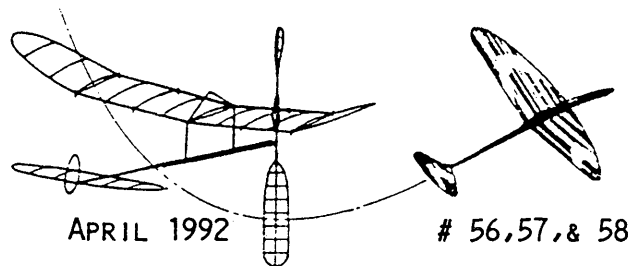


INDOOR

NEWS and VIEWS



EDITOR: PLENNY J BATES, 2505 WHITE EAGLE TRL SE, CEDAR RAPIDS IA 52403. PHONE 319-362-2969
FAX 319-364-7819

NEWSLETTER INFO

Burr Stanton: A Requiem

I find first impressions are usually completely wrong or inaccurate. I try to withhold judgement until I know a person better before I decide where to place that person in the mental file. This practice has served well and has often saved me embarrassment.

Burr Stanton was an exception. In 1980 I was referred to him to get helium delivered to West Baden. Contact was by 'phone and while cooperative and helpful, I was concerned if everything was going to turn out as well as he thought. When I arrived at West Baden the gas had not. The supplier assured it had been delivered. Burr's immediate response included a special one hundred and thirty mile round trip. He found the cylinders at another hotel.

Why mention this? Because it was part of his character. He probably could have resolved the problem over the 'phone, but feeling responsible he and his lovely wife made the special trip to see that it was delivered. This first face-to-face meeting completely disarmed me and I dropped any attempt to wait and see before offering and receiving friendship.

He was a great bear of a man with a permanent half-smile which seemed to indicate his amusement over the human condition. His wife, Alice, was ever present at his side supporting him and contributing her own honest, homespun advice and love to those who came into the warm circle of their lives. Burr flew at many USIC contests. He was limited by chronic heart problems and other interests. In the end he contracted cancer and fell victim quickly.

Burr leaves a legacy to model aviation which will not be appreciated for many years. He was not a man to blow his own horn. He didn't have the time to learn how. He was a doer. His newsletter, widely read and circulated, will be a model for others for decades to come. He developed the Louisville area indoor movement. I loved being in his presence. I wish I had taken the time to know him better. My life would have been richer.

Don Lindley

As most of you know Frank Kleser was the victim of a stroke which prevented him from continuing as editor. Feel free to thank him for a job well done and wish him well. Address 2529 Whipoorwill Lane, Vero Beach, FL 32960.

For those of you who still have not received issue #51-52 please let me know. Your file will be flagged and I will try to get a Xerox copy to you. That issue was filled with 1991 AMA National Indoor Champ and USIC results.

Your new editor is an old retired anesthesiologist. How old you ask? Far too old to take criticism kindly. However inexperienced enough to want all the help he can get. If I fail to give proper credit for material used in INAV please let me know promptly and every effort will be made to correct the error. Aside from a desire to publish detailed "how to" instruction at every level from beginner to expert I have no firm ideas on the direction INAV should take. Submissions of PLANS - HINTS - TIPS - DETAILED INSTRUCTION - CONTEST RESULTS- CONTEST ANNOUNCEMENTS - or anything else you think might interest other indoor modelers is MOST WELCOME. Many times the one who has just learned how to do something is well equipped to tell others "how to" as all of the details are fresh in mind. So do not hold back because you have never submitted for publication before. Do not worry about spelling. Mine is so poor I'll never notice and the spell checker will clean it up enough our friends will never know. The experts do not need this kind of thing but if the local expert builds up a packet of tips and uses it as a hand-out it helps the beginners develop. If your flying site retention is based on having a minimum number of flyers helping beginners can save your site.

Jesse Shepherd Jr. (3703 Hialeah, Arlington TX 76017) has been kind enough to offer his help with gathering and editing of F1D material. Send material to either Jesse or to me. Jesse is the same fellow who published INDOOR REPORT at his own expense to fill in after Frank's illness. On some TV game show they say "come on down." From here come the words "send it in."

As a first time newsletter editor I am a bit overwhelmed but determined to do my best. Like the fellow who was in over his head and learning to swim I have only one word "HELP !"

The Bean Machine A serious Bostonian for non-serious modelers

This airplane was designed for a contest among our regular Wednesday night indoor flying session members and was never intended to be an all-out contest machine. We fly in a 26 foot ceiling with a lot of obstructions, so ruggedness and stability were paramount in the design criteria. Since many of our fliers had never attempted a full-fuselage model before, it was necessary to keep it simple and easy to build to the 7 gram minimum weight. A single surfaced wing and tail surfaces were used to make the weight achievable, even though they would not be contest-legal under the '90 rules. It was felt that it was more important to help the newcomers to make the light weight than to develop a model which could be campaigned into 1990.

The result was much better than we had expected. The model not only flies well at minimum weight, but is easily adjusted and flies very creditably at over 20 grams (we have some beginners with nothing but RC experience in our group). Propellers used run the gamut from Slick Streak plastic through bent sheet to carved special units. Rubber width varies from 1/16th to 3/32nds, depending on the weight and propeller. The fin was made on the small side to keep the model from being too sensitive to adjustments and may be enlarged if the builder wishes.

The second generation of these models, built by our fliers, showed some excellent ingenuity. The original was purposely kept well below the maximum span limit, so that changes in dihedral angle would not result in the airplanes exceeding the limit. Very quickly the left wing tips of the models started to grow to make the models near the maximum span with very flat turn capabilities. An extra spar, glued to the bottom of the ribs, proved a popular way to make up for too-soft leading and trailing edges. Landing gear moved as far forward as the nose piece and as far back as the wing leading edge. This proved to be a good way to shift the C.G., but had no other effect. Two optional changes are shown on the accompanying drawings. A sub-fin is shown which will make the model more directionally stable with some increase in sensitivity to adjustments. A set of struts, which can be added after the wing warps have been established, will keep the whole wing very rigid and capable of taking a lot more abuse.

The Bean Machine was not intentionally designed to be ugly, it just came out that way. Those pleasant, curving lines in the top and side views of most fuselages make it very difficult to build them straight and true. Similarly, the soft spot of most Bostonian models is the bottom of the nose frame. Hence the "A" frame nose on this model. Since the wing fastens with four glue spots (remove the paper covering where they meet) it is very simple to insert wedges to correct or install warps. The tail surfaces are permanently glued only at the trailing edges. The leading edges are left free to be moved and spot-glued for adjustment. The large stab allows the wing to be moved far forward with a resulting longer moment arm for increased pitch stability. Several second-generation models have used lifting tails with no apparent improvement in performance.

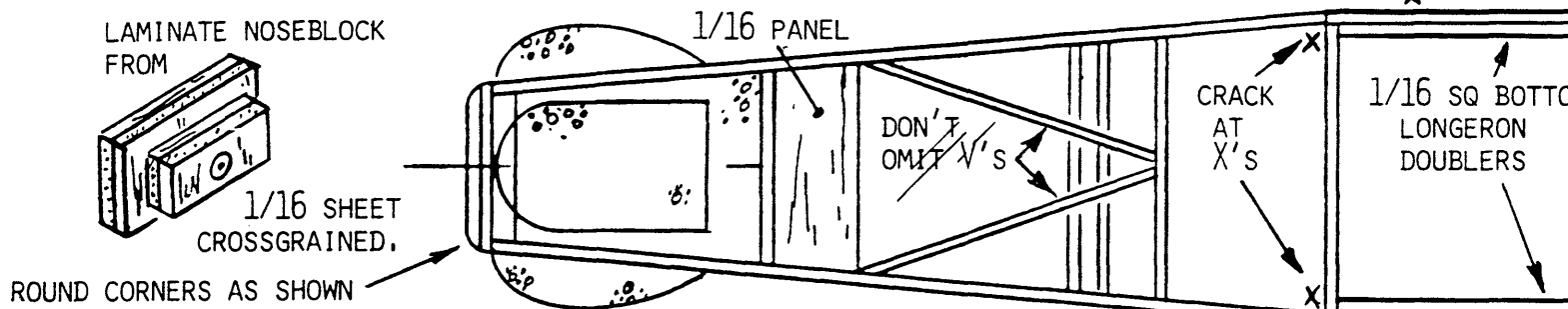
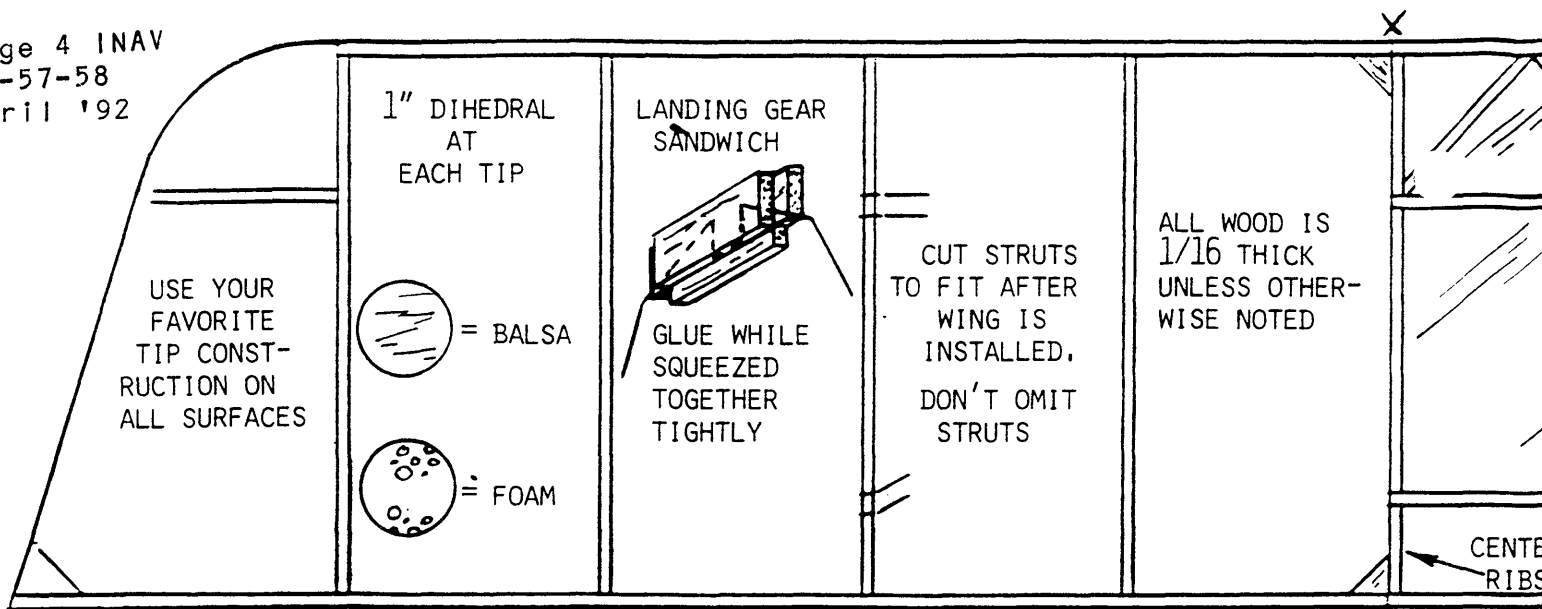
I will not attempt a "glue stick A to stick B" description of building the model, but will try to point out some features which might not be familiar to people who haven't built a stick and tissue model before. The fuselage sides are built over the plan, one on top of the other to assure similarity, and then slit apart after the glue is dry. The sides are cracked at the leading and trailing edge of the wing, so that they can be easily made to conform to the shape shown in the top view. Cross-piece sticks, shown by "X" in the side view, are glued in place, starting with the cabin box. If this unit is lined up properly, square in all three planes, the rest of the fuselage is a piece of cake. The landing gear is inserted with its 1/16 X 1/4 mounts instead of a cross-piece. The nose block, with a box of 1/16 X 1/8 which is a tight friction fit with the nose frame, is shaped and sanded while spot glued to the fuselage. A 1/8 in. hole is drilled accurately perpendicular to the face of the nose block for the thrust bearing.

Covering is an area where everyone has a different approach. Obviously, you should get the tightest tissue you can. This can range from condenser paper or Japanese tissue available from indoor supply houses to Gamp! hand-made Japanese paper which is available at some specialty paper stores. Whatever you use should be pre-shrunk. Again, there are many ways to do this. Most people shrink on a frame and transfer to the model. I prefer to let the wet paper almost dry on an old storm window and then trim the almost-dry sheet. Either way works. Carefully cover the fuselage and steam or alcohol spray it to remove any puckers. I mist on a coat of aerosol acrylic lacquer to reduce the humid weather puckering later on. The wing and stab should be covered on the top only and the fin on the left side only and they should not be treated further. Cover the cabin windows with cigarette package cellophane, using thin dope as an adhesive. Plastic wheels from a Slick Streak will get you into the air quickly with a minimum of work, or very light balsa or foam wheels can be made to keep the weight down. The wheels must be at least 3/4 inch in diameter.

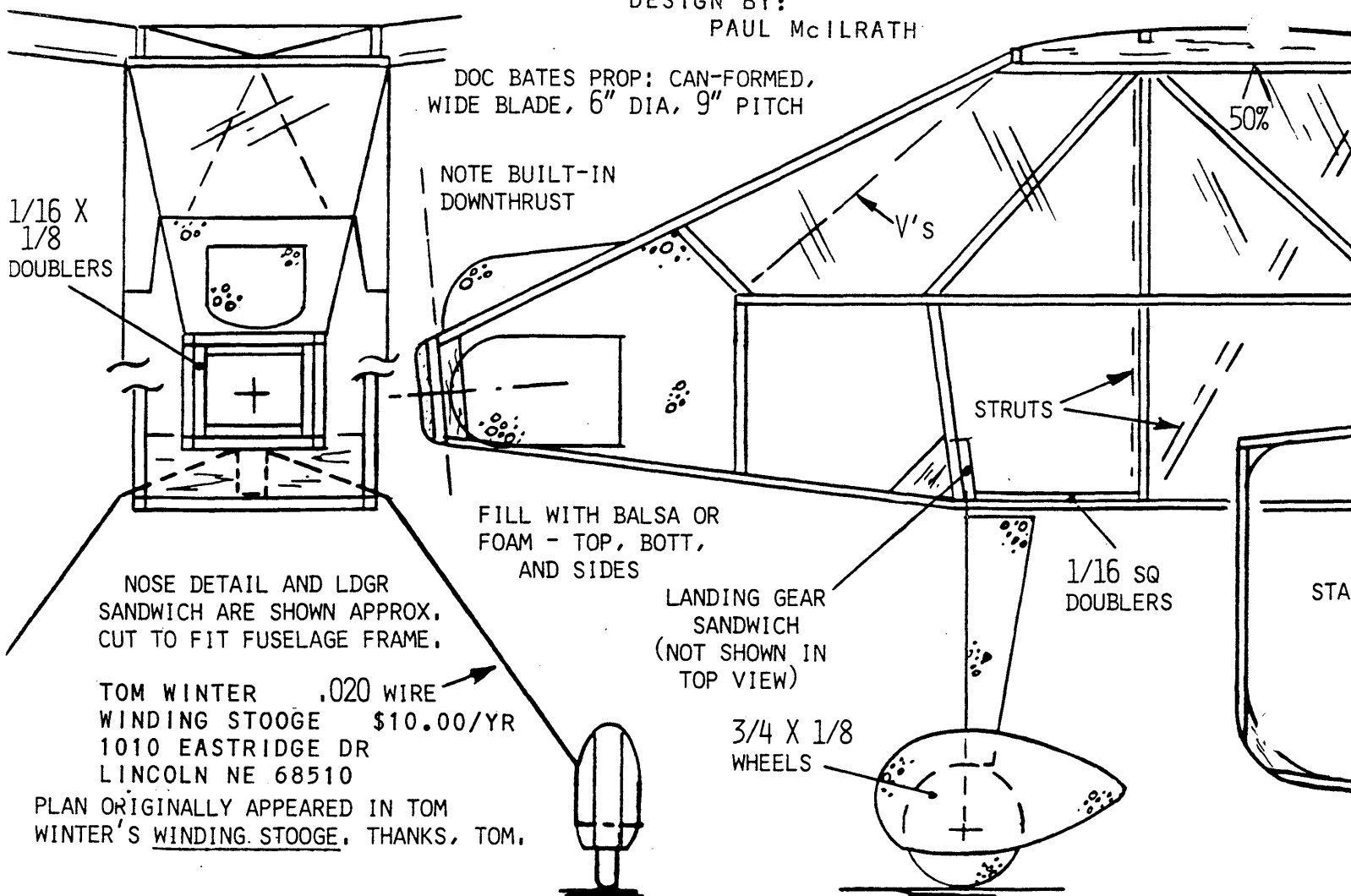
The model will probably require about a 1/32 shim of right thrust and the leading edge of the fin will lie along the right top longitudinal (left rudder) to give a circle of about 15 feet diameter. There should be about 1/8 of wash-in (trailing edge low) in the left wing to reduce the bank at high torque and the stab should be about centered in its slot.

