range rigid airships.

It is encouraging that airships continue to be considered in future transportation and cargo schemes. It may well be that airship docks will be more available in years to come, instead of being less so as present hangars wear out.

### '76 Nats - Where?

It has been announced that, subject to final confirmation by the Air Force, the 1976 Nats will be at Wright Field, adjacent to the Air Force Museum in Dayton, Ohio. At present, no site has been chosen for the Indoor Nats, but several have been investigated. One strong possibility is the the '76 Indoor Nats could follow immediately after the NIMAS Internats, if the NIMAS meet is conveniently scheduled for July 30-31, 1976.

Another Nats Indoor site possibility is the Univ. of Cincinnati Fieldhouse, used by the Southwest Ohio Free Flight Club for their indoor contests. Dan Domina has written, strongly expressing the desire to avoid a 600 mile round trip to West Baden. Please drop Dan a line to express support for his view, or try to convince him that a joint event would be better. Dan's address is 4701 Fox Run Dr., Plainsboro NJ 08536.

### NIMAS Internats

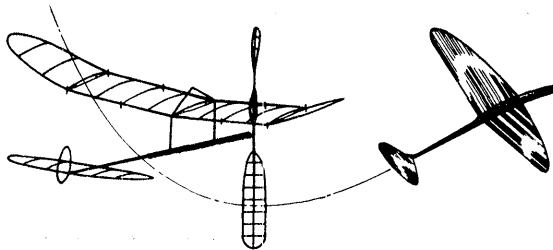
It has been suggested that (see above) the Indoor Nats be held in the Northwood Institute Atrium (West Baden), if this should be suitable with both the Nats Executive Committee and the management of Northwood Institute. Assuming that the Nats events were flown at West Baden, the present thinking supports this schedule for the NIMAS Internats:

Friday, July 30 - Fun Fly, original design competition.

Saturday, July 31 - Record Trials all day, with HLG flown in the morning and other events later. Also, the Saturday session could serve as Nats practice.

Saturday night - NIMAS banquet in the excellent Northwood facilities.

Please send your comments on the above schedule to



Stan Chilton, 1401-A S. Hydraulic, Wichita KS 67211. Be sure to include comments on whether the NIMAS Internats should be (essentially) combined with the Nats in this fashion, or whether you think the events should be separated in time and/or location from the Nats.

### FAI INDOOR REPORT

#### A Questionnaire Is Coming!

The FAI Indoor Committee is now working on a questionnaire to be sent to all participants in the 1975 Team Selection Program. The questionnaire will cover both details of the next program and certain items of budget concern which must also be approved by participant vote.

The questionnaire is being prepared by Bucky Servaites, who recently became Committee Chairman, replacing Erv Rodemsky. Questionnaire inputs came from concerns expressed by participants via their district Committee member, plus ideas and comments by Committee members.

### CONTEST CALENDAR

#### POSTAL MEET - Star Skippers

The Star Skippers, sponsored by Ed and Richard Whitten in New York, are organizing two indoor postal meets for NFFS and open to modelers everywhere through age fifteen. FLY PAPER runs Dec. '75-Jan. '76, and BAITED BREATH runs Mar./Apr. '76. The events can be flown under any ceiling under 50', and results will be fudged to 35'. Events are HLG, Class A ROG and H.L. Stick (all classes combined). For full contest rules, write for the Aug. '74 issue of STAR SKIPPER newsletter; write to: Star Skippers, P O Box 176, Wall St. Station, New York NY 10005.

#### CONNECTICUT - Glastonbury

Indoor sessions 7:30-9 pm at Glastonbury High Gym, Jan. 30, Feb. 20, Mar. 19, Apr. 13, May 11 and June 8, 1976. Sessions on Sunday, 8:30 am-1:30 pm, Jan. 11, Feb. 8, Mar. 14, Apr. 4 and May 2, 1975. George Armstead, 89 Harvest Lane, Glastonbury CT 06033, ph. 203-633-7836.

#### FLORIDA - Miami

Indoor Fly-Ins at Miami Dade North College, 9 am-2 pm, Jan. 11, Feb. 8, Mar. 7, Apr. 11 and May 9, 1976. Indoor contests at Goodyear Hangar, Opa Locka Airport, 9 am-5 pm, Dec. 28, 1975 and Jan. 25, Feb. 22, Mar. 21, Apr. 25 and May 23, 1976. Confirm hangar dates by calling 858-6363. Dr. John Martin, 3227 Darwin St., Miami FL 33133.

#### ILLINOIS - Chicago

Delta Dart and 90 Minute Glider (90 min. to build HLG from scratch) contest set for Dec. 28, 1975, at Glenview NAS Drill Hall, Glenview Ill. Otto Gurth, 2107 Center Ave., Northbrook IL 60060.

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

Indoor sessions at DuPont Gymnasium, (Vassar St. and Mass. Ave., Cambridge MA; use Vassar St. entrance), Jan. 17, Feb. 14, Mar. 20 and Apr. 17, 1976, 6 pm-10 pm. Contest May 8, 1976, 10 am-8 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland MA 01778, ph. 617-358-4013.

#### NEW JERSEY - Livingston

The Union Model Airplane Club is again sponsoring indoor sessions at the Livingston School Gym & Auditorium. 7 pm-10 pm, Jan. 8, Feb. 12, Mar. 11, Apr. 8 and May 13, 1976. Dan Domina, 4701 Fox Run Dr., Plainsboro NJ 08536.

#### NEW YORK - Long Island

Cat. I Record Trials at Friends Academy, Locust Valley on Sat. Jan. 3 and Sat. Apr. 3, 1976.

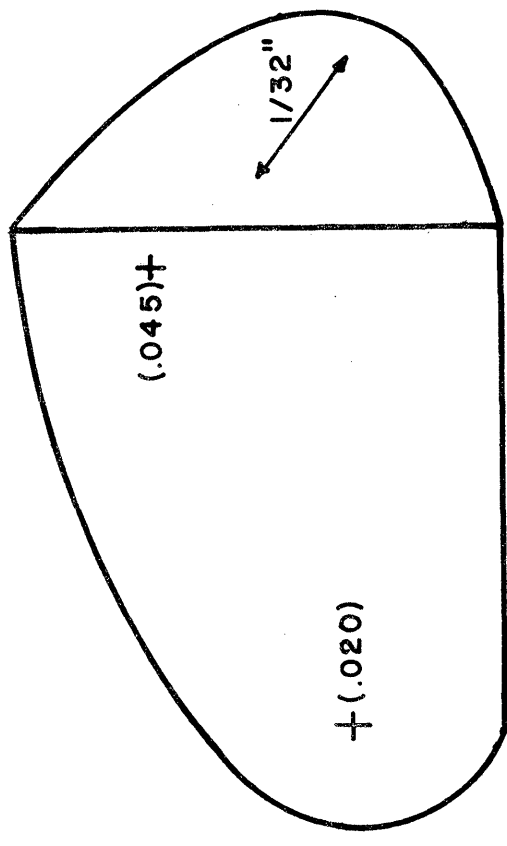
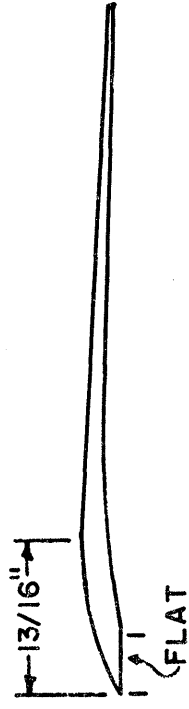
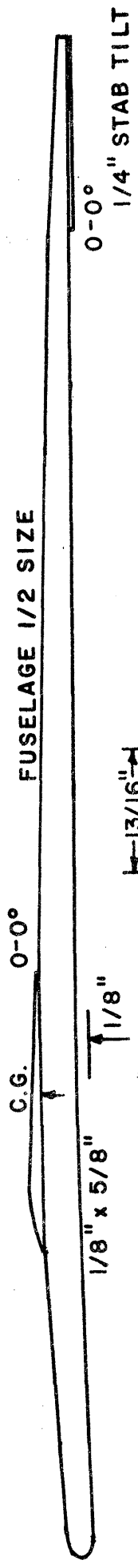
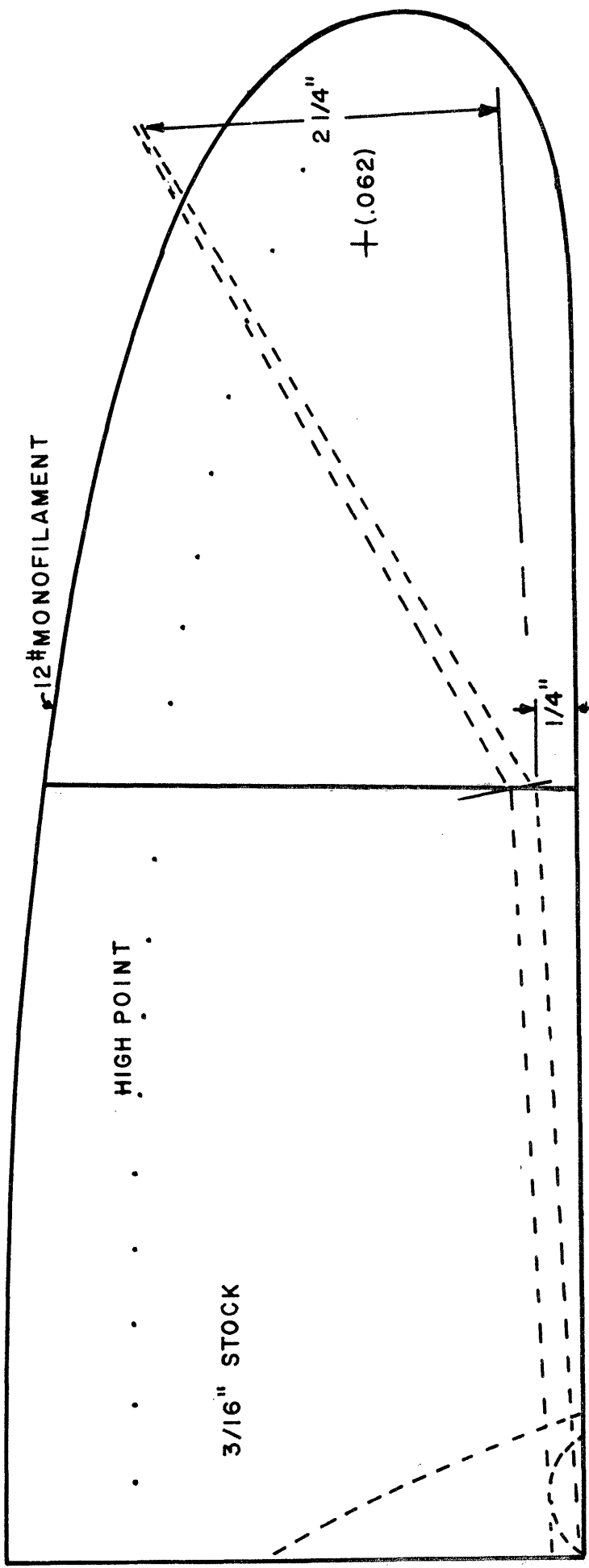
Cat. II contest at Cantiaque Park, Hicksville, Sunday, Apr. 11, 1976.