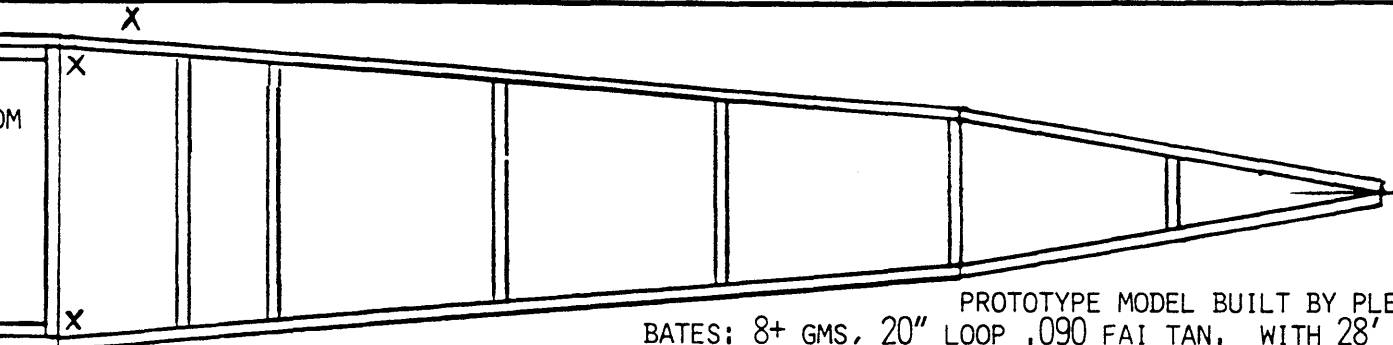
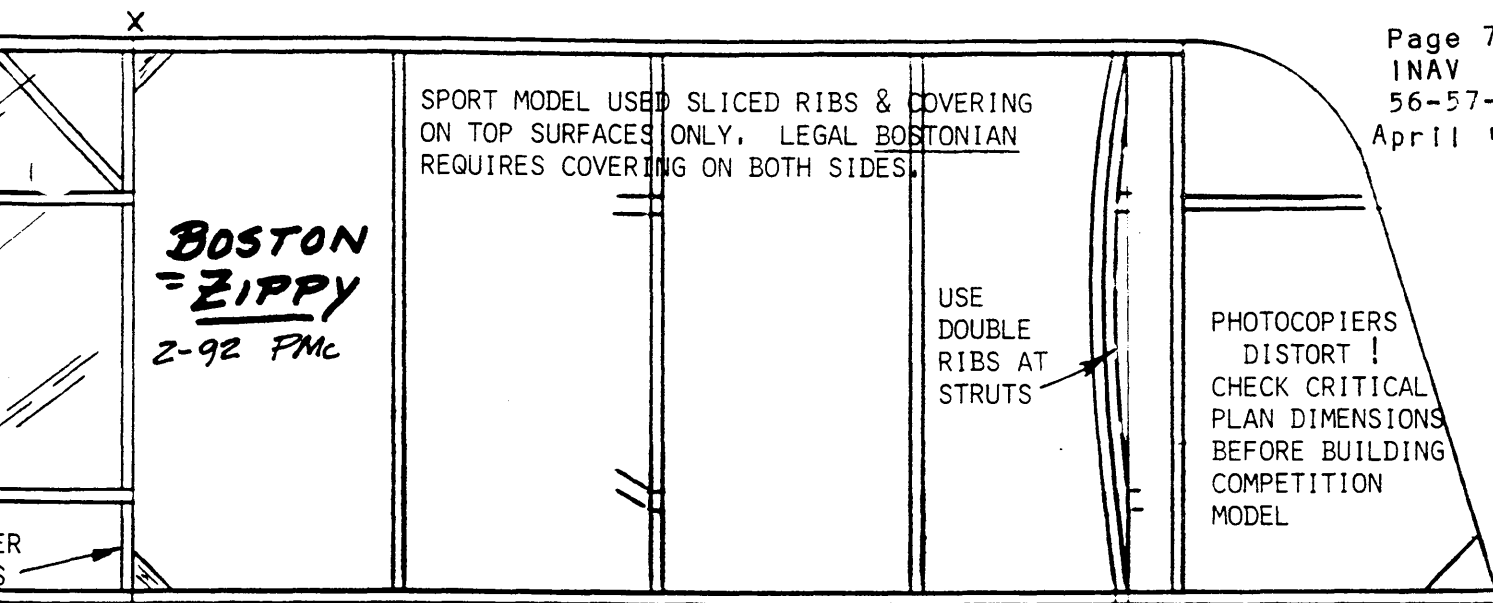
A Slick Streak prop with a 1/16 rubber loop 15 inches long should get the model high enough to get your adrenaline pumping. Remember, 7 grams is just a little less than the weight of a dime and a nickel, so it doesn't take a lot of power to fly this thing. After you've had some fun with the plastic prop, try making a bent or carved wood prop with about 10-12 inch pitch and a blade width of over an inch (6 inches is the max. diameter) and you'll be amazed at the performance capability of this exceptionally ugly airplane. The second generation airplanes are exceeding 2:00 in our low ceiling site without ceiling scrubbing or bouncing. Use a winding tube with a torque meter and a winder to protect the airplane and get the maximum number of turns and have a ball. Remember that you'll need a double covered set of surfaces (top and bottom) to compete, but I wouldn't be surprised if this wouldn't be a viable design with that modification.

THE THING TO DO IN '92. JOHNSON CITY IS A WONDERFUL PLACE TO BE IN EARLY JUNE. The weather and scenery is enough reason to make the trip. But for rubber twisters there is much more, the 116 foot "Mini-Dome" on the campus of East Tennessee State University is a world class indoor flying site. And for you big city types a nice surprise, fine hotel rooms for 1 to 4 people only \$61 with the tax. The air conditioned dorm rooms are fine and the price is right, if you do not need the amenities of the hotels. Did not have room for the dorm./hotel sheet. Please ask for the full contest packet if you sign up for the contest from this sheet. PJB

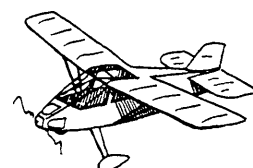
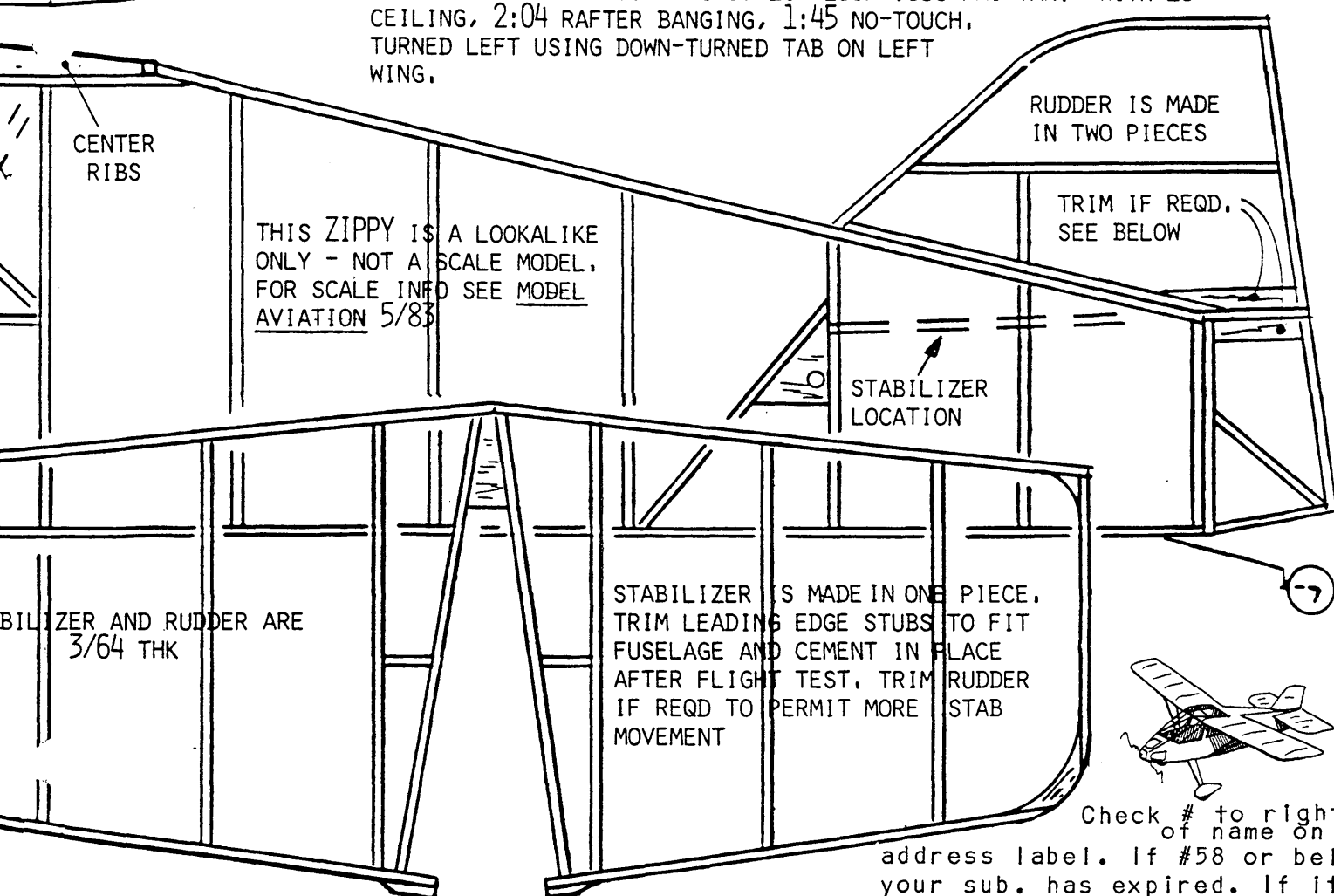


DESIGN BY:
PAUL McILRATH





PROTOTYPE MODEL BUILT BY PLENNY BATES; 8+ GMS, 20" LOOP .090 FAI TAN, WITH 28' CEILING, 2:04 RAFTER BANGING, 1:45 NO-TOUCH, TURNED LEFT USING DOWN-TURNED TAB ON LEFT WING.



Check # to right of name on address label. If #58 or below your sub. has expired. If it is #61 or below it will expire next issue

ELEVENTH UNITED STATES INDOOR CHAMPIONSHIPS

JUNE 4, 5, 6, 7, 1992

INAV 56-57-58

April '92

"MINI-DOME"—East Tennessee State University

Johnson City, TN



CONTINUED FROM PAGE 5

TABLE AND CHAIRS

If you are driving, please bring tables and chairs along. There will be a limited amount of tables and chairs available for rent at \$2.50 per full day (1 table and 2 chairs). No partial days rent—you may do your subleasing (no gouging!) NOTICE: You are responsible to pick up your table and chairs and return them at the end of the meet.

LIGHTING

Bring your own portable fixture along with plugs and extra long extension cord.

SCALE JUDGING

Models must be submitted with documentation and contestant's name—FAC, P-Nut and Rubber Scale by 12 noon on Friday, June 5. Bostonian and KIT Plan by 7:00P on Thursday, June 4. Turn-in room located at northeast end of dome. NOTICE: Photos en mass only permitted between 12:00 to 12:30P and 7:00 to 7:30A.

NOTE: For details of the Miami Grand Prix, send a large SASE to Dr. J. Martin, 2180 Tigertail Avenue, Miami, FL 33133.

All Seniors and Open fliers will be required to time flight and assist as called upon (be happy and VOLUNTEER!) Bring your own stopwatch.

All 1992 AMA rules apply. All rule change "proposals" DO NOT APPLY!

PRACTICE

During official events, practice is permitted in two basketball courts on north end of dome (at your risk).

NOTICE: Flying schedule may be modified during the contest. The absolute final/official/positively exact schedule will be that which is posted at the official's table. It is your responsibility to check and know the start/stop times of the events. (It may be advantageous to overlap some events.)

(Ceiling—116', floor—208' x 420')

Astro-turf may not be on floor.

Helium available, bring your own balloons. NOTE: USIC will provide a Balloon Pool for retrieving models only. Balloons must be returned to pool immediately after you have retrieved your model. A \$5.00 fee will be charged for breakage of any balloon used from the pool to cover cost of balloon and helium.

All entrants must be AMA members or members of their country's governing body. (Contestants provide proof.)

Entries must be postmarked by May 10, 1992. Late fee \$10.00 payable on site.

PENNYPLANE FLIERS

The new 20" overall total length may disqualify your present model. It is your responsibility to comply—please check before the contest. No model part shall extend beyond 20.00 inches.

USIC GRAND CHAMPION

If you wish to participate for the Grand Champion Award, you must select a maximum of seven events for scoring. Your declaration of events must be made before you compete.

EVENTS ELIGIBLE: HLG, F1D, H.L. STK, ROG CAB, ORN, EZB, INT. STK, P-NUT, AMA SCALE, PP, LPP, MAN, HELICOPTER, BOSTONIAN.

RULES FOR FAC EVENTS

- Two different models may be entered in each Hi-wing Monoplane and Biplane event.
- Any model entered in Hi-wing and Biplane is not eligible for WWI Combat and Golden Age.
- No bonus points awarded in the Biplane event.
- WWI models must have guns, rigging, and struts. Forty minimum scale points.
- Golden Age models are of any aircraft produced from 1920-1940. Retract gear planes must have gear in down position. No race plane. Forty minimum scale points. Twenty-four inch wing plan maximum.
- Scale points awarded as follows:

Construction and Details	Coloring and Markings	Workmanship	Flight Points
A maximum of 30 points will be given for general accuracy and the extent of detail, such as struts, rigging, engine cowl, exhausts, armament, etc. No cockpit or cabin interiors will be considered, except for the windscreen and instrument panel, unless a full panel is impossible due to a high thrust line. Not much Some of it Most of it All there	A maximum of 20 points will be given for accuracy and extent of coloring and markings. Judging will consider items such as insignia, numbering, striping, etc., and correct coloring or serial number for a particular subject modeled. Where a model is built of a proposed design, the full scale prototype never having been built, then its color and markings should reflect its designed purpose and era of its creation. Silver colored tissue may be used to represent polished aluminum. There will not be any difference in scoring between the proper colored tissue and painted surfaces.	A maximum of 12-1/2 points will be given for workmanship: good covering, alignment, neatness, etc.	A maximum of 82-1/2 flight points will be awarded for each flight as follows: 0 to 60 seconds: one point per second 61 to 90 seconds: 1/2 point per second 91 to 120 seconds: 1/4 point per second Over 120 seconds: no points Three officials flights. Best flight counts. Twenty seconds is considered official.
- Hi-wing Monoplane, Biplane, and WWI Combat have a maximum wingspan of 13".
- WWI Combat and Golden Age are mass launched.

If you desire a set of FAC rules, send \$1.00 and SASE to CD: Jim Miller, 827 Yorkhaven Road, Cincinnati, OH 45240.

F1D AND AMA H.L. STICK

It is not permitted to have one flight apply to two events. Each event must be separately flown.

CATAPULT GLIDER

- Maximum wing span—12".
- Maximum wing chord—3".
- Maximum launching stick length—6".
- Nine official flights. (All launches count.)
- Sum of best two flight determines winner.

MINI STICK RULES

- Wing span 7" max.
 - Wing chord 2-1/2" max
 - Length, front bearing to rear most point 10" max
 - Motor stick front bearing to rear hook 5"
 - Stab area max 50% of wing
 - All wood prop.
 - Any covering except micro-film
 - No exotic materials
 - 43 gms/.015 oz min. wt. less rubber
 - Best flight of 5 officials. 20 sec. min. 2 attempts / flight.
 - Mass launch. One flight. Last one down wins.
- * Note: A perpetual Burr Stanton memorial trophy will be presented in Mini Stick by the I.M.A.R.C. (Indoor Model Association of River City)

NO-CAL PROFILE SCALE

- A recognizable model of a full-scale aircraft, with a wing span not exceeding 16".
- The weight of the model (excluding the rubber motor) shall be no less than 6.2 grams (two pennies).
- No fancy gadgets permitted—plastic prop is permitted. Balsa and Jap tissue shall be the main construction materials. Use of hi-tech materials such as carbon fibre, boron, etc. is not permitted.
- Model must have control surface outlines, window outline, and registration markings.
- Win based on best of five flights (20 second minimum and two attempts/flight).
- Model must have full landing gear as per full size aircraft. No profile gear allowed. Models of aircraft with retractable gear may be depicted with gear retracted.

UNLIMITED RUBBER SPEED AND PEANUT SPEED

- Models must be rubber powered and propeller driven.
- Models must start from an unassisted ROG launch from a normal three-point sitting position. This rule will be enforced.
- Model to be timed for two complete laps around two pylons set 20 feet apart.
- Flights will be disqualified if the model touches the pylon or ground after crossing the starting line.
- The timer will stand in line with the two pylons. Timing starts when the model crosses the line determined by the two pylons and ends when it crosses the line after completing two laps.
- Shortest time for two full laps determines winner.
- No limit to the number of models or launches.
- Winner only receives cash award.



KIT/PLAN SCALE

- Models must be built from published plans or kits.
- Size of plans may be reduced if wood sizes are in proportion.
- All surfaces must be covered both sides, or be solid material.
- Models must take off unassisted for official flights.
- Any flight in which the model is airborne for more than ten seconds is official.
- Two attempts may be used for each of five official flights.
- Timing starts at release of the model and terminates when the model next touches the floor or comes to rest after take off. The ten second hang-up rule will be used.
- No flight score (number of seconds) will exceed the total of Craft and Fidelity points.
- Up to 60 points will be awarded for fidelity of the model to the plans and instructions from which it was built.
- Up to 40 points will be awarded for Craft, based on workmanship and finish.
- Nose block and rear rubber post may be altered without penalty.
- Tissue type and color are optional, but control outlines and registration numbers (even if made up) must be used. Decorations which are to be cut from plan and glued to model may be reproduced on similar weight paper and cut out to preserve plan.
- Propeller may be altered from plan without penalty.
- Final score is sum of best two flights plus Craft and Fidelity.