Cat. I contest at Nassau County Arena, Long Beach, Sunday, June 6, 1976.

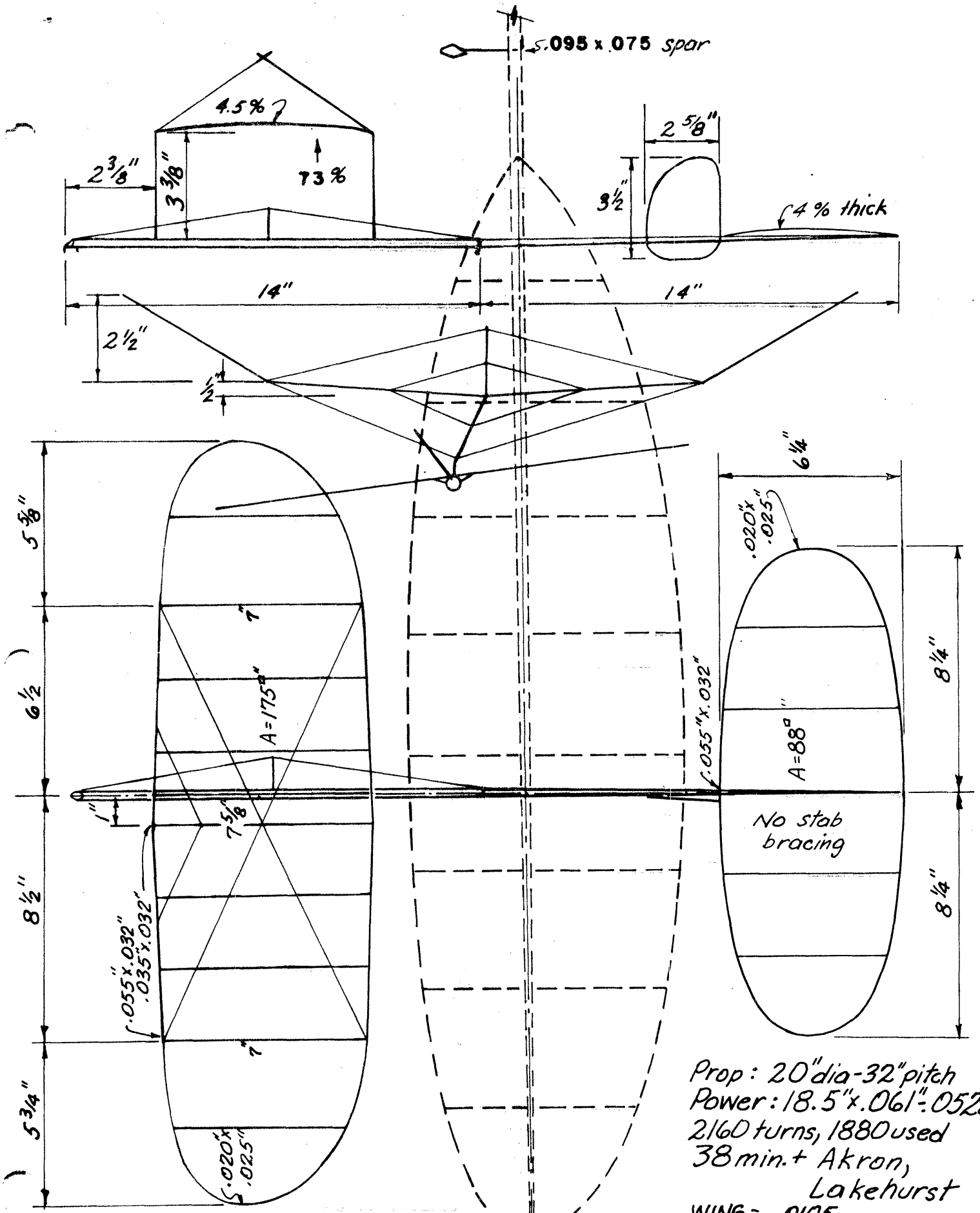
Contact Jean Pailat, 30 Emerson Rd., Brookville, Glen Head NY 11545.

#### OKLAHOMA - Oklahoma City

A series of indoor contests are being held at an Armory, 200 NE 23rd St., Oklahoma City, 8 am-5 pm, with HLG, Peanut Scale and Easy B. Advance notice has typically been only one week, so drop a line to Matt Gawain, 9710 NE 3rd Place, Midwest City OK to get on the mailing list. Good site, 35' to beams with 200' x 300' floor area.



CAT. II HLG  
 2nd Open-'75 Nats  
 Basic Design - Dennis Kargol, 1965  
 Modified - Chuck Markos, 1975  
 Weight - 12.7 g., Left-Left Pattern



1975 FAI BUCKY SERVAITES

Prop: 20" dia-32" pitch  
 Power: 18.5" x .061" = .052oz.  
 2160 turns, 1880 used  
 38 min. + Akron,  
 Lakehurst

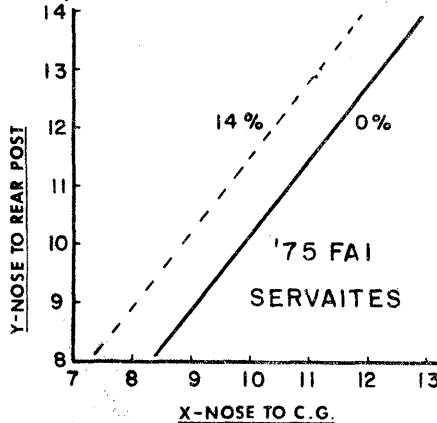
WING = .0105  
 PROP = .0065  
 REST = .0190  
 Total = .036 oz.

**STATE OF THE ART**

The page 2 plan is of Bucky Servaites' 1975 FAI design which carried him through the toughest ever team selection program just finished. Bucky's score for the program was 1495 points, just .3% short of a perfect score. Of the model Bucky says:

The wing outline and fuselage length are essentially the same as used in the previous program. The stab has been enlarged to 50%, the nose moment shortened and the rudder reshaped to fit the new box. Other changes have been made, but they are of a detail nature to strengthen the model and make it more reliable. I adopted a new rear hook design suggested by Dick Kowalski; the previous hook was a major cause of stick crushing and failure on hookup. Ray Harlan's "O" rings have also helped ease the hookup problems and I don't think I could operate properly without them now. Solid compression ribs of .042" constant depth are used in place of built-up ones to reduce buckling and sudden failure due to high launch loads. In conjunction with this, the offset wing posts are used to equalize the inboard wing panels and more evenly distribute the rib loading. Previously the ribs on the left inboard panel would balloon to what seemed like an inch or two on launch.

Bucky flew the model with static margin set at +14% figured by the CMOS method, or +19% when computed by the INP method. As a reminder, most models are balanced about +5% (CMOS), and Hal Crane's recommendation was +10% when INP is used. In view of the turbulent conditions during the Finals, this forward trim doubtless was beneficial.



The plan on page 3 is by Chuck Markos, and with this design he placed 2nd in Open HLG at the '75 Nats, with a time of 97.2 sec. He described the glider:

It has been a consistent winner in the Chicago area, especially in the hands of Bob Watson. It has several Nats places and trophies to its credit. The "modifications" mentioned on the plan consisted of adding a bit of dihedral and undercamber. The original wing center section was flat, and the undercamber was increased from 3/64" to almost 3/32" (1/32" in tip panels). Bob Watson tells me the design has done 65 seconds in the 75' Madison Street Armory.

I flew the model in a left-left pattern (I am right-handed) for two reasons. First was to make the pattern more compact in order to miss the scoreboard at the Lake Charles Civic Center. Second, this type of launch loads the wing less than the traditional right-left pattern. For higher ceilings than the 55' Civic Center, increase the weight by 1 1/2 grams for each 10' and reduce the undercamber to about 3/64".

**CONTEST RESULTS**

**EUCLID INDOOR CONTEST, May 17-18, 1975**

<b>Jr.-Sr. Peanut Scale</b>		<b>Open Jetco ROG</b>	
1. Chris Clemens	3	1. Robert Masters	2:29
2. Mark Rader	5	2. Robert Mullins	2:09
3. Rich Hucovsky	6	3. Marge Weisenbach	1:37
4. Mark Taverna	6	4. Joe Skraha	1:31
		5. Vern Hacker	1:22
<b>Jr.-Sr. Jetco ROG</b>		<b>Scraps</b>	
1. Tom Mzik	1:47	1. Vern Hacker	4:01
2. Paul Masters	1:34	2. Warren Weisenbach	3:51
3. Joe Mekina	1:30.2	3. Joe Sova	3:48
4. Joe Skroha	1:30.2	4. Gordon Roberts	3:00
5. Norm Getzlaff	0:59	5. Norm Getzlaff	2:43
<b>Jr. Easy B</b>		<b>Open Easy B</b>	
1. Tom Mzik	4:31	1. Robert Mullins	7:58
2. Paul Masters	4:25	2. Bob Clemens	7:31

3. Mark Rader	3:53	3. Gerald Skrjanc	7:13
4. Amy Hancy	3:16	4. Larry Mzik	7:07
5. Michael Avins	2:24	5. Bernon Hacker	

**Delta Dart**

1. David Hyka	24
2. Norm Getzlaff	21
3. Lou Vogel	18
4. Cindy Midkiff	18
5. Richie Riffle	18

**Sr. Easy B**

1. Chris Clemens	5:35
2. Joe Mekina	5:09
3. Joe Skraha	4:18
4. Rich Hucovsky	0:12

**Indoor Scale**

1. Gerald Skrjanc	144
2. Bob Clemens	129
3. Robert Masters	104
4. Mike Midkiff	95
5. Richie Riffle	64

**Peanut Scale**

1. Gordon Roberts	7
2. Warren Weisenbach	10
3. Mike Midkiff	10
4. Robert Masters	12
5. Mike Midkiff	12

**Sr.-Open HLG**

1. Gerald Skrjanc	57.9
2. Rudy Kluber	56.2
3. Norm Getzlaff	47.1
4. Robert Mullins	39.3
5. Joe Skraha	37.2

**M.I.A.M.A. Indoor Contest #8, May 25, 1975, Miami, Florida**  
Goodyear Hangar, Opa Locka Airport

**Jr.-Sr. HLG**

1. John Arthur, Jr.	49.3
2. A. Honey	10.3

**Jr.-Sr. PennyPlane**

1. Allen Honey	5:39
2. Charles Slater	3:05.2
3. Cliff McCallum	0:47.0

**Jr.-Sr. Easy B**

1. Charles Slater	9:02
2. Allen Honey	3:28
3. John Arthur, Jr.	0:33.8

**Jr.-Sr. Scale**

1. Charles Slater	
2. Kevin Smith	
3. Cliff McCallum	

**Chicago Aeronauts Fall Indoor Contest, Nov. 9, 1975**  
Madison St. Armory, Cat. II, 75' ceiling.

**HLG Junior**

1. Bill Schuh	83.0
2. Dick Jones	59.8
3. Greg Miller	53.6
4. Mario Moranetz	21.2

**HLG Open**

1. Bob Larsh	119.4
2. Chuck Markos	116.6
3. Bob Watson	112.6
4. Wally Stammers	65.4

**Open PennyPlane**

1. Steve Brown	9:43.0
2. Dennis Jaecks	9:15.0
3. Robert Hayes	8:59.0
4. Bob Larsh	7:48.0
5. Joe Fierce	7:05.0
6. Otto Curth	6:48.4
7. Gordy Wisniewski	15:11.0

**Jr.-Sr. Paper Stick**

1. Dan Brown	14:40.0
2. Keith Gordy	10:50.2

**Walnut Scale**

1. Bob Clemens	1:15
2. Emerson Elwell	89
3. Dennis Norman	70
4. Rich Hucovsky	66
5. Gordon Roberts	62

**Jr.-Sr. Paper Stick**

1. Chris Clemens	7:27
2. Joe Mekina	6:09.9
3. Joe Skraha	4:58
4. Paul Masters	3:15
5. Michael Fox	2:00.3

**Open Paper Stick**

1. Vernon Hacker	8:15
2. Gerald Skrjanc	7:52.2
3. Bob Clemens	7:20.7
4. Warren Weisenbach	7:19
5. Norm Getzlaff	6:48.5

**Indoor Stick**

1. Vernon Hacker	11:13
2. Dale Hacker	7:21
3. Gerald Skrjanc	6:53
4. Ted Katsanis	6:43
5. Joe Mekina	5:29

**Jr. HLG**

1. Norm Getzlaff	26.4
2. Paul Masters	16.8

**Sr.-Open FAI Stick**

1. Vernon Hacker	10:40
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**Open HLG**

1. John Arthur	82.7
2. Jim Whelan	64.0
3. Jim Stewart	56.0

**Open PennyPlane**

1. Jim Stewart	6:48.8
2. Jim Whelan	1:25
3. Fred McCallum	1:17

**Open Easy B**

1. Roman Szymula	8:27
2. Jim Stewart	8:11
3. John Martin	6:02.2

**Open Scale**

1. John Martin	
2. Dan Kilgore	
3. Jim Stewart	

**MERRY CHRISTMAS & HAPPY NEW YEAR**

By now, it is obvious to me that I won't get another issue out before Christmas, hence the wish of good cheer above. Of all the activity which has been curtailed, I miss the correspondence most. So, it is very pleasant to receive your cards and greetings - thank you very much!

# INDOOR

## NEWS and VIEWS

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

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

### Special International Issue

Once again, the November issue is dedicated to all indoor fliers outside the North American continent. These friends all around the world, who often work against hardships to fly, provide greater incentive for our own efforts. No new three-views were made available from these many countries, but "News From Around The World" has been revived for this issue. We hope you enjoy the news and contest results presented there.

### Dick Black Memorials

A long time ago, a very fine fellow named Dick Black helped with NIMAS and was later very active in forming the National Free Flight Society. Both NFFS and NIMAS took steps to commemorate Dick after his death, and the NIMAS memorial was to be slide-tape lectures on various aspects of indoor flying. A few of these exist, and it would be nice if more of them could be made to help the many new fliers and clubs find out what it is all about. Here is how you can help: as you build, or fly, or do any particular activity associated with flying indoor models, please shoot some color slides. These can be combined in many different ways to make instructional programs for club and individual use. At least two fliers have promised copies of existing slides, so with more help these lectures can be improved and expanded.

### Financial Report

This issue begins the 15th year of publication of INDOOR NEWS AND VIEWS. Perhaps it would be more accurate to say the 15th group of newsletters, since this one is about 8 weeks late! The State of the Society is this:

Membership grew by 9% to an average circulation of 385 and a peak circulation of 399 for the Oct. '75 issue. A great number of requests for sample copies and information await answering; if the tardy reply doesn't turn off the requestors, circulation could top 425 average in '76. The yearly expense breakdown is as follows:

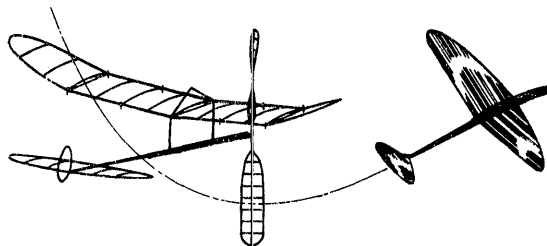
Printing costs (INAV only)	\$479.86
INAV postage	489.20
Correspondence postage	21.87
Office supply, other expense	204.17
	1195.59

Since income rising to \$1320.90, there is a surplus of \$125.80. In comparing costs from last year, almost half of the surplus would have been used up if outgoing mail had been at normal volume.

In view of the recent postal rate increase, the annual angonizing reappraisal of expenses/projected income was made. Surprisingly, the indication is that, with the '75 surplus, and figuring 10% growth plus inflated costs, 1976 projects to be break-even. That assumes that printing and postal rates do not increase; if either happens, there may be a mid-year increase. However, for the present, rates will remain the same, except that those few who request air mail delivery (certain remote countries) will find the air mail surcharge increased from 8¢ per issue to 13¢ per issue to exactly reflect the rate increase. For those who have been wondering:

NIMAS membership (includes INAV)	\$3.50
Subscription only	2.50
(above rates include Canada and Mexico)	
Foreign subscription (surface mail)	\$3.50
(air mail)	5.06

I want to finish the report with another word of thanks for the patience of all INAV readers; besides not complaining, many people have continued to write news and contest schedules and results. We still need new HLG plans, hints etc.; construction ideas and any similar kind of material. How about some more PennyPlane and Easy B designs? Fun models?



### FAI INDOOR REPORT

#### Report From CIAM

Two actions at the Dec. '75 CIAM meeting will affect indoor flying. First, in the definition of an official flight, the minimum time is changed from 30 seconds to 60 seconds. Second, rule 3.4.7, Steering of Model, was replaced by the following:

To prevent a model from colliding with the structure of the building or its contents, or other models, a balloon(s) with its line attached, or a rod 2 to 8 metres in length, may be used to alter the course of the model, or to reposition it in another part of the flying space. There will be no time limit or restriction to the number of steering attempts, except that all steering shall be done from the front end of the model and never from behind.