USIC FEDERATION ROG

- The model must be powered by a single loop of rubber, hung between the prop shaft hook and a fixed hook of the motor stick. NOTE: Any mechanism, device, or gadget that alters the torque delivered to the prop by the rubber loop is not allowed.
- All flights must rise off ground.
- The assembled model without rubber must weigh 3.1 grams or more.
- The propeller must be of one piece molded plastic. The propeller diameter must be six inches or less. NOTE: You may add a bushing to the prop shaft hole. You may lighten the prop by scraping or sanding, etc. You may cut down a larger prop. You may alter the pitch of the prop. You may not cut out and recover any part of the prop.
- The projected wing area must be 30 square inches or less.
- The projected stab area must be 50% or less of the projected wing area.
- The length of the model from the front of the propeller to rearmost part must not be greater than 18 inches.
- The landing gear must have two wheels and support the model in a normal position when at rest. The diameter of the wheels must be 1/2 inch or more. The wheels must turn freely while supporting the model. NOTE: The above gear and wheel tests must be met before the flight and after the landing, without any repairs or adjustments. If not, the flight is disqualified!!!
- Except as noted above, there are no restrictions for coverings, dimensions, or construction.
- Minimum flight of 20 seconds counts. Best flight of five decides.
- One high-time award and three places for two-man by state team.

The intent of these rules is to define a new model based on the original "Federation R.O.G.". Models that meet these rules have already flown seven minutes. NOTE: The "Delaware Valley Federation of Model Airplane Clubs" wants the original "Federation R.O.G." to continue to exist, unchanged.

SUBSCRIPTIONS

The plan is to publish this newsletter four times a year. Subscriptions rates for four issues as follows:

\$ 8.00 U.S.A. Canada, Mexico
\$ 9.00 overseas surface mail
\$10.00 Air Mail Europe & S. America
\$11.00 Air Mail Asia, Australia & New Zealand

Please remit in U.S. dollars by cash, check drawn on U.S. bank, money order using U.S. bank, or U.S. Postal money order. Make checks payable to order of INAV.

Send to: Plenny Bates
2505 White Eagle TRL SE
Cedar Rapids IA 52403-1547
USA

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SUBSCRIPTION EXPIRES THIS ISSUE

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FOR RENEWAL - See rates above

NO X - Indicates at least one more issue.
Each full issue will usually be three # e.g.
one full issue may be #56, #57, & #58
Check your address label to the right of your name for your expiration #.

"WHY FOR - FOUR ?"

Why four large issues rather than many smaller issues? In a word "postage" But being unsure the correct decision had been reached I asked a friend to apply multifactorial analysis to this problem. Factors considered were: postage costs, printing costs, overhead allocations, operating costs, marginal costs, capital outlays, opportunity costs, variable costs, direct costs, and incremental overhead. These factors were inserted into a linear optimizer program and run on a Cray computer. The computer output was in Street English "postage will eat you alive if newsletter weight is much under one ounce." The only thing I can see changing this would be lack of material or a temporary personal problem. Every effort will be made to publish at least every three months. PJB

Emanuel Radoff submitted the following: "This prop was used at Johnson City June 1991. epoxy was used on all prop spar joints. This prop structure allows the use of the full 10" tail boom for longitudinal stability". If the C.G. is at the usual place assume the wing must be on posts long enough to clear the prop blades. This might introduce an "up" couple that could make stalling during the power burst difficult to control. To be the first to have the answer to this question attend Johnson City in June and watch Emanuel use this innovative prop. - PJB

INAV
56-57-58

CHICAGO AERONUTS INDOOR MEET
SYCAMORE, IL JAN. 19, 1992
C.D. DON LINDLEY

Page 9
April

January 19th was a below zero day in north central Illinois but there was no wind. This was inside the Sycamore Armory. Outside was about the same with a slight breeze. OK so I exaggerate a bit but it was cold. Big time drift has been a problem in this site so those who flew here last year were happy to leave their coats on. Drift was not a big problem but rubber does not do so well at low temperature. But everyone flew in the same air so the contest was good. It is a treat for me to fly at Sycamore because the box beams cannot catch a model. It was nice having Dick Hardcastle up from St. Louis MO. As the results show he did well in spite of his claims of "old, repaired, not recently flown, inferior models." Don't think anyone believed him. Note the Bean Machine (full sized plan this issue) did well for Kenny Krempetz and Grant Lovett who are not well known in F1D circles. PJB

Limited Penny P. (18)

H-L & Cat. Gilder (11)

1-Ted Seaver 7:50
2-Chuck Marcos 7:49
3-Ed Konefes 7:24
4-G. Wisniewski 7:17
5-D. Hardcastle 6:47
6-Bob Olson 6:33
7-Terry Hreno 6:09
8-Bob Warmann 5:57
9-Jim Fellinn 5:56
10-P. Bates 5:50

1-Bob Warmann 64.0
2-Bob Johnson 60.5
3-Ed Konefes 53.0
4-Ken Krempetz 47.0
4-Lloyd Meyers 47.0
6-Kurt Krempetz 45.8
6-Tony Italiano 45.8

No-Cal Scale (11)

1-Terry Hreno 2:41
2-Ed Konefes 2:33
3-C. Sotich 2:12
4-Tom Nied 2:03
5-Bob Warmann 1:22
6-Joe Konefes 1:19

Bostonian (10)

1-Chuck Marcos 310.2
2-Ken Krempetz*187.2
3-Grant Lovett*169.4
4-Terry Hreno 160.1
5-Joe Konefes 141.8

"Easy" B (12)

1-D. Hardcastle 11:43
2-G. Wisniewski 10:39
3-Bob Johnson 7:44
4-Bob Fellin 7:41
5-Chuck Marcos 6:36
6-Bob Moulton 5:54
7-Tony Italiano 5:40

Mini Stick (14)

1-Bob Warmann 6:05
2-D. Hardcastle 5:33
3-Ted Seaver 5:30
4-Wally Simmers 4:57
5-P. Bates 4:33
6-Tom Nied 4:30
7-Bob Olson 4:24
8-Ed Konefes 4:15

Peanut Scale (4)

1-Bill O'Dell 481.8
2-Jim Quinn 265

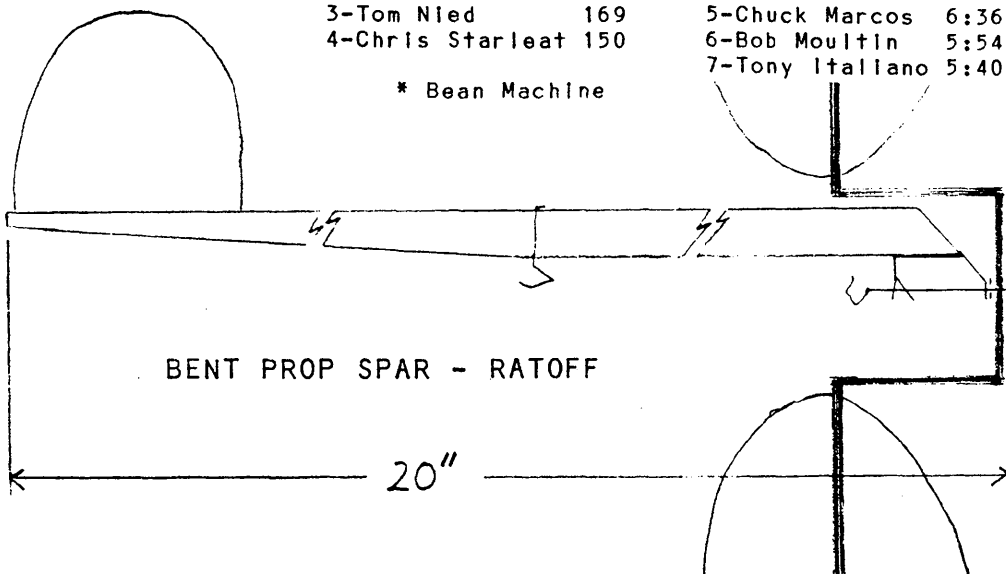
Kit/Plan Scale (7)

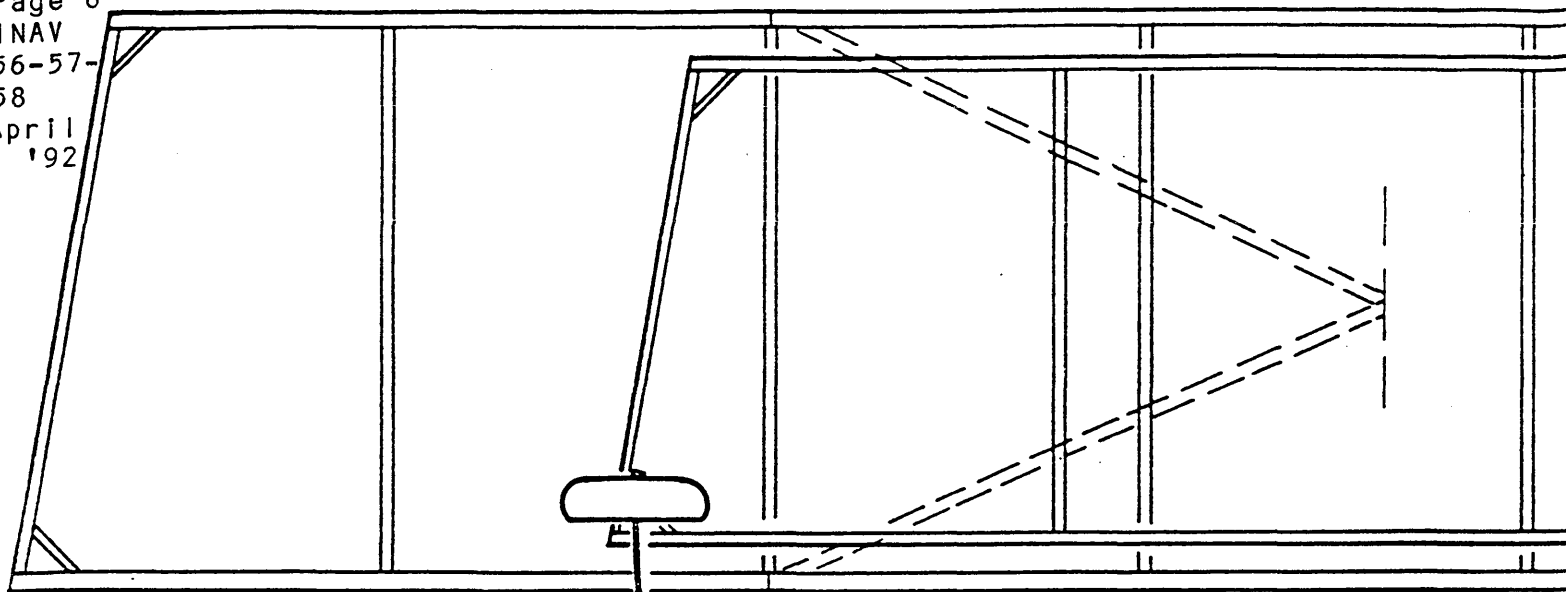
1-Ed Konefes 274
2-P. Bates 231
3-Tom Nied 169
4-Chris Starleaf 150

* Bean Machine

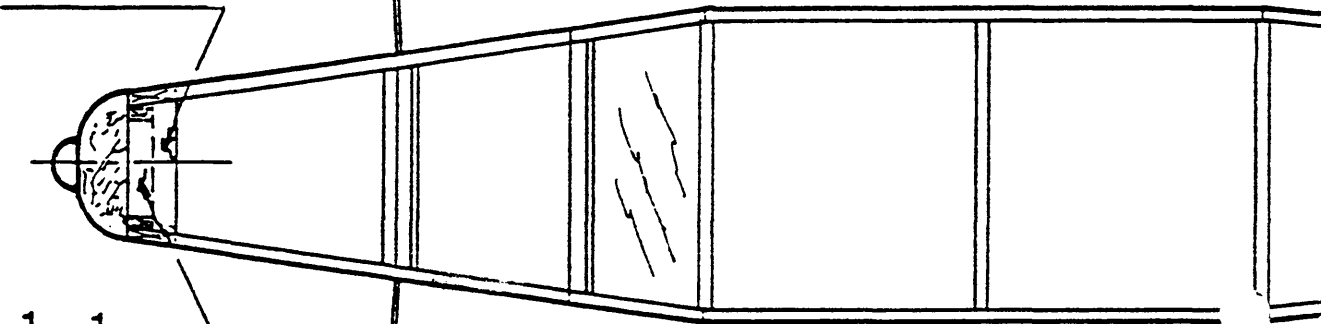
BENT PROP SPAR - RATOFF

20"





$\frac{1}{16} \times \frac{1}{4}$ For 7 gm plane use 7.5- 8 lb/ft³ longerons & spars everything else



$\frac{1}{16} \times \frac{1}{8}$

Peck Polymers
nose button

Balance Point

$1\frac{5}{8}$

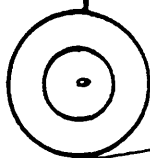
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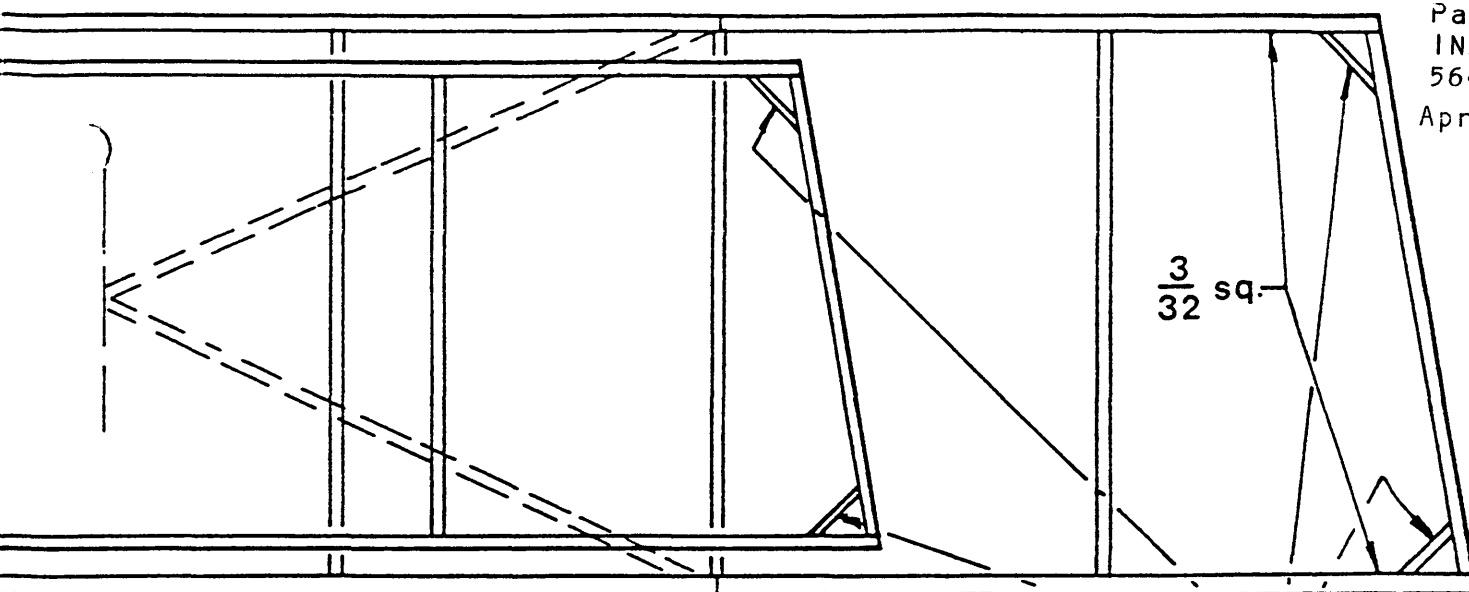
$\frac{1}{4} \times \frac{3}{4} \times 1\frac{1}{8}$

$\frac{1}{16} \times \frac{1}{4}$

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ON ADDRESS LABEL. IF IT IS # 58
OR BELOW YOUR SUBSCRIPTION HAS
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61 SUBSCRIPTION WILL EXPIRE
WITH NEXT ISSUE.