During the steering the propeller may get caught by the line/balloon(s)/rod and stop revolving. As soon as the propeller stops, a 3rd watch should be used (preferably a double button watch, that records accumulative time) to determine the total of propeller stopped time, which is deducted from the running total shown on the other two watches. While the line is in actual contact during the steering, any attempt to pay out line (to artificially gain height) will disqualify that flight.

If the steerer cannot disengage the propeller after steering, all watches are to be stopped together and the total propstopped time deducted as is detailed above. No re-flight is allowed other than if fouled by another model during steering. The decision to steer is the responsibility of the competitor, and must be done by him, other than for physically handicapped or poor sighted persons, who may nominate someone else to do it for him. It is the timekeepers responsibility to observe the use of the steering equipment, and to warn the competitor if he is likely to endanger other models. If other models are fouled by the steerer, the fouled competitor has the choice of a substitute flight, which, if taken, is his score for that round.

#### Indoor WCh Scheduled

The 1976 Indoor World Championships will be held at Cardington in mid-August.

#### New Team Manager Coming?

Erv Rodemsky was unable to obtain a definite commitment on sufficient vacation time when he needed it to be team manager. He has resigned and a new team manager is being elected at this time.

### CONTEST CALENDAR

#### POSTAL MEET - Star Skippers

The Star Skippers, sponsored by Ed and Richard Whitten in New York, are organizing two indoor postal meets for NFFS and open to modelers everywhere through age fifteen. FLY PAPER runs Dec. '75-Jan. '76, and BAITED BREATH runs Mar./Apr. '76. The events can be flown under any ceiling under 50', and results will be fudged to 35'. Events are HLG, Class A ROG and H.L. Stick (all classes combined). For full contest rules, write for the Aug. '74 issue of STAR SKIPPERS newsletter; write to: Star Skippers, P O Box 176, Wall St. Station, New York NY 10005.

#### COLORADO - Denver Area

The Martin Model Masters have scheduled meets at Hinkley High School Gym in Aurora, Colorado on Jan. 25 and Feb. 15, 1976, and a meet Mar. 7, 1976 at a site to be announced. For details contact Ted Gonzoph, 12996 E. 2nd Ave., Aurora CO 80011, ph. 303-364-1854.

#### CONNECTICUT - Glastonbury

Indoor sessions 7:30-9 pm at Glastonbury High Gym, Jan. 30, Feb. 20, Mar. 19, Apr. 13, May 11 and June 8, 1976. Sessions on Sunday, 8:30 am-1:30 pm, Jan. 11, Feb. 8, Mar. 14, Apr. 4 and May 2, 1975. George Armstead, 89 Harvest Lane, Glastonbury CT 06033, ph. 203-633-7836.

## FLORIDA - Miami

Indoor Fly-Ins at Miami Dade North College, 9 am-2 pm, Jan. 11, Feb. 8, Mar. 7, Apr. 11 and May 9, 1976. Indoor contests at Goodyear Hangar, Opa Locka Airport, 9 am-5 pm, Dec. 28, 1975 and Jan. 25, Feb. 22, Mar. 21, Apr. 25 and May 23, 1976. Confirm hangar dates by calling 858-6363. Dr. John Martin, 3227 Darwin St., Miami FL 33133.

## ILLINOIS - Chicago

The Illinois Model Aero Club will hold a meet at Madison St. Armory in Chicago on Feb. 8, 1976 with Paper Stick, PennyPlane and Peanut Scale. CD: Don Lockwood, 10543 S. Hamilton, Chicago IL.

## MASSACHUSETTS - M.I.T.

Indoor sessions at DuPont Gymnasium, (Vassar St. and Mass. Ave., Cambridge MA; use Vassar St. entrance), Jan. 17, Feb. 14, Mar. 20 and Apr. 17, 1976, 6 pm-10 pm. Contest May 8, 1976, 10 am-8 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland MA 01778, ph. 617-358-4013.

## NEW JERSEY - Livingston

The Union Model Airplane Club is again sponsoring indoor sessions at the Livingston School Gym & Auditorium, 7 pm-10 pm, Jan. 8, Feb. 12, Mar. 11, Apr. 8 and May 13, 1976. Dan Domina, 4701 Fox Run Dr., Plainsboro NJ 08536.

## NEW YORK - Long Island

Cat. I Record Trials at Friends Academy, Locust Valley on Sat. Jan. 3 and Sat. Apr. 3, 1976.

Cat. II contest at Cantiaque Park, Hicksville, Sunday, Apr. 11, 1976.

Cat. I contest at Nassau County Arena, Long Beach, Sunday, June 6, 1976.

Contact Jean Paillet, 30 Emerson Rd., Brookville, Glen Head NY 11545.

## OKLAHOMA - Oklahoma City

Indoor contests Jan. 25 and Feb. 22, 1976 at a National Guard Armory, 200 NE 23rd St., Oklahoma City. Events: HLG, Easy B, Peanut Scale on Jan. 25; add PennyPlane on Feb. 22. Matt Gewain, 9710 NE 3rd Place, Midwest City, Oklahoma, ph. 405-737-4972 or 405-737-1085. Long distance travelers check on site status just in case.

## OREGON - Albany

Indoor contests Jan. 25 and Feb. 22, 1976, 9:30 am to 3:30 pm, at South Albany High School Gym, 3705 S. Columbus St., Albany. Jan. 25 - PennyPlane, Easy B, HLG, R-T-F's, Earle Moorhead. Feb. 22 - AMA Scale, Unmodified Kit Peanut, Open Peanut, Popularity Scale, Keyhole Scale, Old Timer. Bob Stalick, 1120 Shady Lane, Albany OR 97321, ph. 928-8101.

## TEXAS - Dallas/Ft. Worth

Indoor session and record trials at Dallas Naval Air Station in Grand Prairie, Texas, 1 pm -3:45 pm, on Jan. 25 and Feb. 8, 1976. NOTE: if you plan to attend, give your name to Ed Turner, 3544 Granada Dr., Ft. Worth TX 76118, ph. 817-589-1519, at least a week in advance. This will be necessary for gate security at Dallas NAS.

### RECORDS? MAYBE!

Indoor Record Trials, Jan. 3, 1976 CAT I AMA Friends Academy, Locust Valley, LI, NY, 33' ceiling  
Jr. PennyPlane - 0:52.0, Greg Trubowitsch  
Sr. PennyPlane - 5:28.8, Richard Whitten  
Open PennyPlane - 4:28.4, Ron Williams  
Sr. Ornithopter - 1:12.6, Richard Whitten

### DESIGN FOOTNOTES

This column explores various ideas and concepts which may or may not have actually been put into practice. As such, it is intended to be a stimulant for the imagination and a spur to further model design experimentation. If you have such an idea, speculative or reduced to practice, please share it. This particular offering is the result of brainstorming after it was announced that Easy B would become an official event of drastically changed character from our old friend. Fortunately, the proposal did not pass and Easy B remains a provisional event.

### THE NEW B

by Ron Williams

Dear Bud;

Enclosed is a drawing for an Easy B by the new can-of-worms rule. The rule is like a chess-players joke in that you have to know the game (or the old rule) to get the fun of it.

The New B is based loosely on John Kukon's Penny bipe which has been consistently flying over 15 minutes in Cat. III spaces. At 1.5 grams, 25 minutes can't be far off for New B.

I hope there will be contest directors who'll see fit to include an event for old Easy B. It was truly a beginner's event in that one could build a klunker, fly it against the best and possess a "yardstick" for comparison. With my "B" in my hand and Pete Andrew's ship sitting before me, I could start with the differences I could see. Where does one begin now?

### NEWS FROM AROUND THE WORLD

#### ARGENTINA

According to the most recent reports from Buenos Aires, the FAI Cat. I records in Argentina are the 16:49 flight set by Eduardo Grippo; this was then surpassed by Nereo Beggiano with 17:15. Apparently they also have an active program for youth, emphasizing models similar to Easy B or PennyPlane. No details of these models were revealed.

#### AUSTRALIA

Although the results have not been received, the Australian Nats were scheduled for Dec. 31, 1975. The top placing fliers will be offered FAI team berths.

#### WESTERN AUSTRALIA

A report from Fred Tower in Roleystone indicated that indoor modeling is beginning with flying in school gyms with ceilings about 20'. For the most part, models are built from outdoor wood, with the only specialty supplies being imported. Peanut Scale, Scale, Easy B, Paper Stick and Stick models are flown, but spans are generally limited to 20". Typical times are 4 minutes for models similar to Tom Vallee's Bandersnap, 3:40 for Easy B (20' ceiling) and 20 seconds in 14' ceiling for HLG. Easy B and HLG will be added to State Championship meets if they prove to be popular enough.

#### CZECHOSLOVAKIA

An international indoor meet was held in the big exhibition hall in Brno on July 12-13, 1975. This hall has exceptionally large floor area and 135' ceiling. However, a 25' diameter ventilator in the top restricts the maximum safe altitude to about 25' below the top. As a result it requires very special trim and very capable models to do top time. In the results below, note that Laurie Barr of England attended this meet!

1. J. Kalina	Czech	34:39	32:15	66:54
2. E. Ciapala	Poland	34:10	30:18	64:28
3. E. Chlubny	Czech	31:02	31:26	63:28
4. R. Czechowski	Poland	29:14	30:16	59:30
5. A. Valenta	Czech	28:55	30:20	59:15
6. A. Pespichal	Czech	29:16	29:00	58:16
7. L. Barr	England	25:22	31:55	57:17
8. L. Kouty	Czech	27:55	28:02	55:57
9. L. Schramm	Poland	29:05	25:49	54:54
10. S. Bombol	Poland	25:19	29:18	54:37
11. J. Jirasky	Czech	21:24	30:46	52:10
12. D. Sedlar	Czech	29:35	22:01	51:36
13. P. Bor	Czech	17:44	32:18	50:02
14. S. Sykera	Czech	28:21	21:22	49:43
15. K. Rybecky	Czech	19:08	21:12	48:20

#### ENGLAND

Judging from reports in FREE FLIGHT NEWS, Cardington has seen considerable activity during 1975. An open competition May 18 yielded top two-flight totals of 58:01, 54:35 and 54:12 by Laurie Barr, Ron Green and Reg Parham, respectively. Two major competitions were the Indoor Nats and the Team Selection competition, with results as listed below. Note in particular Bob Bailey's winning Easy B flight and the performances listed by Jiri Kalina, who visited the shed to try for the World Record. His times, while not reaching his goal, have been adopted by the British as marks to strive for.

#### Indoor Nats, July 5-6, 1975

##### Easy B

1. R. Bailey	St. Albans	16:46	17:34	34:20
2. J. Blount	Croydon	16:10	16:41	32:51
3. A. Barr	Hayes	15:01	16:13	31:14
4. L. Barr	Hayes	15:25	15:30	30:55
5. R. Melville	St. Albans	14:15	15:21	29:36
6. J. Tipper	Lee Bees	12:58	13:36	26:34

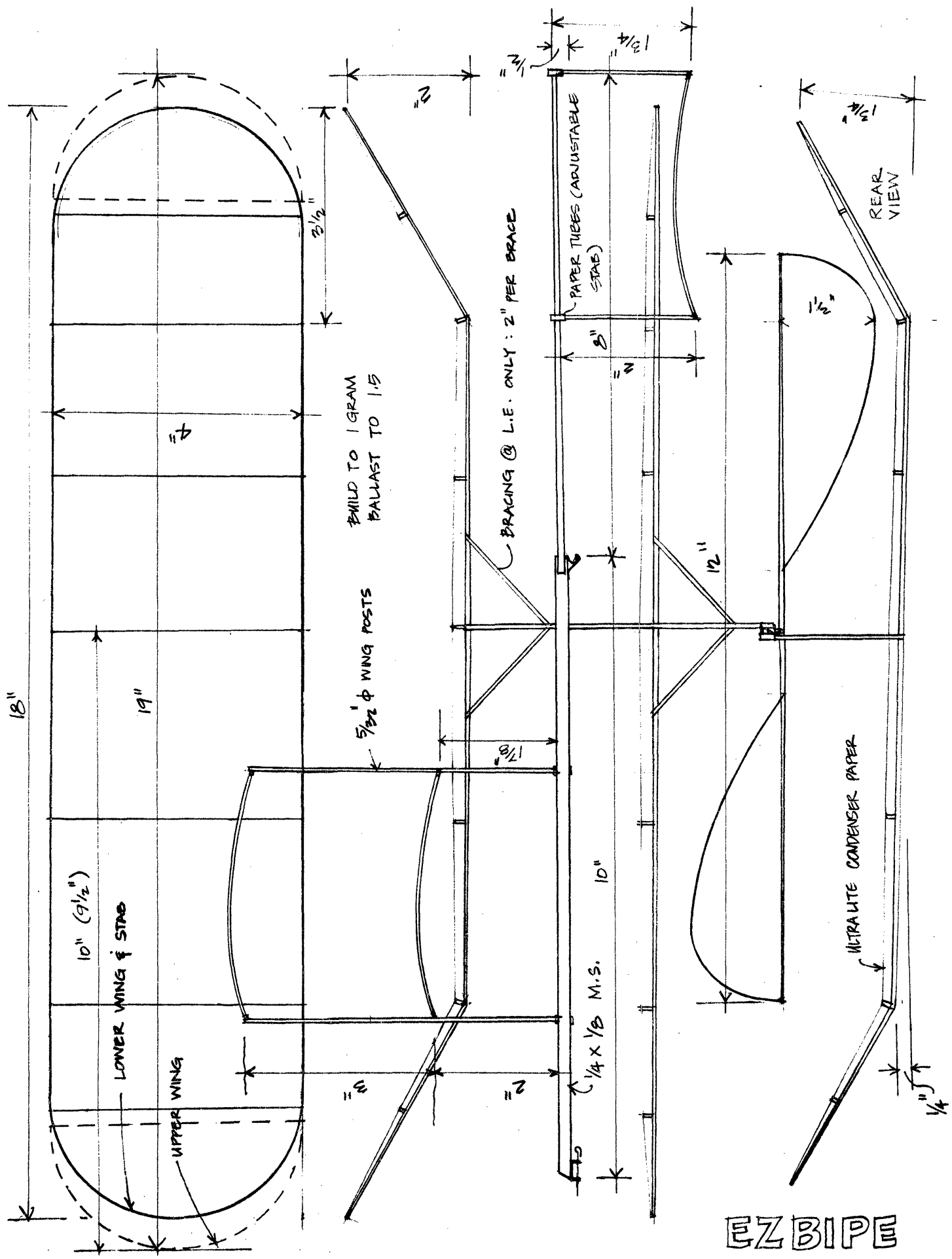
##### PennyPlane

1. R. Parham	Worcester	9:37	10:48	20:25
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##### FAI Stick

1. L. Barr	Hayes	30:47	31:19	62:06
2. R. Green	St. Albans	33:35	28:26	61:44
3. J. Blount	Croydon	30:05	31:13	61:18
4. P. Masterman	Norwich	29:00	31:13	60:13
5. G. Lefever	Norwich	28:28	28:39	57:07





**EZBIPE**  
 RON WILLIAMS

Open Stick

1. J. Blount	Croydon	10:55	17:45	28:00
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HLG

1. D. Greaves	Birmingham	59.0	59.0	118
2. P. Bayram	Richmond	58.8	59.0	117.8
3. M. Shepherd	St. Albans	56.2	57.5	113.7
4. J. Hopper	Stansted	52.0	53.0	105.0
J. Tipper	Lee Bees	51.0	54.	105.0

Team Trials, Sept. 20-21, 1975

1. L. Barr	Hayes	32:57	34:04	67:01
2. J. Blount	Croydon	32:52	31:47	64:39
3. R. Green	St. Albans	29:10	34:14	63:24
4. G. Lefever	Norwich	30:09	31:56	63:05
5. R. Bailey	St. Albans	31:50	28:07	59:57
6. D. Morely	Grantham	27:15	29:38	56:53
7. R. Parham	Worcester	26:40	29:07	55:47
8. M. Shepherd	St. Albans	25:19	27:27	52:46
9. B. Edwards	Birmingham	25:20	25:08	50:28
J. Kalina (record attempts)		40:11	38:12	(73:51)

HOLLAND

Indoor fliers in Holland have been allowed reasonably frequent access to the KLM 747 hangar at Schiphol Airport, which they feel will greatly improve their team performance at future WCh's. Judging from photos, the hangar is a twin of the American Airlines hangar at Tulsa, which proved to be a very good site. Also, some model publications have carried articles on indoor modeling, which is helpful in training new fliers.

ITALY

An 8 m hall in Rimini was the site of a late 1974 meet for FAI Stick and PennyPlane. There have been no later reports, but perhaps reports of their team selection will come soon.

FAI Stick

1. C. Cotugno	Rome	11:29	11:05	22:34
2. G. Masciullo	Rome	11:28	9:42	21:10
3. P. Migani	Rimini	7:40	12:45	20:25
4. G. Federici	Rome	10:09	9:56	20:05
5. A. Frioli	Rimini	9:26	9:40	19:06
6. F. Migani	Rimini	7:35	9:50	17:25
7. N. Sighelle	Bologna	5:43	5:38	11:21

PennyPlane (best single flight of six)

1. N. Sighelle	Bologna	(4:29)	5:01
2. P. Migani	Rimini	(3:50)	5:01
3. A. Vittori	Rome		4:01
4. A. Seghettini	Rimini		3:45
5. P. Vittori	Rome		3:33
6. Q. Cecchetti	Rimini		3:20
7. C. Cecchetti	Rimini		3:06
8. P. Seghettini	Rimini		2:11

NEW ZEALAND

Indoor fliers in Auckland report their site is 30' x 60' with 20' ceiling, with Stick, Easy B and HLG type models being flown. As is common with many places in the world, good indoor supplies are difficult to obtain.

POLAND

At least two major meets were held in Wroclaw, both at the same site and on the same weekend. Apparently, rounds were combined, and for Polish fliers, each flight counted for both events.