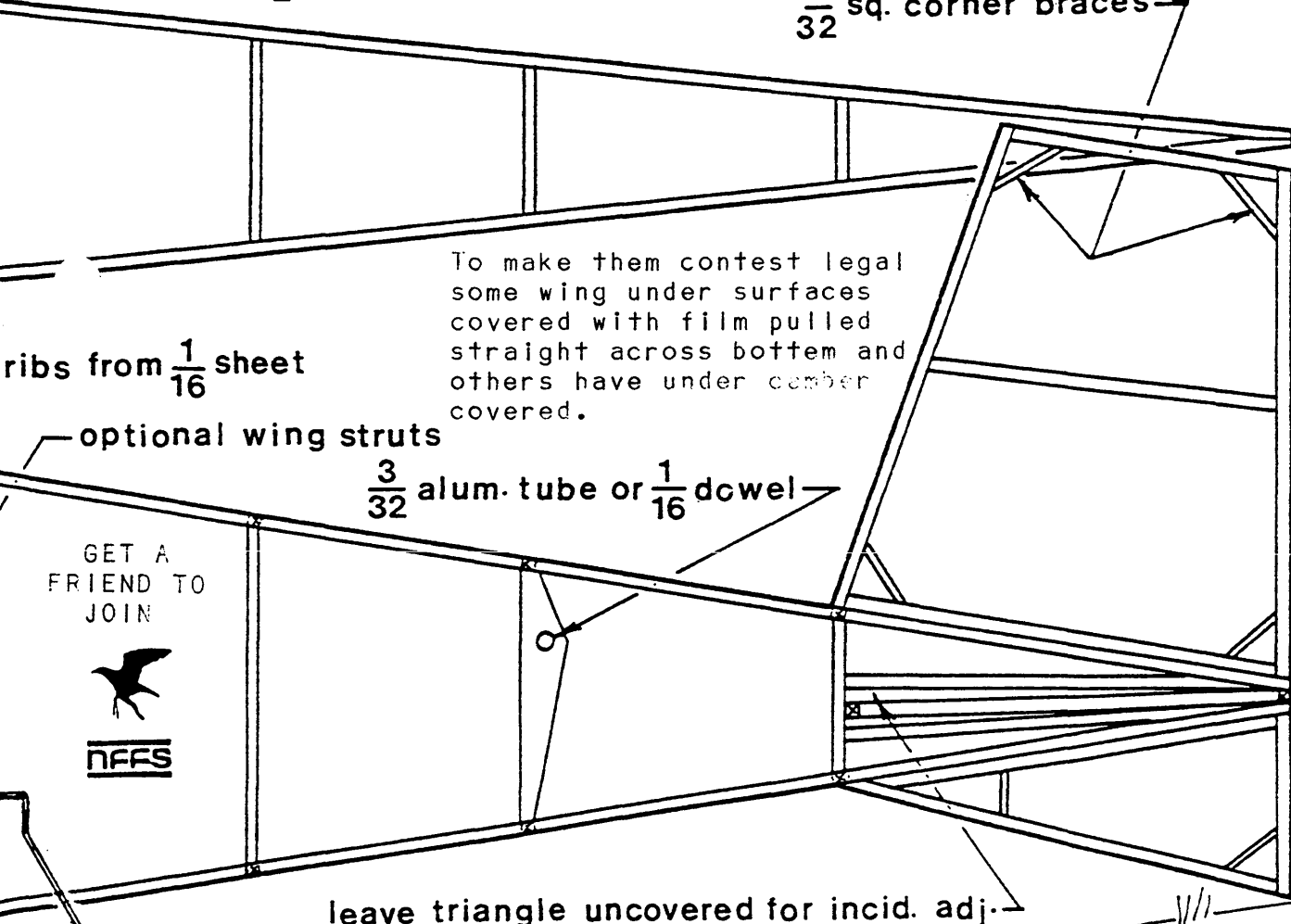
IT IS UGL Y. IT WAS DESIGNED
BY AN ENGINEER. IF YOU WANT
ART VISIT YOUR LOCAL ART
GALLERY.-PJB





5-6 lb/ft³ 1 1/2 dihedral - each tip

3/32 sq. corner braces



ribs from 1/16 sheet

To make them contest legal
some wing under surfaces
covered with film pulled
straight across bottom and
others have under camber
covered.

optional wing struts

3/32 alum. tube or 1/16 dowel

GET A
FRIEND TO
JOIN



NFFS

leave triangle uncovered for incid. adj.

.020 music wire

The Bean Machine

1/16 sq. except as noted

des. & drawn by D.J. Lindley May, 1989

April '92

NATS SCHEDULE FOR INDOOR FREE FLIGHT EVENTS

By Gary Underwood

(Received from Gary Underwood 3-20-92 PJB)

The 66th National Aeromodeling Championships will be held from Saturday June 20 thru Monday June 29, 1992. Indoor Free Flight events will be held Sunday June 21 thru Tuesday June 23, 1992.

An original schedule was drafted a few months ago but had several conflicts in time and event scheduling. A second draft was made with the input from several indoor flyers in the Eastern United States. The Goal was to attract as many indoor flyers with respect to the United States Indoor Championships being held only two weeks prior to these NATS.

AMA has mailed the NATS application and information packets showing a revised schedule, but it still does not reflect the more ideal program that is now in the works.

The following is the schedule submitted to AMA based on the building being open at 7 am to 9 pm. Model processing will begin at 7:30 am. The last flights for competition will be launched at 8 pm.

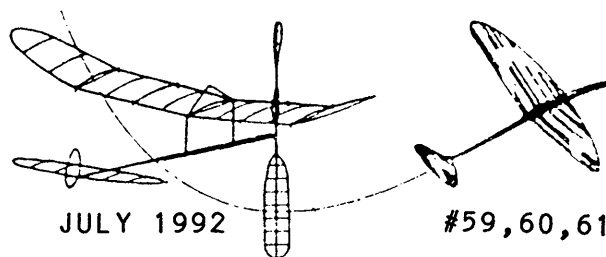
SUNDAY	8 am - 11 am	HL Glider, Catapult Glider
	11 am - 3 pm	Limited Pennyplane
	3 pm - 9 pm	Pennyplane, Manhattan
MONDAY	8 am - 12 pm	Indoor Scale, Peanut Scale
	12 pm - 5 pm	Easy B
	5 pm - 9 pm	F1D (day 1)
TUESDAY	8 am - 12 pm	Bostonian (7gm), Ministick
	12 pm - 5 pm	Intermediate Stick
	5 pm - 9 pm	F1D (day 2)

At present the military has confirmed the building being open until 7 pm. We are pending permission to extend that to 9 pm. No word has been made from the base on the movement of light fixtures suspended from the ceiling. Attempts are being made to reduce obstructions throughout the building.

For further information contact AMA Headquarters.

INDOOR

NEWS and VIEWS



JULY 1992

#59,60,61

EDITOR: PLENNY J BATES, 2505 WHITE EAGLE TRL SE, CEDAR RAPIDS IA 52403. PHONE 319-362-2969
FAX 319-364-7819

FREE FLIGHT NEEDS YOU

The NFFS has a GREAT opportunity for two free flightrers !!

This is YOUR chance to put something back into this great hobby of ours and support those individuals who previously have generously contributed their time for our benefit and enjoyment.

CD/Administrators are needed for both the 1993 US Indoor Championships and the 1993 US Outdoor Championships.

Qualifications are simple: You must be an active model builder/flyer, or spectator and a self-started with a combination of charm, tact, and fairness to work well with other modelers.*

You will have help. You will not be left alone to figure things out by yourself. Guidance will be available from previous job holders. If you do not have a CD's rating we will work on one for you. If you can spare about 2.4789% of your time for one year, you have got it made.

Remember: Without a CD there can be no contest, no 1993 USIC and no 1993 USOC.

Step forward now !!

Contact: Tony Italliano at

(414) 782-6256

(7 to 10 pm Milwaukee time) Ed. note: This is US Central time, the same as the famous Cedar Rapids Iowa Time.

* This is Ideal. In fact you can be as mean as a snake and still get the job done.

NFFS MEMBERSHIP AND RENEWAL APPLICATION Mail to: NFFS 12324 Percival Street Chester, VA 23831 Subscription rates include annual fee of \$50 for membership in the National Free Flight Society. The balance of the fee in each category is for Subscription to FREE FLIGHT, the NFFS Digest. Subscriptions are not available without membership. MEMBERSHIP FEES AND SUBSCRIPTION RATES (1 and 2 yr.)		1 yr. \$15.00 (\$50 membership fee plus \$14.50 subscription) 2 yr. \$27.00 (\$100 membership fee plus \$26.00 subscription)	Ages 19 & over and residents of foreign countries. Ages 18 & under.	Subscriptions are not available without membership. Ages are as of July 1 of the current year. Please circle applicable fees. New member <input type="checkbox"/> Renewal <input type="checkbox"/> Address change <input type="checkbox"/> Current expiration date: Mo. Yr.	AMA# Address City, State Zip
		1 yr. \$7.50 (\$50 membership fee plus \$7.00 subscription) 2 yr. \$13.50 (\$100 membership fee plus \$12.50 subscription)			

Just do it ! Join the NFFS

SUBSCRIPTIONS

The plan is to publish this newsletter four times a year. Subscriptions rates for four issues as follows:

\$ 8.00 U.S.A. Canada, Mexico
 \$ 9.00 overseas surface mail
 \$10.00 Air Mail Europe & S. America
 \$11.00 Air Mail Asia, Australia & New Zealand

Please remit in U.S. dollars by cash, check drawn on U.S. bank, money order using U.S. bank, or U.S. Postal money order. Make checks payable to order of INAV.

Send to: Plenny Bates
 2505 White Eagle TRL SE
 Cedar Rapids IA 52403-1547
 USA

SUBSCRIPTION STATUS

SUBSCRIPTION EXPIRES THIS ISSUE

SUBSCRIPTION EXPIRES NEXT ISSUE

FOR RENEWAL - See rates above

NO X - Indicates at least one more issue. Each full issue will usually be three # e.g. one full issue may be #56, #57, & #58. Check your address label to the right of your name for your expiration #.

BONUS ISSUE BONUS ISSUE

Why? Because there is enough in the savings account to support a bonus issue of 18 pages with 4 pages of photos on coated paper. It would have been prudent to wait for three issues for this but what better time than after the USIC for an over sized issue? As of July first the average subscriber had 4 issues coming and there was more than enough in the account to put out a big issue and three more.

EAST EUROPE

Some subscriptions to East Europe have lapsed, no doubt for good reason. To keep finances in good shape and still continue to serve this important part of the world indoor community those who would like to help please send \$10.00 or \$20.00 to INAV. Note that it is for one or two gift subscriptions. Thank you, PJB

CHECK ON THE EDITOR

The upper right hand corner of the address label has your issue expiration number.
 If # 61 or below this is your last issue.
 If # 62, 63 or 64 the next issue is your last.

PEANUT SCALE - OPEN-	SUBJECT	BEST MAX	2ND MAX	AVERAG BEST	SCALE POINTS	TOTAL POINTS
CD: P. KLINTWORTH						
1 Don Slusarczyk	1911 Voison Hydroplane	142.8	132.0	137.4	148.32	285.72
2 Jack McGillivray	Isaac's Fury	136.7	135.0	135.9	136.71	272.57
3 Jim Miller	1911 Voisin	84.3	82.6	83.4	144.90	228.35
4 Bill Henderson	Bleriot VII	105.6	105.6	105.6	105.60	211.20
5 Roy Bourke	Farman	85.8	79.5	82.7	125.93	208.58
6 Dr. John Martin	Astra Kampferer 1908	85.4	81.2	83.3	121.00	204.30
7 Wayne Trivin	Santos Dumont 14 bis	65.0	64.0	64.5	137.76	202.26
8 Juegen Kortembach	Curtiss P40 Kittyhawk	85.0	80.6	82.8	112.70	195.50
9 Randy Kleinert	Lacey M10	88.0	85.5	86.8	100.80	187.55
10 Dave Rees	Corona Cougar	67.0	59.2	63.1	116.13	179.23
11 Michael Thompson	Lacey M10	88.4	88.4	88.4	88.40	176.80
12 Stan Fink	Fokker D VIII	52.5	41.1	46.8	116.16	162.96
13 George Nunez	Blackburn Bluebird III	68.0	0.0	34.0	128.16	162.16
14 George Nunez	Sopwith Triplane	40.8	0.0	20.4	136.71	157.11
15 Jerry Plassman	Piper J3 Cub	79.0	64.1	71.5	78.96	150.49
16 Stuart Weckerly	Stout 2AT transport	67.2	67.2	67.2	67.20	134.40
17 Joseph Coles	Pietenpol Air Camper	33.0	29.0	31.0	95.89	126.89
18 Mason Plank	Waco Sre Biplane	0.0	0.0	0.0	98.70	0.00
19 Al Backstrom	Payen AP 10 V2	0.0	0.0	0.0	100.32	0.00
20 Carl Hedley	Taylor Cub	0.0	0.0	0.0	107.55	0.00
21 Keith Fulmer	Lacey M10	0.0	0.0	0.0	104.85	0.00
22 Bob Platt	Bristol Scout "D"	0.0	0.0	0.0	93.28	0.00
23 Jim Grant	DNP	0.0	0.0	0.0	-	0.00

PEANUT SCALE - JR-SR-

1 Chris Sydor	Bebe Jodel	47.0	46.0	46.5	64.75	111.25
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- AMA SCALE-----

CD: PHIL KLINTWORTH	SUBJECT	BEST FLIGHT	SECOND FLIGHT	AVERAGE BEST 2	SCALE POINTS	TOTAL
1 Jack McGillivray	SE5	90	90	90.0	97.3	187.3
2 Dave Kees	36" Porterfield 1940	90	90	90.0	91.0	181.0
3 Wayne Trivin	Santos Dumont 14bis	90	90	90.0	87.0	177.0
4 John Blair	Georgia Special	90	90	90.0	85.0	175.0
5 Jim Miller	Lacey M-10	90	90	90.0	84.0	174.0
6 William Passarelli	Nesmith Cougar	90	90	90.0	78.5	168.5
7 Stuart Weckerly	Found Centennial	90	90	90.0	74.0	164.0
8 Al Backstrom	Found Centennial	90	90	90.0	60.2	150.2
9 Millard Wells	Waco Sre	66	60	63.0	77.0	140.0
10 Millard Wells	Stinson SR7	70	68	69.3	69.0	138.3
11 Marion Knight	Taube	48	31	39.6	84.0	123.6
12 George Nunez	Aeronca K	71	42	56.3	81.0	137.3
13 Joseph Coles	Tiger Moth	38	23	30.6	67.0	97.6
14 Michael Thompson	DNP	0	0	0.0	-	0.0
15 Dr. John Martin	Curtiss s3 Triplane	0	0	0.0	86.0	0.0
16 Stan Fink	Loening M-8 Kitten	0	0	0.0	87.0	0.0

- FAI RUBBER-----

CD: A. TAGLIAFICO	BEST FLIGHT	SECOND FLIGHT	TOTAL BEST 2	INTERMEDIATE STICK
1 Richard Doig	00:38:02	00:37:13	01:15:15	1 Lawrence Coslick 29:34
2 Gary Underwood	00:32:29	00:32:17	01:04:46	2 Don Slusarczyk 29:32
3 Larry Loucka	00:32:23	00:31:23	01:03:46	3 Stan Chilton 29:28
4 Laurie Barr	00:31:27	00:31:16	01:02:43	4 Robin Bailey 27:58
5 Bill Hulbert	00:30:17	00:28:56	00:59:13	5 Dan Belieff 27:19
6 Jack McGillivray	00:29:49	00:29:15	00:59:04	6 Gary Underwood 26:57
7 Tom Vallee	00:29:09	00:26:29	00:55:38	7 Dick Obarski 25:47
8 Jess Shepherd, Jr.	00:28:40	00:26:26	00:55:06	8 Bernard Hunt 25:42
9 Jim Grant	00:27:13	00:23:09	00:50:22	9 Laurie Barr 25:12
10 Paul Couture	00:23:05	00:20:10	00:43:15	10 Jim Grant 24:20
11 Vern Hacker	00:26:32	00:16:32	00:43:04	11 Jack McGillivray 23:29
12 Randy Kleinert	00:18:41	00:14:33	00:33:14	12 Bill Henderson 22:18
13 Dan Belieff	00:28:57	00:00:00	00:28:57	13 Dan O'Grady 21:45
14 Stan Chilton	00:28:31	00:00:00	00:28:31	14 Ron Ganser 21:39
15 Edward Burke	00:14:10	00:13:44	00:27:54	15 Randy Kleinert 21:36
16 Bob Platt	00:00:00	00:00:00	00:00:00	16 Joseph Krush 21:35
17 Billie Landrum	00:00:00	00:00:00	00:00:00	17 Howard Henderson 20:06
18 Joseph Krush	00:00:00	00:00:00	00:00:00	18 Larry Loucka 20:03
19 Bernard Hunt	00:00:00	00:00:00	00:00:00	19 Jess Shepherd, Jr. 19:12
20 Terry Cowgill	00:00:00	00:00:00	00:00:00	20 Joseph Nuszer 18:47
				21 Chuck Markos 18:45
				22 Tom Vallee 18:20
				23 Andrew Tagliafico 17:57
				24 John Barker 16:26
				25 John Marett 16:20
				26 Walter Van Gorder 14:46
				27 David Raymond-Jones 09:45
				28 Edward Burke 07:48
				29 Vernon Hacker 04:35
				30 Chester Wrzos 00:00
				31 John Voorhees 00:00
				32 Chuck Slusarczyk 00:00
				33 Wally Simmers 00:00
				34 Phillip Hartman 00:00
				35 Lew Gitlow 00:00
				36 Jim Forward 00:00
				37 Douglas Barber 00:00

- R.O.G. STICK---

CD: ?				
1 Stan Chilton	15:35			
2 Ron Ganser	14:45			
3 Joseph Krush	13:18			
4 Joseph Nuszer	10:43			
5 Dick Obarski	10:22			
6 Vern Hacker	08:18			
7 Tom Vallee	00:00			
8 Michael Thompson	00:00			
9 Don Slusarczyk	00:00			
10 Jess Shepherd, Jr.	00:00			
11 Larry Loucka	00:00			
12 Lew Gitlow	00:00			
13 Lawrence Coslick	00:00			
14 William Bigge	00:00			