National Polish Championships, June 13-15, 1975Open FAI Stick

1. E. Ciapala	Slaski	31:57	31:48	63:45
2. R. Czechowski	Krakow	30:00	28:19	58:19
3. S. Bombol	Wroclaw	29:26	27:27	56:53
4. S. Kujawa	Poznan	28:28	28:18	56:46
5. Z. Szymanski	Wroclaw	25:20	27:52	53:12
6. S. Sierko	Bydgoszcz	26:24	26:23	52:47
7. J. Kapusniak	Bydgoszcz	23:17	23:03	46:20
8. R. Niedzielski	Swidnik	18:41	19:05	37:46
9. M. Czajka	Grudziadz	13:24	11:55	25:19

Junior FAI Stick

1. P. Frackowiak	Wroclaw	24:33	24:32	49:05
2. S. Garlicki	Krakow	24:45	23:33	48:18
3. D. Jaszczak	Wroclaw	16:28	17:55	34:23
4. J. Rygielski	Bydgoszcz	17:35	16:17	33:52
5. J. Zioba	Wroclaw	17:05	16:13	33:18
6. J. Jablonski	Bydgoszcz	14:32	16:49	31:21
7. W. Pawlisz	Bydgoszcz	10:20	18:29	28:49
8. M. Witkowski	Bydgoszcz	9:19	11:14	21:04
9. J. Landowski	Bydgoszcz	11:00	6:37	17:37
10. H. Dembek	Bydgoszcz	6:47	4:20	11:07

International Indoor Championships, June 13-15, 1975

1. J. Kalina	Czech	31:22	32:26	63:48
2. E. Ciapala	Poland 1	31:57	31:48	63:45
3. E. Chlubny	Czech	30:22	28:19	61:34
4. R. Czechowski	Poland 1	30:00	28:19	58:19
5. S. Bombol	Poland 2	29:26	27:27	56:53
6. S. Kujawa	Poland 1	28:28	28:18	56:46
7. A. Valenta	Czech	27:14	29:14	56:28
8. S. Sierko	Poland 2	26:24	26:23	52:47
9. L. Schramm	DDR	22:46	23:51	46:37
10. J. Kapusniak	Poland 2	23:17	23:03	46:20

ROMANIA

Two contests in the salt mine were reported for 1975, the Romanian Nats and an International meet. In a brief commentary, Aurel Popa noted that the only time really wild conditions occurred in the mine were during the 1970 WCh, when many extra lights and heaters were introduced into the mine. During the '75 Nats, the only hangups came from climbing too fast and landing on an upper balcony. Romania still hopes to host another WCh, and their fliers continue to monitor conditions in the mine toward making better arrangements.

Romanian Indoor Championships, Feb. 21-23, 1975FAI Stick

1. Aurel Popa		35:34	34:43	70:17
2. Eugen Holtier		32:54	33:55	66:49
3. Otto Hints		33:36	31:23	64:59
4. Aurel Moraru		31:40	31:42	63:22
5. Daniel Frokanu		29:58	31:51	61:49
6. Tudorel Lungu		26:54	29:59	60:27
7. Vasile Nicocara		29:02	30:15	59:17
8. Nicu Bezman		29:15	28:43	57:58
9. Firel Stawate		27:53	28:45	56:38
10. Gheorghe Dumitrenco		28:16	27:39	55:55

International Indoor Contest, May 9-10, 1975

1. S. Kujawa	Poland	34:56	35:01	69:59
2. A. Popa	Romania	32:17	34:05	66:22
3. E. Chlubny	Czech	32:08	32:51	64:59
4. J. Kalina	Czech	32:29	32:17	64:46
5. C. Czechowski	Poland	32:05	32:39	64:44
6. E. Ciapala	Poland	31:12	31:14	62:26
7. A. Ree	Hungary	30:46	31:32	62:18
8. E. Holtier	Romania	31:20	29:15	60:35
9. G. Buzady	Hungary	29:06	31:03	60:09
10. O. Hints	Romania	28:08	31:45	59:53
11. A. Egri	Hungary	29:57	29:46	59:43
12. A. Moraru	Romania	30:15	28:50	59:05
13. P. Bombol	Poland	27:36	24:53	52:29
14. L. Koutny	Czech	25:37	25:35	51:12
15. T. Lungu	Romania	22:12	22:43	49:43

SWEDEN

Energetic activity by several fliers in Sweden has resulted in good publicity for indoor modeling and a meet late in 1974 yielded 5 FAI fliers, 15 in the event which resembles PennyPlane (somewhat lighter model with the same dimensions), 2 Peanut Scale fliers and 15 HLG fliers. The Cat. I FAI record is 10:57, and best competition times in a 10 meter site: PennyPlane - 8:37, HLG (2 flight total) - 0:48; FAI - about 9 minutes. The contest mentioned above also had 67 Delta Dart/Sleek Streak competitors, including a good number of RC fliers.

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

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

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

New Members!Members Who Joined in January

CARL JAEGER, Box 2421, Jackson WY 83001  
 JOHN H. JENSEN, 1649 Elm St., Des Plaines IL 60018  
 SLAYTON JOHNS, 1165 Landsdale Dr., Fairborn OH 45324  
 TOM STONE, 6305 Inoa Rd., Ft. Worth TX 76111

Renewal Reminder

It has been mentioned here before that it is very helpful, from a time standpoint, for membership renewals to be made before the month of expiration. This is more true than ever lately, with the urgency of making a living impinging ever more on the spare time.

So, how do you know your membership is about to expire ignominiously? If your address label is printed and has a number like "12" in the upper left corner, better look in the centerfold - there should be a notice discreetly saying "Pay up, you bum!" If there is a paper label (maybe you've moved recently) or a printed label without a number (a few got made wrong), then dig back through your files to the issue which announced your membership. If you joined in February '75 (for example), then you are due in February of each year, and eventually your label will have "02" in the corner. If you are about due, send your \$3.50 and save me the time of shuffling your card to the deadbeat file, writing you a pleading letter and then shuffling the card back again.

Drop Al A Card!

Just after the last issue went out, we received word that Al Rohrbraugh has been ill. Although I understand he is improving, he doubtless will be happy to receive your get well cards. His address is 1415 Jewel Court, Ft. Wayne IN 46825.

'76 Nats

About the time this issue will be mailed, the Executive Council will meet; one agenda item will be final approval of various details of Nats activity. The indoor site recommended by the Nats Executive Committee Ohio State Fair Coliseum in Columbus, Ohio. It is 71 miles from Wright Field, which is the proposed RC and U/C site, along with AMA contest HQ. The FF site is in Springfield and is 55 miles from the indoor site.

Spread The Word!

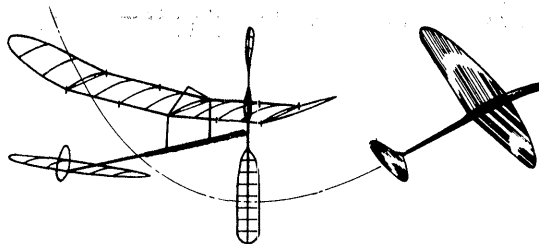
Time and again, when local fliers take time to contact the media in their area, people are exposed to our particular form of madness. The most recent result came when Ron Williams announced the Record Trials at Columbia University in VILLAGE VOICE, a semi-newspaper circulated in the general area. Not only did many spectators come to see the activity and go away impressed, but the same article mentioned NIMAS and people wrote for information.

A Special Request!

We have received a request that all who send contest results should also furnish ceiling height and other site information. This enables the readers to compare the times with their own sites, and adds meaning to the times besides just who won.

NIMAS Internats?

The most recent news on the proposed NIMAS bash was that it might be a "Nats warmup", with a banquet the night before Nats Indoor started in the same site. Unfortunately, the place was booked up from about 5 pm Sunday, Aug. 1 through most of the Nats. As a consequence, the back-to-back event is impossible. However, a glance at a map reveals that contestants coming from the west, southwest and south by car would naturally pass right by. From the southeast it would be a little out of the way, and from the east and northeast it would be four hours or more past the Nats area. Since food and lodging is about \$7 a day per person at Northwood Institute (owners of the site), and family accommodations are possible, it might well be the best "motel" deal around. Planning is continuing and more details will be available soon.

World Record Confirmed

Tom Vallee's 22:45 flight (announced as a possible world record in the Sept. '75 INAV) has been homologated by the CIAM. The next attempt on the FAI Cat. I World Record must exceed 23:13 to meet the 2% requirement. Tom has left a difficult task; anything over 18 minutes in a 6 m site is excellent! The model was an 8 1/2" chord monoplane of conventional layout and dacron braced surfaces. The prop was 20" dia., 31.5" pitch with symmetrical blade layout. No trim details or rubber info is now available.

Manhattan Cabin Flies Again!

Ed Whitten introduced the concept of the Manhattan Cabin model in the Nov. '65 INAV. Briefly, it was a model with a 20" span, a weight limit and an unusual cross-section requirement; it must R.O.G. on all flights. This formula has been a regular part of the recent activity in Miami, with times like 2 1/2 minutes in the Goodyear Hangar. This success has encouraged the Miami Indoor Aircraft Model Association to sponsor the Manhattan Cabin as an unofficial event at the '76 Nats. These rules are paraphrased from ones taken from Dr. John Martin's HANGAR PILOT:

1. Fuselage 20" max. total length excluding prop; must be able to enclose a BOX 2" x 2 1/2" x 4"; must have transparent windows/windshield of 2 sq. in. min. Motor must be enclosed and totally supported by the fuselage without use of removable motor sticks or motor tubes, etc.
2. Prop must be all-balsa of fixed pitch.
3. Wing must be unbraced monoplane, 20" max. span and 4" max. chord.
4. Stab must be 8" max span, 3 1/2" max. chord; rudder must not extend beyond fuselage.
5. Landing gear must be rigid and fixed with two 1" minimum diameter wheels; must support model and all flights must R.O.G.
6. Weight - 4 g without rubber min. Model must be covered with paper only.
7. Flying - unlimited attempts to make 5 flights, all flights R.O.G., less than 20 second flight is attempt.

RECORDS? MAYBE!

CAT. III Record Trials, Jan. 10, 1976, 104' ceiling  
 Low Library Rotunda, Columbia University.  
 Open PennyPlane - 7:46.8, Ron Williams  
 Senior PennyPlane - 8:56.6, Richard Whitten  
 Senior Ornithopter - 1:45.2, Richard Whitten

CAT. III RECORD TRIALS, Jan. 25, 1976, 132' ceiling  
 NASA Ames Research Center, Moffett Field, Calif.  
 Open PennyPlane - 13:56.2, Bob Meuser

CAT. II RECORD TRIALS, Jan. 25, 1976, 42' ceiling  
 Dallas NAS Drill Hall, Dallas Texas  
 Junior PennyPlane - 3:41, Mike Clem  
 Open PennyPlane - 6:26, Mike Fedor

NIMAS POSTAL MEET

The 11th Annual NIMAS Postal Meet will be open for entry through (postmark) May 3, 1976. All flights made as part of a sanctioned indoor meet held between Jan. 1 and May 3, 1976 are eligible for entry. Also, flights made at informal sessions after receipt of this newsletter are eligible, provided the flights are made and timed in accord with AMA Rules.

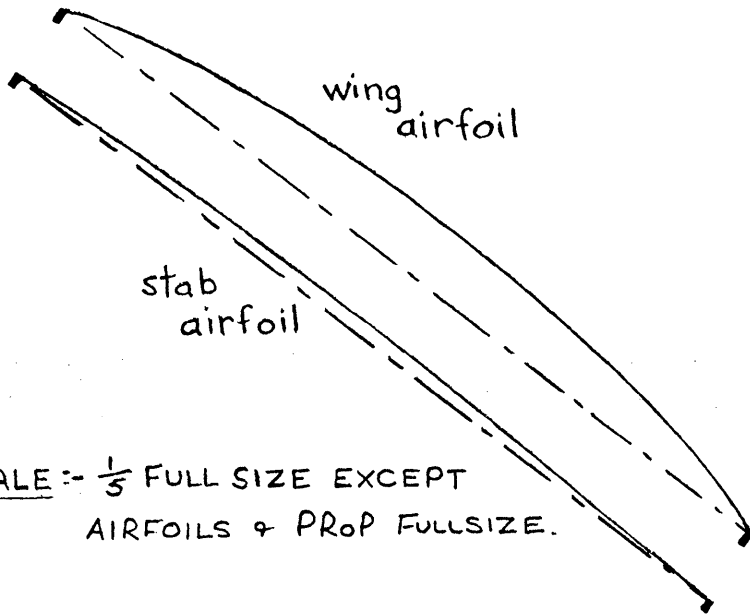
Events: Easy B, paper covered only, all-wood prop, solid motor stick and boom, no bracing.

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

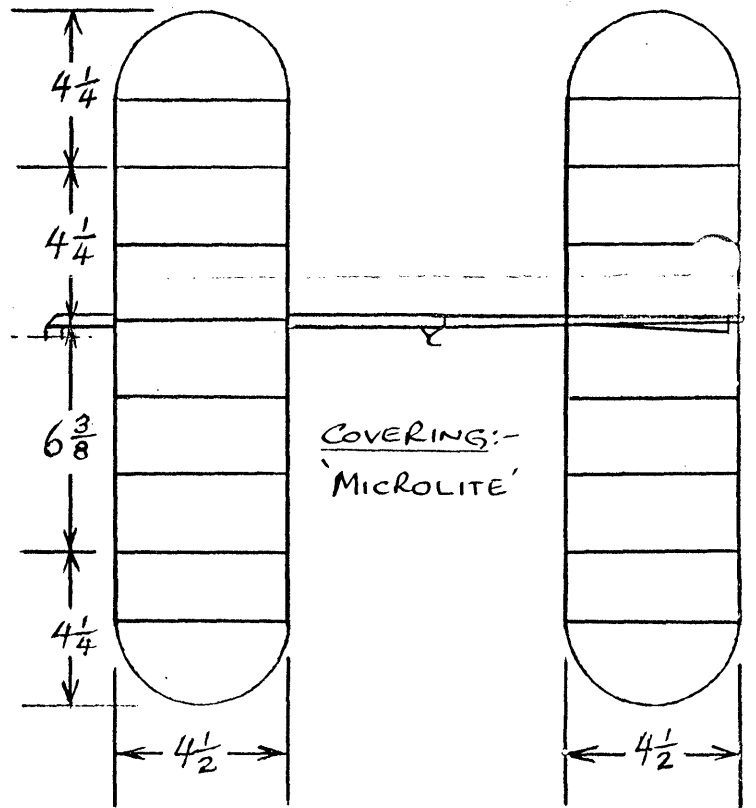
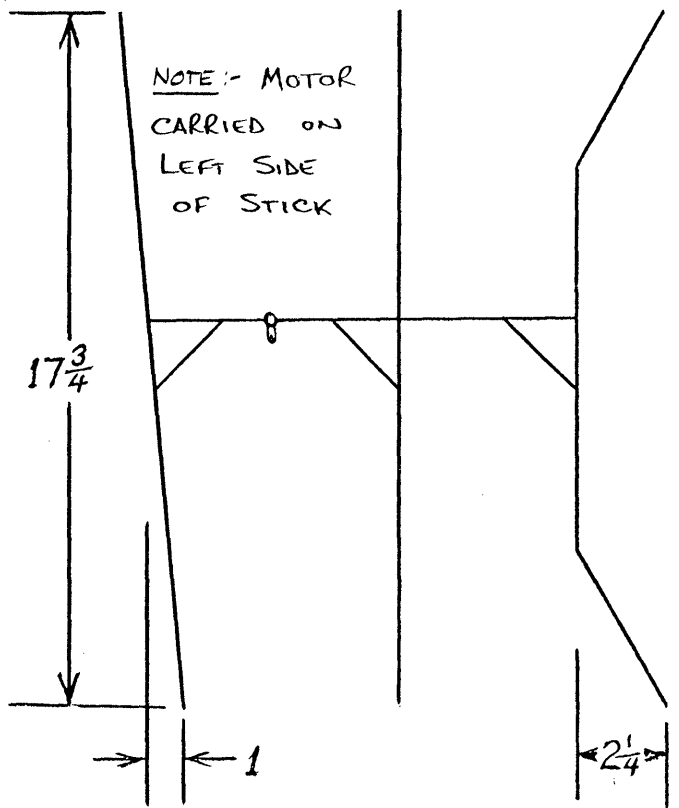
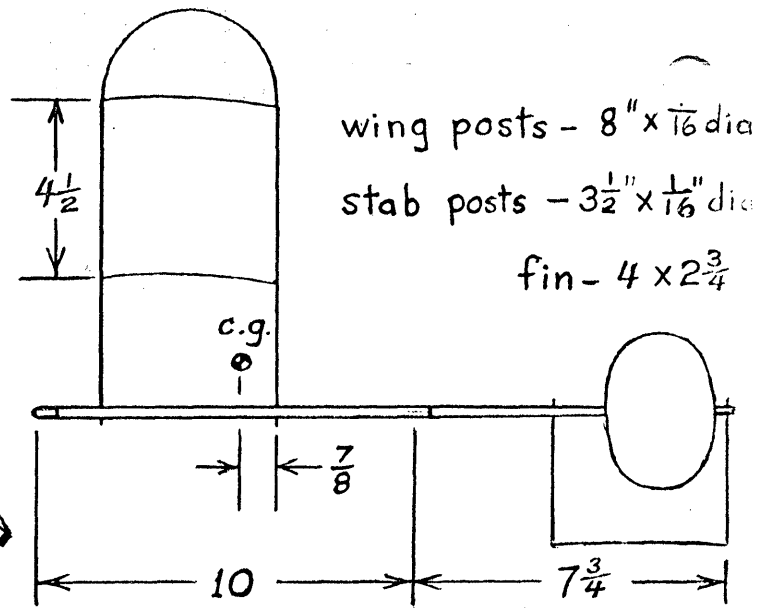
PennyPlane: AMA Rules (be sure to process model).

General Rules: Free entry. Separate events may be flown at separate sessions, but all flights for a given event entry must be flown on the same day. Please note ceiling height for each entry, using FAI ceiling measure. Ceiling height is used to compute fudge factors for final scoring. Separate classes for Juniors in each event; anyone may enter. Send entries to Box 545, Richardson TX 75080.