KIT/PLAN
SCALE
HANDLAUNCH
&
CATAPULT
GLIDER
SEE PAGE 4

-JR-SR---

1 Peter Kearney (SR)	11:23
2 Chris Sydor (JR)	07:45
3 Kris Forward (JR)	00:03

BOSTONIAN----	BEST FLIGHT	2ND FLIGHT	TOTAL BEST 2	CHAR	TOTAL
CD: DAN BELIEFF					
1 Richard Miller	04:30	04:24	08:54	1.08	576.72
2 Don Lindley	03:42	03:21	07:03	1.10	465.30
3 Stuart Weckerly	03:47	03:34	07:21	1.04	458.64
4 Wayne Trivin	03:39	03:25	07:04	1.08	457.92
5 Bill Henderson	03:23	02:57	06:20	1.15	437.00
6 David Bellenger	03:04	03:03	06:07	1.16	425.72
7 John Marett	03:27	03:06	06:33	1.08	424.44
8 Ron Ganser	03:21	02:58	06:19	1.10	416.90
9 Paul Avery	02:58	02:51	05:49	1.16	404.84
10 Chuck Markos	02:59	02:50	05:49	1.15	401.35
11 Robert Platt	03:07	02:50	05:57	1.08	385.56
12 William Passarelli	02:59	02:38	05:37	1.14	384.18
13 Jim Grant	02:50	02:50	05:40	1.05	357.00
14 John Blair	02:58	02:33	05:31	1.04	344.24
15 Howard Henderson	02:42	02:23	05:05	1.00	305.00
16 Al Backstrom	02:17	02:11	04:28	1.12	300.16
17 Jerry Plassman	02:17	02:16	04:33	1.08	294.84
18 Stan Fink	02:14	02:08	04:22	1.08	282.96
19 Phillip Hartman	02:03	02:02	04:05	1.10	269.50
20 Carl Hedley	02:05	01:57	04:02	1.09	263.78
21 James Zufelt	02:05	02:01	04:06	1.00	246.00
22 C. David Smith	01:55	01:42	03:37	1.08	234.36
23 Millard Wells	01:42	01:40	03:22	1.08	218.16
24 Edward Sullivan	01:41	01:39	03:20	1.00	200.00
25 Kenneth Crump	01:25	01:24	02:49	1.14	192.66
26 Ed Konefes	01:43	01:08	02:51	1.10	188.10
27 John Ganser	01:31	01:10	02:41	1.12	180.32
28 Michael Thompson	02:35	00:00	02:35	1.08	167.40
29 Keith Fulmer	02:14	00:00	02:14	1.07	143.38
30 W. Hewitt Phillips	01:34	00:49	02:23	1.00	143.00
31 John Barker	01:27	00:24	01:51	1.16	128.76
32 Aaron Gower	00:58	00:49	01:47	1.20	128.40
33 Abram Van Dover	01:00	01:00	02:00	1.04	124.80
34 Joseph Coles	01:00	00:00	01:00	1.12	67.20
35 Larry Coslick	00:00	00:00	00:00	1.15	0.00
36 Vito Garofalo	00:00	00:00	00:00	1.10	0.00
37 Chris Sydor (JR)	00:00	00:00	00:00	1.05	0.00
38 Ralph Knight	00:00	00:00	00:00	DNP	0.00
39 David Thompson	00:00	00:00	00:00	DNP	0.00
40 Red Boyles	00:00	00:00	00:00	DNP	0.00
41 Dick Obarski	00:00	00:00	00:00	DNP	0.00
42 Dan O'Grady	00:00	00:00	00:00	DNP	0.00
43 Robert Oppgaard	00:00	00:00	00:00	DNP	0.00
44 John Fellin	00:00	00:00	00:00	DNP	0.00

- R.O.G. CABIN-----

-CD: G. WISNIEWSKI

1 Dan Belieff	22:56
2 Ron Ganser	22:08
3 Joseph Krush	17:21
4 John Marett	13:31
5 Tom Vallee	00:00
6 Don Slusarczyk	00:00
7 Larry Loucka	00:00
8 Jim Grant	00:00

-NO-CAL SCALE-----

CD: JERRY NOLAN

1 Chuck Slusarczyk	06:05
2 Laurie Barr	05:10
3 Lester Garber	04:58
4 John Ganser	04:14
5 Bill Henderson	04:36
6 John Marett	04:28
7 Wayne Trivin	04:24
8 Daniel Baird	04:12
9 Dick Obarski	04:10
10 Louis Leifer	03:52
11 Don Slusarczyk	03:52
12 Howard Henderson	03:52
13 Joseph Krush	03:50
14 Robert Warmann	03:47
15 Bernard Hunt	03:45
16 Dave Robelen	03:39
17 John Voorhees	03:25
18 Peter Kearney (SR)	03:18
19 Ed Konefes	03:00
20 Robert Romash	02:28
21 John Fellin	02:26
22 Stuart Weckerly	02:24
23 Abram Van Dover	01:47
24 Joseph Coles	01:44
25 Douglas Barry	01:13
26 Chris Sydor (JR)	01:05
27 Fred Rash	00:39
28 Jerry Plassman	00:00
29 Joseph Nuszer	00:00
30 Larry Loucka	00:00
31 Vernon Hacker	00:00
32 Lowell Brown	00:00
33 Al Backstrom	00:00

- OLDTIMER STICK--

CD: TONY ITALIANO

1 Don Slusarczyk	23:22
2 Chuck Markos	19:14
3 Wally Simmers	19:12
4 W. Hewitt Phillips	00:00
5 Larry Loucka	00:00

- HELICOPTER-

CD: DON LINDLEY

1 Tom Vallee	09:24
2 Ron Ganser	05:46
3 John Marett	05:30
4 Randy Kleinert	05:25
5 Daniel Baird	03:34
6 Fred Rash	01:47
7 Kris Forward (JR)	00:39
8 Chris Sydor (JR)	00:00
9 Larry Loucka	00:00
10 William Bigge	00:00

FEDERATION ROG--

CD: ED BURKE

1 Andrew Tagliafico	08:43
2 Jim Clem	07:51
3 Daniel Baird	05:48
4 Douglas Barber	05:46
5 Dick Obarski	05:04
6 Wayne Trivin	04:13
7 Erick Sears (JR)	03:42
8 Fred Rash	03:08
9 Gil Coughlin	03:02
10 Joseph Coles	02:33
11 Robert Oppgaard	00:00
12 Tom Green	00:00
13 Stan Fink	00:00
14 Al Backstrom	00:00

-STATE STINGS-

1 WASHINGTON	11:45
2 FLORIDA	09:17
3 TENNESSEE	08:56
4 NEW JERSEY	08:19
5 TEXAS	07:51
6 MINNESOTA	03:42
7 PENNSYLVANIA	00:00

- EASY 8 - OPEN-----

CD: CLIF CLUPEPPER

1	Lawrence Coslick	22:48
2	Jerry Nolin	22:36
3	Stan Chilton	22:11
4	Bernard Hunt	21:53
5	Laurie Barr	21:49
6	Lester Garber	21:25
7	Don Slusarczyk	20:55
8	Jack McGillivray	20:41
9	Walter Van Gorder	20:14
10	Dan Belleff	20:07
11	Wally Simmers	19:51
12	Andrew Tagliafico	19:42
13	John Maret	19:17
14	Bill Henderson	19:07
15	Gordy Wisniewski	19:04
16	Wayne Trivin	18:45
17	Robin Bailey	18:08
18	Randy Kleinert	17:56
19	Jim Clem	18:55
20	Larry Cailliau	18:48
21	John Ganser	18:41
22	Lew Gitlow	18:25
23	Tom Vallee	18:45
24	Stan Fink	18:35
25	Douglas Barber	18:34
26	Mark Vancil	18:30
27	Richard Miller	18:25
28	Howard Henderson	18:17
29	John Barker	18:16
30	Phillip Hartman	18:14
31	Dan O'Grady	18:13
32	Stuart Weckerly	18:24
33	Joseph Coles	18:10
34	Joseph Nuszer	18:08
35	Fred Rash	18:06
36	Robert Oppgard	18:32
37	Dick Obarski	18:31
38	Richard Doig	18:18
39	Daniel Baird	18:16
40	John Fellin	18:10
41	James Zufelt	18:23
42	Vernon Hacker	18:35
43	David Raymond-Jones	18:56
44	Dave Robelen	18:37
45	Robert Romash	18:37
46	Jerry Plassman	18:31
47	Steven West	09:29
48	Kenneth Grubbs	09:28
49	Abram Van Dover	09:06
50	Jim Grant	08:39
51	Dann Campbell	08:10
52	Jack Boone	07:35
53	Tony Italiano	07:32
54	Louis Leifer	07:32
55	Jess Shepherd, Jr.	04:27
56	Paul Couture	02:53
57	Chester Wrzos	00:00
58	Michael Thompson	00:00
59	Edward Sullivan	00:00
60	Chuck Slusarczyk	00:00
61	Manny Radoff	00:00
62	John Nelson	00:00
63	Chuck Markos	00:00
64	Larry Loucka	00:00
65	Terry Cowgill	00:00
66	William Brown	00:00
67	Paul Avery	00:00

JR-SR-

1	Peter Kearney (SR)	18:43
2	Erick Sears (JR)	13:35
3	Chris Sydor (JR)	10:53
4	Kris Forward (JR)	05:03

-- UNLIMITED SPEED--

CD: TOM VALLEE	MPH
1 Lawrence Coslick	13.75
2 Robert Romash	9.74
3 Clifford Culpepper, Jr.	0.00
4 Richard Doig	0.00
5 Bill Henderson	0.00
6 Chuck Markos	0.00
7 Dr. John Martin	0.00
8 Kris Forward (JR)	0.00

PEANUT SPEED---

CD: TOM VALLEE	MPH
1 Chuck Markos	13.28
2 Mike Thompson	9.33
3 Randy Kleinert	0.00
4 Dr. John Martin	0.00
5 Bill Henderson	0.00
6 Millard Wells	0.00

- MINI STICK---

CD: MASON PLANK

1	Joseph Krush	10:20
2	Andrew Tagliafico	09:47
3	Stan Chilton	09:45
4	Lawrence Coslick	09:35
5	Tom Vallee	09:19
6	Jim Clem	09:08
7	Wayne Trivin	08:54
8	Lester Garber	08:48
9	Howard Henderson	08:32
10	Vernon Hacker	08:13
11	Lew Gitlow	08:08
12	Paul Couture	07:56
13	John Ganser	07:50
14	John Barker	07:49
15	John Maret	07:48
16	Richard Miller	07:45
17	Larry Cailliau	07:32
18	Robert Romash	07:30
19	Robert Warmann	07:23
20	Dick Obarski	07:16
21	Don Slusarczyk	07:14
22	Daniel Baird	06:44
23	Bud Tenny	06:38
24	Dave Robelen	06:26
25	Peter Kearney	06:19
26	Douglas Barry	06:17
27	Dan O'Grady	06:17
28	W. Hewitt Phillips	06:15
29	David Raymond-Jones	05:41
30	Wally Simmers	05:22
31	Joseph Coles	04:49
32	Robert Oppgard	04:41
33	Mark Vancil	04:33
34	Stuart Weckerly	04:26
35	Ed Konefes	04:15
36	Fred Rash	03:47
37	Erick Sears (JR)	03:17
38	Jim Forward	01:39
39	Kris Forward (JR)	01:16
40	Chester Wrzos	-
41	Millard Wells	-
42	Walter Van Gorder	-
43	Gary Underwood	-
44	Michael Thompson	-
45	Chris Sydor (JR)	-
46	Robert Platt	-
47	Jerry Plassman	-
48	Mason Plank	-
49	Joseph Nuszer	-
50	John Nelson	-
51	Dr. John Martin	-
52	Chuck Markos	-
53	Billie Landrum	-
54	Randy Kleinert	-
55	Phillip Hartman	-
56	Tom Green	-
57	Jim Grant	-
58	Stan Fink	-
59	Clifford Culpepper	-
60	Terry Cowgill	-
61	Roy Bourke	-
62	William Bigge	-
63	Dan Belleff	-
64	Plenny Bates	-
65	Laurie Barr	-
66	Douglas Barber	-
67	Robin Bailey	-

HAND LAUNCH STICK -OPEN

CD: A. TAGLIAFICO

1	Richard Doig	39:13
2	Bernard Hunt	39:10
3	Don Slusarczyk	37:16
4	Dan Belleff	33:32
5	Stan Chilton	30:55
6	Tom Vallee	29:52
7	Jess Shepherd, Jr.	29:19
8	Jim Grant	28:32
9	Gary Underwood	27:17
10	Vern Hacker	16:19
11	Edward Burke	14:45
12	Manny Radoff	13:12
13	Joe Krush	07:38
14	Bob Platt	00:00
15	Larry Loucka	00:00
16	Billie Landrum	00:00
17	Terry Cowgill	00:00

JR-SR

1	Peter Kearney (SR)	18:32
2	Chris Sydor (JR)	00:00

PENNYPLANE - OPEN-

CD: PHIL KLINTWORTH

1	Howard Henderson	15:53
2	Lester Garber	14:43
3	Gordon Wisniewski	14:38
4	Roy Bourke	14:01
5	Bernard Hunt	13:40
6	Manny Radoff	13:36
7	Jim Clem	13:05
8	Jack McGillivray	12:52
9	Don Slusarczyk	12:42
10	Joseph Krush	12:41
11	John Voorhees	12:15
12	Robert Platt	12:02
13	John Ganser	11:48
14	John Maret	11:31
15	Robert Romash	10:57
16	Robert Oppgard	10:52
17	Phillip Hartman	10:35
18	Bud Tenny	10:19
19	Douglas Barber	10:00
20	Michael Thompson	09:59
21	Joseph Nuszer	09:58
22	Dan O'Grady	09:56
23	David Raymond-Jones	09:51
24	Fred Rash	09:38
25	Billie Landrum	09:33
26	Ed Konefes	09:30
27	Bill Henderson	09:19
28	Mark Vancil	09:18
29	Steven West	09:01
30	Randy Kleinert	08:54
31	Joseph Coles	08:04
32	Jerry Plassman	08:02
33	Jim Jones	07:51
34	Tom Vallee	07:01
35	Tony Italiano	06:57
36	Abram Van Dover	06:29
37	Ed Sullivan	06:17
38	Robert Warmann	06:08
39	James Zufelt	06:06
40	Jim Forward	05:11
41	Chester Wrzos	03:22
42	Jess Shepherd, Jr.	01:31
43	Walter Van Gorder	-
44	Chuck Slusarczyk	-
45	Wally Simmers	-
46	Larry Loucka	-
47	Marion Knight	-
48	Vernon Hacker	-
49	Tom Green	-
50	Jim Grant	-
51	Ron Ganser	-
52	John Fellin	-
53	Lawrence Coslick	-
54	Jack Boone	-

-JR-SR-----

1	Peter Kearney (SR)	12:11
2	Kris Forward (JR)	10:45
3	Erick Sears (JR)	07:29
4	Chris Sydor (JR)	04:57

AUTOGYRO-----

CD: DON LINDLEY

1	Don Slusarczyk	11:27
2	Larry Loucka	00:00

MANHATTAN CABIN--

CD: ABRAM VAN DOVER

1	John Maret	10:57
2	Walter Van Gorder	10:35
3	Chuck Markos	10:17
4	Jim Grant	10:06
5	Don Slusarczyk	09:55
6	Wayne Trivin	09:36
7	Joseph Krush	09:36
8	Ron Ganser	09:16
9	Lawrence Coslick	09:10
10	Paul Avery	09:02
11	Laurie Barr	08:28
12	Richard Miller	08:09
13	Bill Henderson	07:37
14	Stuart Weckerly	07:03
15	Randy Kleinert	08:38
16	Chuck Slusarczyk	dnf
17	Robert Oppgard	-
18	Larry Loucka	-
19	Tom Green	-
20	Keith Fulmer	dnf
21	Joseph Coles	-
22	Plenny Bates	-

LIMITED PENNYPLANE - OPEN

CD: WALT ERBACH

1	Jack McGillivray	13:38
2	Bernard Hunt	13:19
3	Paul Avery	13:05
4	Lawrence Coslick	12:52
5	Lester Garber	12:40
6	Walter Van Gorder	12:16
7	Wayne Trivin	12:11
8	Stuart Weckerly	12:08
9	John Maret	12:02
10	Douglas Barber	11:59
11	Jerry Nolin	11:58
12	Tom Vallee	11:45
13	Gordon Wisniewski	11:45
14	Randy Kleinert	11:43
15	Richard Miller	11:40
16	Bill Henderson	11:36
17	Howard Henderson	11:21
18	Roy Bourke	11:20
19	Bruce Kimball	11:19
20	Jim Grant	11:09
21	Jim Buxton	11:03
22	Bud Tenny	11:00
23	Ron Ganser	10:58
24	Jim Clem	10:55
25	Phillip Hartman	10:53
26	Joseph Coles	10:47
27	James Zufelt	10:34
28	Vernon Hacker	10:32
29	Chuck Markos	10:30
30	Robin Bailey	10:30
31	Larry Loucka	10:15
32	Dick Obarski	10:15
33	Laurie Barr	10:12
34	John Ganser	10:03
35	Jim Forward	09:58
36	Fred Rash	09:39
37	Stan Fink	09:25
38	Robert Romash	09:21
39	Wally Simmers	09:15
40	Jack Boone	09:07
41	Robert Oppgard	09:05
42	Dan O'Grady	08:56
43	Manny Radoff	08:56
44	Ed Konefes	08:50
45	David Raymond-Jones	08:40
46	Michael Thompson	08:24
47	Robert Warmann	08:24
48	Keith Fulmer	08:22
* 49	W. Hewitt-Phillips	8:09
50	Jerry Plassman	8:07
51	Manny Radoff	8:05
52	John Voorhees	8:02
53	Jim Jones	8:01
54	Plenny Bates	7:52
55	Steve West	7:49
56	Marion Knight	7:29
57	John Fellin	7:22
58	John Barker	7:06
59	Harry Geyer	7:04
60	Low Leifer	7:01
61	Chuck Slusarczyk	6:41
62	Ed Sullivan	6:29
63	Tony Italiano	6:25
64	Joe Nuszer	6:10
65	Billie Landrum	5:23
66	Al Backstrom	5:16