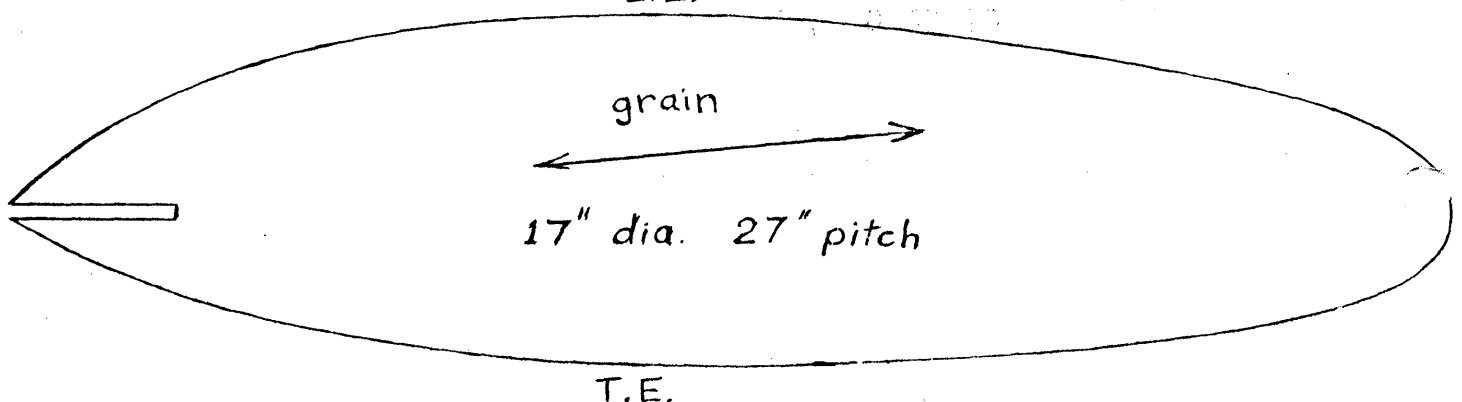
# PENNY-PLANE BIPE by Doug McLean.



SCALE :-  $\frac{1}{3}$  FULL SIZE EXCEPT AIRFOILS & PROP FULLSIZE.



L.E.



CONTEST CALENDAR

**POSTAL MEET - Star Skippers**

BAITED BREATH Postal, Mar./Apr. '76, for fliers thru age 15. Fly HLG, Class A ROG and Indoor Stick (all classes combined) under any ceiling under 50'; results will be fudged to 35'. For full contest rules, write for the Aug. 74 issue of STAR SKIPPERS newsletter, Star Skippers, P O Box 176, Wall St. Station, New York NY 10005.

**COLORADO - Denver Area**

Indoor contests Feb. 15 and Mar. 7, 1976; Feb. 15 at Hinkley High School in Aurora, Colorado and the Mar. 7 meet at a site to be announced. For details contact Ted Gonzoph, 12996 E. 2nd Ave., Aurora CO 80011, ph. 303-364-1854.

**CONNECTICUT - Glastonbury**

Indoor sessions 7:30-9 pm at Glastonbury High Gym, Feb. 20, Mar. 19, Apr. 13, May 11 and June 8, 1976. Sessions on Sunday, 8:30 am-1:30 pm, Mar. 14, Apr. 4 and May 2, 1976. George Armstead, 89 Harvest Lane, Glastonbury CT 06033, ph. 203-633-7836.

**FLORIDA - Miami**

Indoor Fly-Ins at Miami Dade North College, 9 am-2 pm, Mar. 7, Apr. 11 and May 9, 1976. Indoor contests at Good-year Hangar, Opa Locka Airport, 9 am-5 pm, Feb. 22, Mar. 21, Apr. 25 and May 23, 1976. Confirm hangar dates by calling 858-6363. Dr. John Martin, 3227 Darwin St., Miami FL 33133.

**INDIANA - Anderson**

The Central Indiana Aeromodellers are holding their 3rd Annual Indoor Contest Mar. 14, 1976 at the Anderson High School Gym, 8:30 am-5 pm. HLG, PennyPlane, Easy B, Peanut Scale, AMA Scale. Phil Sullivan, P O Box 2272, Anderson IN 46011.

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

Indoor sessions at DuPont Gymnasium, (Vassar St. and Mass. Ave., Cambridge MA; use Vassar St. entrance), Mar. 20 and Apr. 17, 1976, 6 pm-10 pm. Contest May 8, 1976, 10 am-8 pm. Ray Harlan, 15 Happy Hollow Rd., Wayland MA 01778, ph. 617-358-4013.

**NEW JERSEY - Union**

The Union Model Airplane Club is again sponsoring indoor sessions at the Livingston School Gym & Auditorium, 7 pm-10 pm, Mar. 11, Apr. 8 and May 13, 1976. Dan Domina, 4701 Fox Run Dr., Palmsboro NJ 08536.

**NEW YORK - Long Island**

Cat. I Record Trials at Friends Academy, Locust Valley on Saturday, Apr. 3, 1976.

Cat. II contest at Cantlague Park, Hicksville, Sunday, Apr. 11, 1976.

Cat. I contest at Nassau County Arena, Long Beach, Sunday, June 6, 1976.

Contact Jean Pallet, 30 Emerson Rd., Brookville, Glen Head NY 11545.

**NEW YORK - Manhattan**

The Columbia Indoor Miniature Aircraft Society has scheduled Record Trials for all indoor classes except HLG at the Low Library Rotunda, on the Columbia University campus in New York City. The site is about 85' diameter, topped by a dome, for a total height of 104' by AMA ceiling measure. The Trials are scheduled 9 am-4 pm on Feb. 21, Mar. 14, Mar. 27 and May 16, 1976. Contact Ed Whitten at P O Box 176, Wall St. Station, New York NY 10005.

**OKLAHOMA - Oklahoma City**

Indoor contest Feb. 22, 1976 at a National Guard Armory, 200 NE 23rd St., Oklahoma City. HLG, Easy B, PennyPlane and Peanut Scale. Matt Gewain, 9710 NE 3rd Place, Midwest City Oklahoma, ph. 405-737-4972 or 405-737-1085. Long distance travelers check site status just in case.

**OREGON - Albany**

Indoor contest at Albany High School Gym, 3705 South Columbus St., Albany; 9:30 am-3:30 pm on Feb. 22, 1976. AMA Scale, Unmodified Kit Peanut, Open Peanut, Popularity Scale, Keyhole Scale, Old Timer. Bob Stalick, 1120 Shady Lane, Albany OR 97321.

STATE OF THE ART

At long last, this column gets around to presenting a very deserving model. Thanks to the Vancouver Gas Model Club's newsletter "HOT HEAD", I was able to run their plan and then furnish the following commentary by Doug McLean on his PENNY-PLANE BIPE.

The airplane was designed with the help of some theoretical performance calculations. The theoretical predic-

tion method that I developed a few years ago was discussed in an article (Aug. '73 AAM) on John Kukon's FAI Tandem. (I did the calculations for that design, too, and wrote the "theory" half of that article.)

Theory indicates that the biplane design has a considerable edge over any of the monoplanes or tandems I've looked at. As a check on the theory, I looked at Jaecks' 1973 NATS winning PennyPlane. According to theory, that design should do about 12:30 under 90' ceiling. Since it actually logged 12:19, I think the theory is reliable.

I've only had two chances to fly the model in good sites. It won the PennyPlane event at the June '74 indoor contest in Vancouver, with a 12:29 flight under 75'. There was a bad side drift that carried the model into the seats on its winning flight, where it landed about 15' above the floor level. I'm pretty sure it would have done over 13 minutes without the drift.

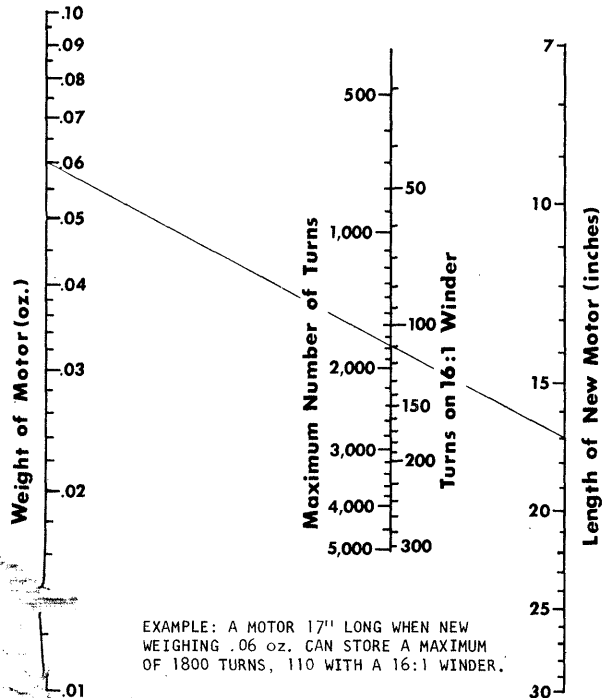
A month later I went on a business trip and had a chance to fly the model at Lakehurst on July 7, 1974. My two best flights were 15:04 and 16:03, with the model climbing about 110' for its best times. Actually, I think the design can do better than that, but it will require some development work to find a better prop.

The wing dimensions shown are for the top wing flat. The projected span of the top wing and the spans of the lower wing and stab are about 17 3/4". My model weighs just over one penny, and the motor on the best flight was an 18" loop of .102" pirelli with 1790 turns. Wood sizes not shown on the plan are:

	Wing	Stab
Center section spars	.045 x .070	.040 x .064
Tip outlines	.040 x .060	.040 x .050
Ribs	.033 x .060	.033 x .050
Motor stick	.019 x 5/16 I.D.	
Tail boom	.018 x 5/16 I.D. tapering to 1/8 I.D.	
Prop spar	3/32" round at center	
Prop blades	.025 sheet tapering to .015 at tips.	

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.



EXAMPLE: A MOTOR 17" LONG WHEN NEW WEIGHING .06 oz. CAN STORE A MAXIMUM OF 1800 TURNS, 110 WITH A 16:1 WINDER.