* AND DOWN FROM
SAM 86 SPEAKS
LOST PAGE 2 OF
OFFICIAL RESULTS SO
DO NOT HAVE DNF
AND JR, SR. LPP

- ORNITHOPTER---

CD: DON LINDLEY

1	Joseph Krush	10:00
2	Joseph Coles	01:20

KIT/PLAN SCALE-

CD:	BEST FLIGHT	BEST (MAX)	2ND FLIGHT	2ND (MAX)	FIDELITY POINTS	CRAFT POINTS	BEST FLIGHTS	TOTAL POINTS
S.FINK & R.GANSER								
1 Paul Avery	99.0	90.0	99.0	90.0	54.0	36.0	180.0	270.0
2 John Blair	93.0	85.0	86.0	85.0	52.0	33.0	170.0	255.0
3 Richard Miller	110.0	78.0	79.0	78.0	49.0	29.0	156.0	234.0
4 Jim Miller	75.0	75.0	64.0	64.0	52.0	33.0	139.0	224.0
5 Dave Linstrum	80.0	73.0	74.0	73.0	50.0	23.0	146.0	219.0
6 David Bellenger	105.0	71.0	103.0	71.0	42.0	29.0	142.0	213.0
7 Dr. John Martin	77.0	68.0	69.0	68.0	42.0	26.0	136.0	204.0
8 Joseph Coles	40.0	40.0	33.0	33.0	54.0	35.0	73.0	162.0
9 Jack Boone	24.0	24.0	24.0	24.0	42.0	25.0	48.0	115.0
10 Red Boyles	0.0	0.0	0.0	0.0	-	-	0.0	0.0
11 Phillip Hartman	0.0	0.0	0.0	0.0	-	-	0.0	0.0
12 Carl Hedley	0.0	0.0	0.0	0.0	-	-	0.0	0.0
13 Howard Henderson	0.0	0.0	0.0	0.0	-	-	0.0	0.0

HAND LAUNCH GLIDER - OPEN-

CD: DOUG BARBER	BEST FLIGHT	SECOND FLIGHT	TOTAL BEST 2
1 Jim Buxton	71.1	69.2	140.3
2 Bernie Boehm	67.7	67.5	135.2
3 Michael Thompson	65.4	64.7	130.1
4 Wayne Trivin	60.8	54.3	115.1
5 Randy Kleinert	57.6	54.9	112.5
6 Jerry Plassman	55.1	54.9	110.0
7 Bruce Kimball	57.1	51.1	108.2
8 Chuck Slusarczyk	54.4	50.5	104.9
9 Robert Romash	52.8	50.8	103.6
10 Dan Belieff	47.3	46.7	94.0
11 Jess Shepherd, Jr	46.6	45.2	91.8
12 Jerry Dubaka	39.5	37.0	76.5
13 Phillip Hartman	40.6	33.1	73.7
14 Abram Van Dover	24.4	22.9	47.3
15 Mark Vancil	0.0	0.0	0.0
16 Bill Schlarb	0.0	0.0	0.0

HAND LAUNCH GLIDER - JR

CD: DOUG BARBER	BEST FLIGHT	SECOND FLIGHT	TOTAL BEST 2
1 Chris Sydor	52.1	49.7	101.8
2 Kris Forward	16.0	7.6	23.0

HAND LAUNCH GLIDER - SR--

CD: DOUG BARBER	BEST FLIGHT	SECOND FLIGHT	TOTAL BEST 2
1 Peter Kearney	45.6	44.8	90.4
2 Benjamin Knight	38.3	37.5	75.8

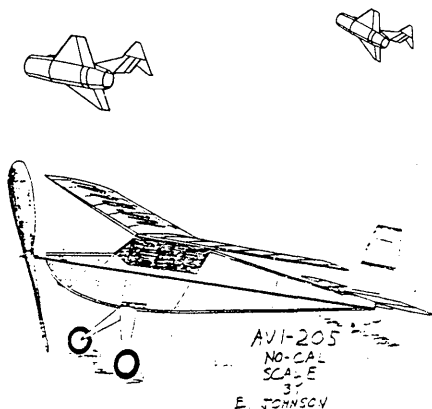
LITTLE KNOWN PLANS SOURCE

FLYING START

10460 AMBASSADOR DRIVE
RANCHO CORDOVA CA 95670

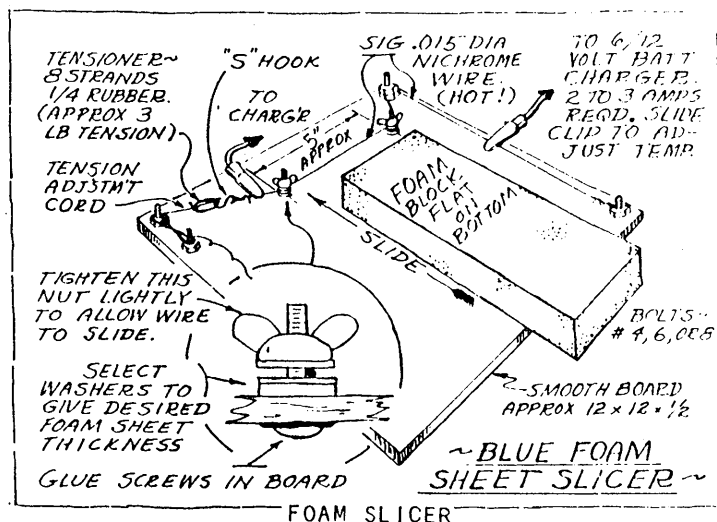
Ernie Johnson makes this business live up to it's name. His plans get a beginner off to a "Flying Start." Most of his stuff is for youngsters which is fine if you have a group of kids to introduce to modeling. He also has several No-Cal plans which are great for adult beginners or as fun flyers for anyone. My favorite is the AVI-205. Yes, there is a real AVI-205 and a copy of the reference to prove it is available for \$2.00. He also has a Baby Ace Model D and a "could be" a real plane the Sky Flyer Racer. We have at least four AVI-205s flying in our group and they all fly well. Ernie details a nice adjustable front bearing on the 205 and I am sure it works well. Here everyone has used a bored out Harlan Penny Plane plg tail bearing mounted on a strip of brass for adjustment ease. This permits loaning a prop to the beginner who has not had time to make up a can formed prop. F.S. catalog \$1.50. If you are in a hurry give Ernie a call at 916-638-2421. Mention INAV.

AVI-205 plan \$1.50, SKY FLYER RACER plan \$1.50, "Z" bearing instructions \$1.50, 3-Views of four (4) Argentine light planes \$2.00. Add 15% post and handling. Best to send \$1.50 and get the catalog.



RESULTS USIC '92

CD: DOUG BARBER	BEST FLIGHT	SECOND FLIGHT	TOTAL BEST 2
1 Chuck Markos	79.7	78.8	158.5
2 Bill Schlarb	79.3	78.9	158.2
3 Ralph Schlarb	77.0	75.8	152.8
4 Dan Belieff	77.4	74.6	152.0
5 Jerry Nolin	73.0	73.0	146.0
6 Michael Thompson	75.5	67.7	143.2
7 Keith Fulmer	69.9	69.6	139.5
8 Mark Vancil	70.9	68.2	139.1
9 Wayne Trivin	68.3	67.7	136.0
10 Ed Konefes	71.8	64.0	135.8
11 Robert Warmann	67.2	66.3	133.5
12 Jim Buxton	67.2	65.1	132.3
13 Vito Garofalo	66.0	65.0	131.0
14 William Passarelli	64.6	63.8	128.4
15 Jerry Plassman	67.0	60.6	127.6
16 Phil Klintworth	65.1	62.1	127.2
17 Gordon Wisniewski	64.1	57.0	121.1
18 Lee Person	58.0	57.6	115.6
19 Fred Rash	57.7	55.6	113.3
20 Bill Henderson	50.9	49.6	100.5
21 Laurie Barr	49.3	48.8	98.1
22 Manny Radoff	53.1	43.7	96.8
23 Stuart Weckerly	48.6	48.2	96.8
24 Arnold Christensen	44.6	43.2	87.8
25 Chris Sydor (JR)	41.0	39.2	80.2
26 Tony Italiano	33.7	31.0	64.7
27 Lester Garber	27.3	25.1	52.4
28 Kris Forward (JR)	25.2	24.2	49.4
29 Chester Wzros	0.0	0.0	0.0
30 David Thompson	0.0	0.0	0.0
31 Jess Shepherd, Jr.	0.0	0.0	0.0
32 Bruce Kimball	0.0	0.0	0.0
33 Tom Green	0.0	0.0	0.0
34 Richard Doig	0.0	0.0	0.0
35 Jim Clem	0.0	0.0	0.0
36 Peter Kearney (SR)	0.0	0.0	0.0

USIC Grand Champion
Don Slusarczyk

from: the Winding Stooze ed. Tom Winter
1010 Eastridge DR, Lincoln, NE, 68510

by Paul McIlrath

Foam block must be fed into hot wire at a uniform rate. Use sliding charger clip to adjust current/temperature to give a comfortable feeding rate and pressure. Fasten board down so both hands can be used to slide block uniformly. Apply enough rubber tension to prevent excessive sag in cutting wire. A little sag doesn't hurt anything. Current sources other than a battery charger could be used if they deliver about 3 amps in the 6 to 12 volt range. I cut sheets 2 ft. long 4 inch wide, down to about the 1/32" thick without trouble. I sandpaper all sheets lightly on both sides (using a block) to improve glue adhesion.

PHOTOS TAKEN AT USIC 1992

Page 7

- 1 Dave Rees - Zippy Sport - Cocoanut Scale
Winner of mass launch.
- 2 Dave Rees - Corona Cougar - Peanut Scale
All of the tissue trim details do not show
- 3 Dave Linstrum - Dornier Komet as built by
Kawasaki - Kit-Plan-Scale - Doc Martin plan
- Krylon silver spray on condenser paper
per plan "Brrm Brrm" don't laugh you do it too
- 4 Jack Boone - Taylorcraft - Kit-Plan-Scale -
Joe Konefes plan for Comet kit
- 5 Paul Avery - (L) Wright Type "L" biplane
(R) waterman Gosling - Pistachio Scale -
Ken Johnson plans
- 6 Paul Avery - Huntington H-12 - Kit-Plan-
Scale - Walt Mooney plan
- 7 Joe Coles - Corbin Super Ace - Kit-Plan-
Scale - Megow plan
- 8 Paul Avery - With a Manhattan but they all
look the same so cut that out - He looks
happy, why not? - Won or did well in
everything he entered - Student of Ken
Johnson, Richard Miller and other top
modelers
- 9 Jim Miller - Scale judge - Big job

Page 8

- 10 Dr. John Martin - Messerschmitt M 20 B -
Pistachio - Time one minute
- 11 Wayne Trivin - Santos Dumont 14 Bis - a
photo cannot do it justice
- 12 Jim Clem - Limited Penny Plane - own design
- 13 Phil Hartman - "Boston Robin"
- 14 Larry Coslick - Unlimited ROG Speed -
winner Rolled tube fuse., Symetrical wing
set 0/0 with stab., 13.5 inch loop 0.180
inch rubber, Peck 6" plastic prop cut to
5.5 inches
- 15 Millard Wells - Ford 2 AT - "Miss Grand
Rapids" - Cocoanut Scale
- 16 Goerge Nenuz (I hope, PJB) - Potez (French
from 1930's)-Cocoanut Scale - # 2 mass
launch
- 17 John Barker - Scimitar - Bostonian - Lives
close to G. Perryman - Just going through
Smyrna GA you can catch the Scimitar
virus
- 18 Bruce Kimbell and Friend - Sorry this was
first picture on roll # 1 and I failed to
get name. Write a letter and a correction
will be in next issue

Page 11

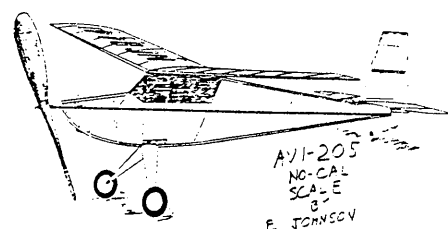
- 19 Laurie Barr - Manhattan - from Great Britain

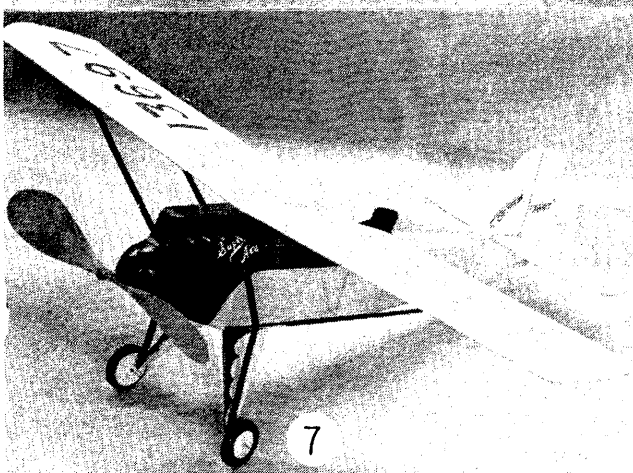
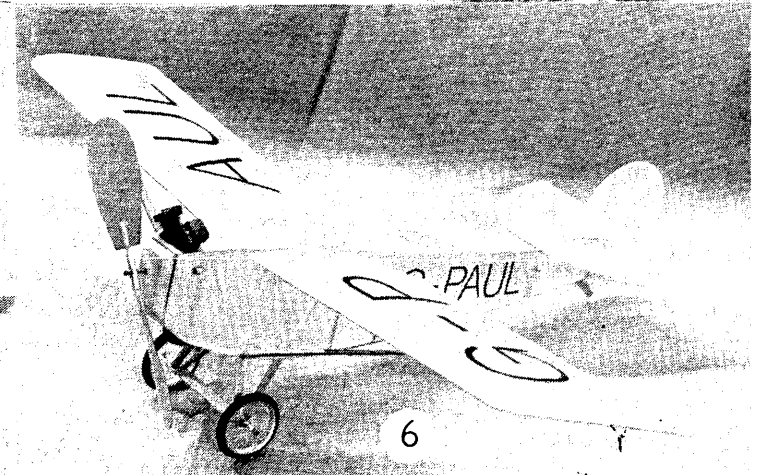
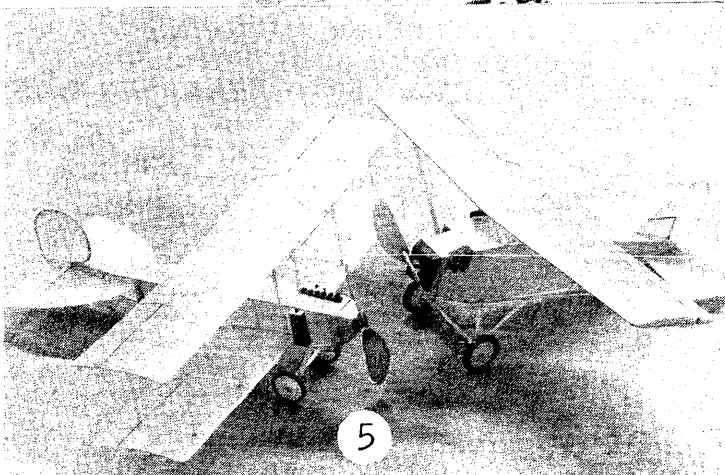
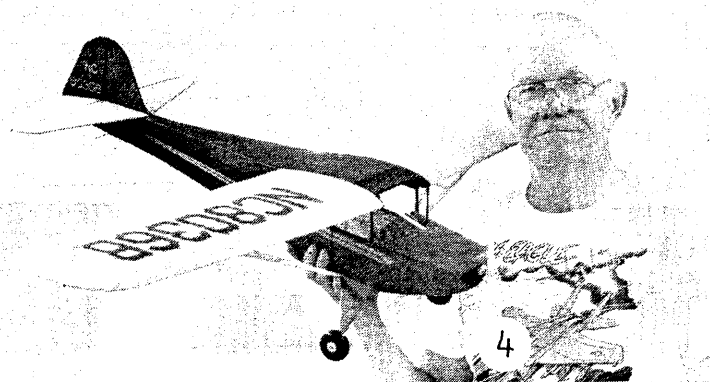
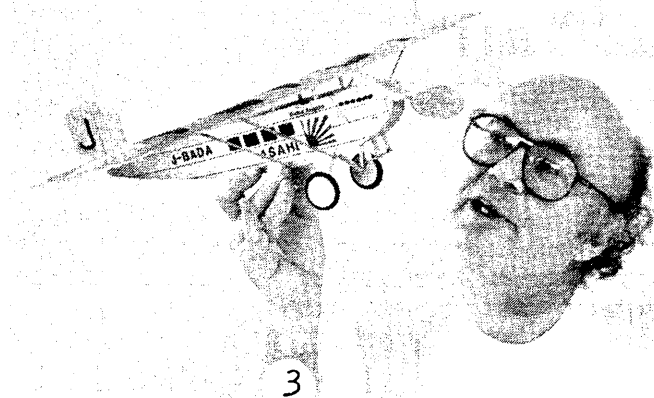
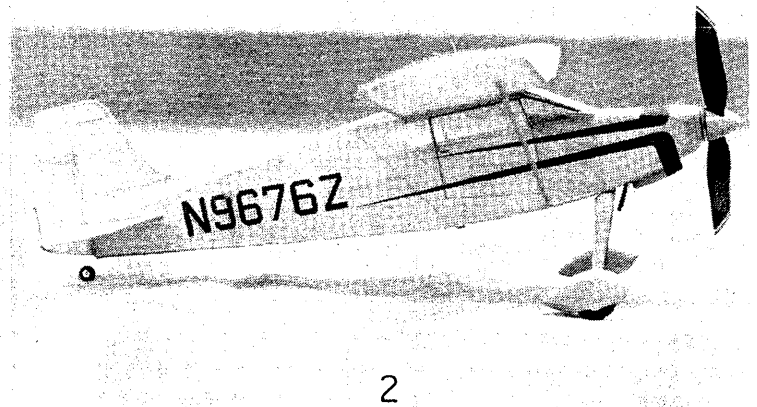
- 20 Les Garber - Open Penny Plane

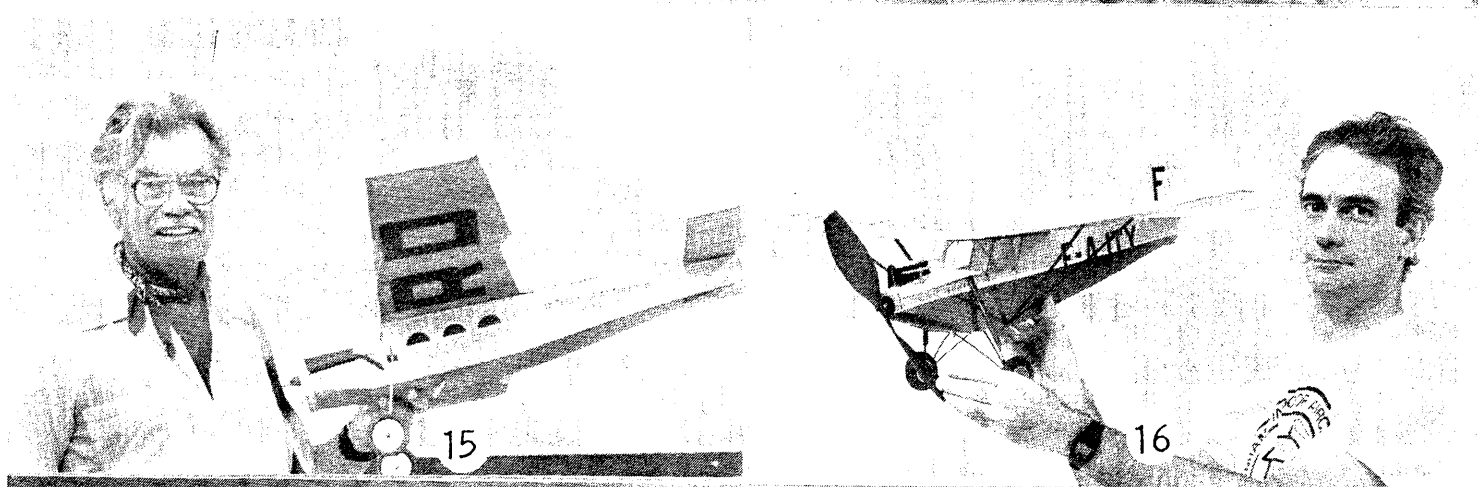
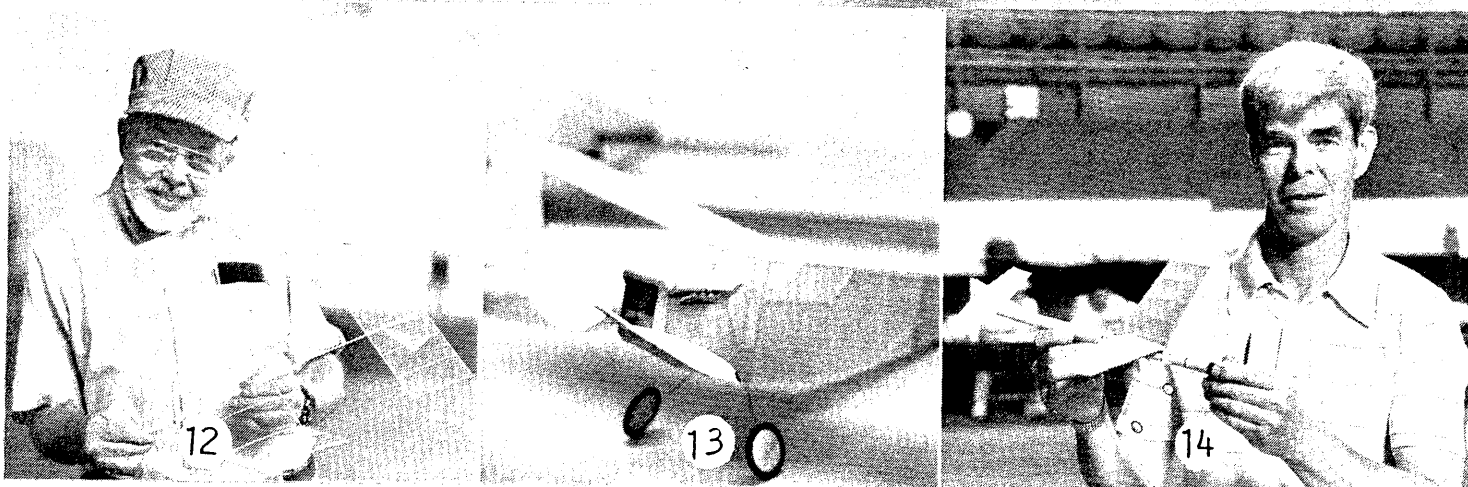
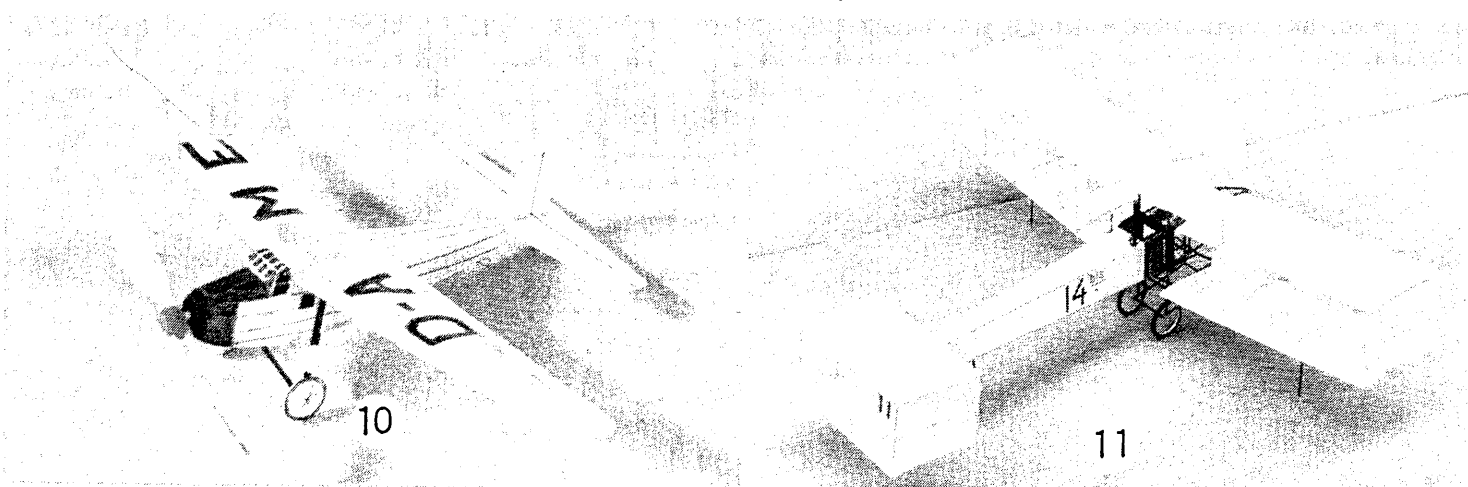
- 21 Ed Konefes - "Red Wing"- Free WW II build
on the plan - First generation Delta Dart
- 22 Richard Miller - Flounder Type Bostonian
of Aronstein type - 4:30 & 4:24 on 57 inch
loop of 0.093 inch FAI Tan
- 23 Jim Miller - PAMA - Golden Age
- 24 Ferrell Papic - Morane-Saulnier (N ?) -
as built for Royal Air Force - Electric
- 25 Jim Forward and his well organized bench
- 26 Stan Chilton checking prop pitch with well
thought out and unique pitch gauge
- 27 Gil Coughlin - P. Payret R. Mauboussin
- 28 Norman Reece - Monocoupe Series 90

Page 12

- 29 Tom Vallee - Two Mini-Sticks - Happy just
did 9:19 Next flight lost in the beams
forever - could not see it from any angle -
International Mini-Stick postal will have
11 countries participating - Tom developed
the mini-stick that was promoted so well by
the late Burr Stanton - He is very happy to
see the continued high level of interest
in the class
- 30 Bill Henderson - Manhattan - Canada
- 31 Dr. Walter Erbach Limited Penny Plane
Contest Director checking wing span on one
of the entries
- 32 Stan Fink - Fokker D VIII - Peanut - Get a
load of that tissue coloring
- 33 Artie Jessup - "Blue Fin" - Bostonian -
Richard Miller design "Flounder" type - see
22 for Miller's credit statement
- 34 Wayne Trivin - Manhattan - see # 11 for
some of his scale work
- 35 Stan Chilton - Mini-Stick - first in mass
launch - Note web below wing
- 36 Al Backstrom - Payen AP 10 - Peanut - Al
had a number of unusual types and all looked
good
- 37 Stuart Weckerly - Stout 2 AT Transport -
Peanut
- 38 Stuart Weckerly - Found Centennial on
Floats - Good flyer have report it flew
even better outside at the FAC NATS







The heart of the model is the duct and fan assembly. The challenge is to make the duct light, truly round, and clean on the inside. Note that I did *not* say "strong". This model was built using the "zero-strength, zero-weight" structural concept. The idea is that if it doesn't weigh anything, it doesn't have to be strong.

Duct construction is by the familiar keel-and-half-shell method, but there is only one stringer on each side. The shape is supported by 90-degree-arc formers that are sliced from sheet, just like wing ribs, but with more camber.

Wings with large root chords (e.g. deltas, clipped deltas, double-deltas) should have little or no camber at the root.

A gentle "S" in the root airfoil will help keep the nose up. Delta wings also require little or no dihedral.

Install the fan *before* building the second half of the duct.

Make the propshaft so that you can get the motor on and off without actually getting close to it, because access will be very limited. Take care to make the fan so that the blades track true, and all have the same pitch. The jig shown on the plan makes it rather painless. Trim the tips so they don't quite hit the stringers.

The duct is covered on the outside only,

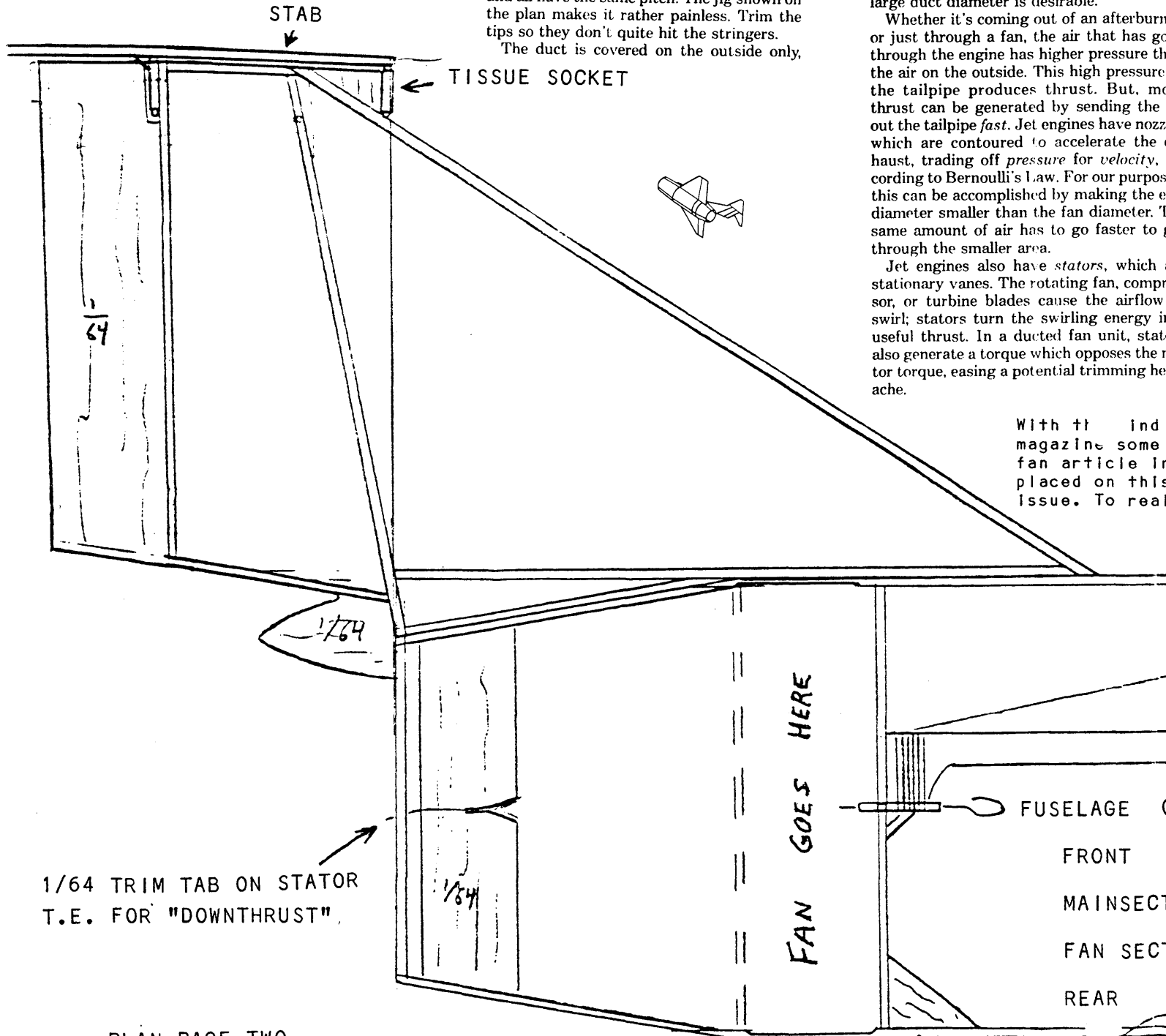
what are the best inlet/fan/exit area ratios? An article in the 1953 *Frank Zaic Yearbook* suggests the following: exit area 50% to 90% of fan area, inlet area 120% to 150% of exit area (but presumably no larger than the fan area). I tried to calculate the optimum exit-to-fan area ratio, but this proved to be "non-trivial". Non-trivial is a word used by mathematicians, and it can mean anything from very difficult, to "I could solve it with a supercomputer", to impossible.

First of all, the more air you put through the engine, the more thrust you get. So a large duct diameter is desirable.

Whether it's coming out of an afterburner or just through a fan, the air that has gone through the engine has higher pressure than the air on the outside. This high pressure at the tailpipe produces thrust. But, more thrust can be generated by sending the air out the tailpipe *fast*. Jet engines have nozzles which are contoured to accelerate the exhaust, trading off pressure for velocity, according to Bernoulli's Law. For our purposes this can be accomplished by making the exit diameter smaller than the fan diameter. The same amount of air has to go faster to pass through the smaller area.

Jet engines also have *stators*, which are stationary vanes. The rotating fan, compressor, or turbine blades cause the airflow to swirl; stators turn the swirling energy into useful thrust. In a ducted fan unit, stators also generate a torque which opposes the motor torque, easing a potential trimming headache.

With this and magazine some fan article is placed on this issue. To read



PLAN PAGE TWO

OF TWO

SPARS ARE 1/16" SQ. ROUNDED ON THE EDGE THAT WILL BE GLUED TO THE BLADE

PITCH GAGE

1/32" HUB PLATES SANDWICHING THE SPARS. EDGES ARE SCALLOPED AFTER HUB IS ASSEMBLED

FORM FAN BLADES ON A PLASTIC PROP

SIDE VIEW OF FAN DURING CONSTRUCTION

SPACER

(BUILDING BOARD)

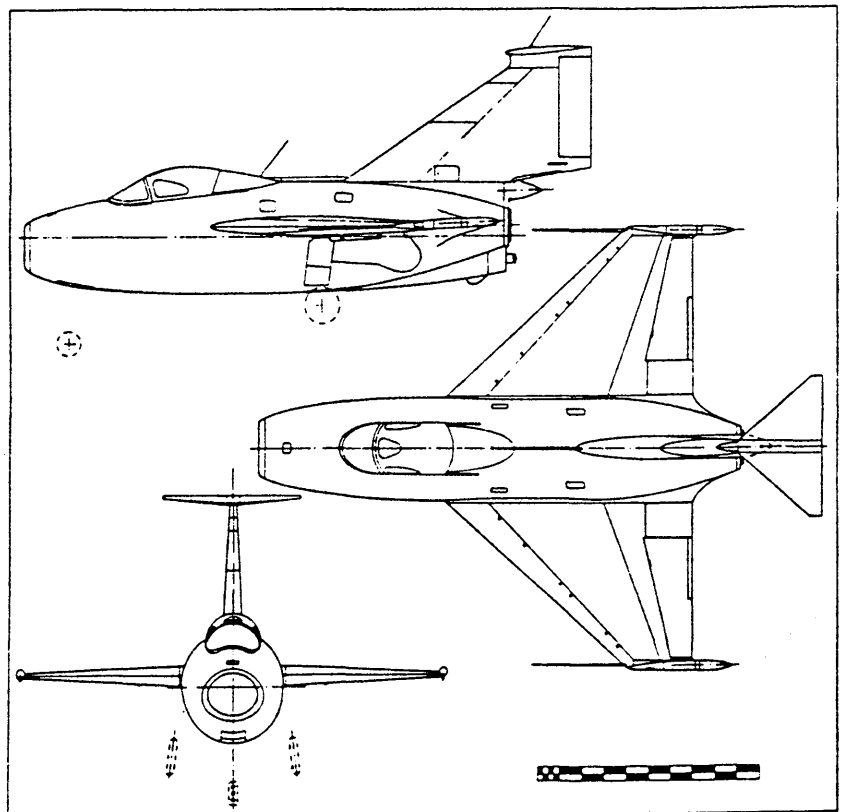
1/64" STATORS (AIR FLOW STRAIGHTENERS) ONE UPRIGHT, ONE ACROSS - PLACE FORWARD OF STATION E. CURL LEADING EDGES UP ON RIGHT SIDE, DOWN ON LEFT SIDE - LEFT ON TOP, RIGHT ON BOTTOM.

STATOR DETAIL

DELTA ONE

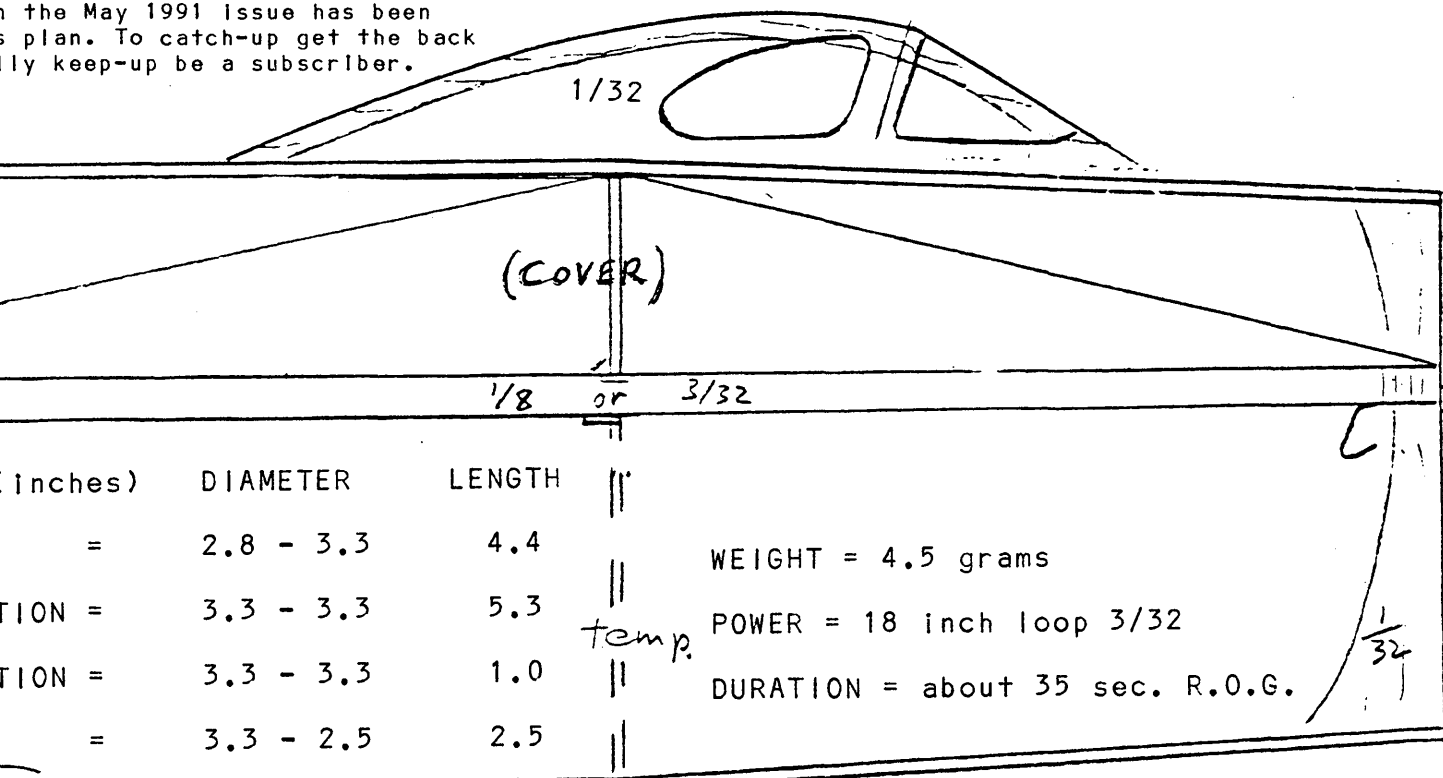
by

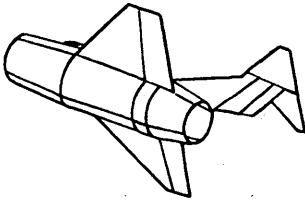
DAVID ARONSTEIN



Delta One

pe ssion of FLYING MODELS
of ine text from Dave's ducted
n the May 1991 Issue has been
s plan. To catch-up get the back
ly keep-up be a subscriber.





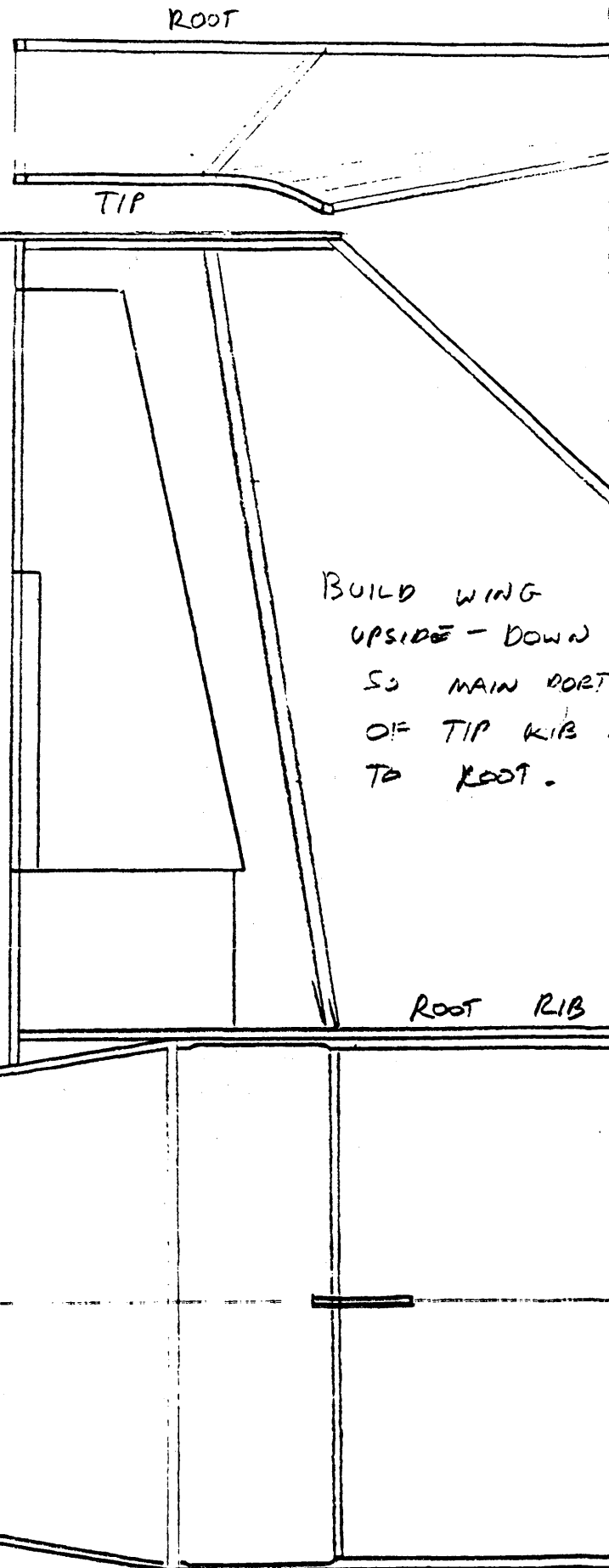
Your editor never liked jets until some of our gum banders with an experimental bent developed semi scale jets that ran on the best power of them all, rubber. Dave has been on the "leading edge" of this research. In real life he has worked for Boeing on, you guessed it, the "leading edge" of wings. At present he is in a PhD program at the U. of Washington. His research involves gas flow.

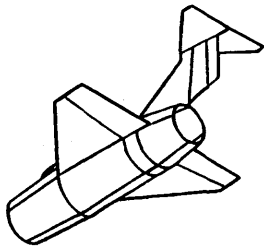
Congratulations are in order to David, Laura and Nathan as David and Laura were recently married.

FLYING MODELS is a great general interest model magazine. Lots of gum band stuff.
 Subscription rates:
 USA & possessions \$23.00/yr \$43.00/2yr
 Canada Postage add \$6.00 and 6% G.S.T.
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 Send to:

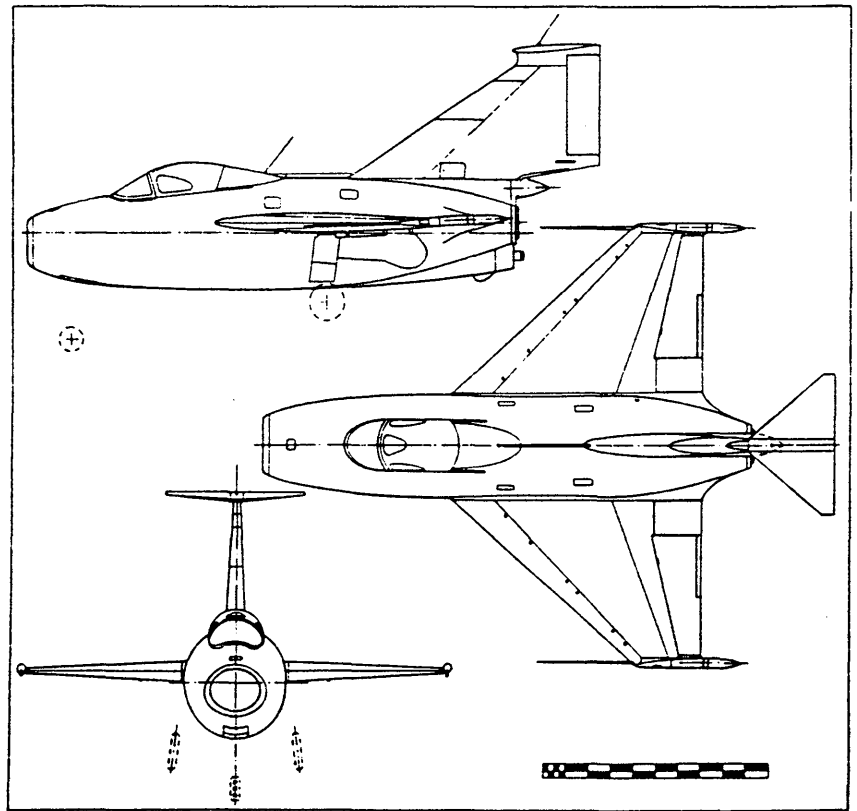
CIRCULATION MANAGER
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 P.O. BOX 700
 NEWTON NJ 07860-0700

PLAN PAGE ONE
 OF TWO





ION
IS PARALLEL



Delta One

DELTA ONE by DAVID ARONSTEIN

PLAN PAGE ONE

OF TWO

FLYING MODELS has a back issue library.
For the ducted fan article and plan write to:
FLYING MODELS
P.O. BOX 700
NEWTON NJ 07860
and ask for MAY 1991 issue. Charge is \$2.50
for single issue. (Canadian add 7% G.S.T.)
Payment by check, Visa, Master Card, American
Express or Optima. For cards include card
number and expiration date.

Indoor Site List CREDITS: NFFS DIGESTK. JOHNSON FIRST IN BOEING HAWKS

Travelling? This list of sites throughout the country was condensed from information sent to me by Gary Underwood. His list included more information on each site.

AZ, Flagstaff	CAT IV, 147'	Red Boyles	602	838-9602
CA, Los Angeles	CAT II	Ken Johnson	818	368-0448
CA, Marin County	CAT II	Tom Brennan	707	938-2893
CA, San Diego	CAT I	Howard Haupt	619	272-5656
CA, San Francisco	CAT IV, 98'	Bud Romak	510	376-4624
CA, Santa Ana	CAT IV, 156'	Curt Stevens	714	586-5779
Canada, London	Bill Henderson	416 481-6972 (Canadian Indoor NATS)		
Canada, Toronto	CAT I	John Marett	416	429-0815
CO, Aurora	CAT ?	John Berryman	303	492-1005
CT, Glastonbury	CAT II	George Armstead	203	633-7836
CT, Norwich	CAT I	Jerry Bockius	203	442-8003
FL, Clearwater	CAT II, 35'	Doc Martin	305	858-6363
FL, Miami	CAT I, II	Doc Martin	305	858-6363
FL, Tampa	CAT III, 67'	Doc Martin	305	858-6363
ID, Moscow	CAT IV, 147'	Andy Tagliafico	503	371-0492
IL, Chicago	CAT III, 84'	Charles Sotich	312	735-1353
IL, Glen Ellyn	CAT I	Don Lindley	708	355-9674
IL, Rantoul	CAT II, 44'	Chuck Marcos	312	945-9225
IL, Sycamore	CAT II	Don Lindley	708	355-9674
IA, Cedar Rapids	CAT II	Paul McIlrath	319	393-4677
KS, Topeka	CAT I	Jack Koehlar	913	272-8439
KY, Louisville	CAT I	Mason Plank	502	634-8191
MD, Greenbelt	CAT I	Tom Vallee	301	498-0790
MA, Andover	CAT II, 40'	Don Walworth	603	898-5338
MA, Cambridge	CAT ?	Ray Harlan	617	353-4013
MI, Detroit	CAT II, 56'	Rich Doig	313	373-5374
MI, Detroit	CAT III, 66'	Rich Doig	313	373-5374
MI, Flint	CAT I	Curt Haskell	313	232-0354
MN, Burnsville	CAT II	John O'Leary	612	888-0638
NJ, Lakehurst	CAT IV	Gary Underwood	609	586-4441
NY, Brooklyn	CAT II	Don Ross	201	568-5272
NY, Buffalo	CAT III, 60'	Jack McGillivray	416	421-1108
NY, Caniague	CAT II	Rich Fiore	516	249-4358
NY, Chappaqua	CAT I	Art Maiden	914	769-2284
NY, Kingston	CAT I	Bob Hudson	518	273-7468
NY, Long Island	CAT I	Bob Bender	212	724-0262
OH, Akron	CAT IV	Bill Hulbert	216	864-8030
OH, Cleveland	CAT III, 50'	Mike Zand	216	524-3480
OK, Oklahoma City	CAT I	Jim Belson	405	946-1093
OK, Tulsa	CAT I	Roy O'Mara	918	815-1424
OR, Albany	CAT I	Bob Stalick	503	928-8101
PA, Bryn Athyn	CAT I	Joe Krush	215	688-3927
PA, Edinboro	CAT II	Lin Reichel	3301	Cindy Lane, Erie, PA 16500
PA, Philadelphia	CAT II	Joe Krush	215	688-3927
TN, Johnson City	CAT IV	Chuck Slusarczyk	216	526-8613
TX, Fort Worth	CAT I	Jesse Shepard, Sr.	817	282-3770
UT, Salt Lake City	CAT I	Jay Jackson	801	485-0314
UT, Salt Lake City	CAT I	Gordon Pollock	801	278-5636
WI, Racine	CAT II, 35'	Tony Italiano	414	782-6256

MOVING ?
SEND NEW ADDRESS TO INAV

From the Boeing Hawks Newsletter, April 1992, Andy Page, editor
Addendum

- NC Charlotte 26' Cat I Every Friday night
Cliff Culpepper, Jr. 704-366-7350
- IA Hudson (Waterloo) 1st & 3rd Thursday
(winter) Mike Carroli 319-345-6711
- IA Des Moines Cat I Night (Day of week ?)
(winter) Jack Textor 515-277-4173
- IL Glen Ellyn (West Chicago) Monday night to
Aug 24 (winter?) Don Lindley 708-355-9674

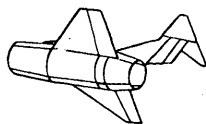
If you have any to add or changes please send to Garry Underwood, 9 Treelawn Terrace, Mercerville NJ 08619 and to INAV. Garry keeps the master list. For the full print out send \$3.00 to INAV. Garry does not have time to reproduce and mail the list.

NEW ADDRESS - JIM JONES

Address:

Jim Jones
36631 Ledgestone DR
Clinton TWP MI 48035

Phone: 313-791-0651



SUPER-FINE TISSUE AGAIN AVAILABLE

This super light tissue of pre-war years (that is 1941 for you kids) is again available to modelers. It is now called GANPI and comes in two forms. The off white E-82 (18x24) and the darker E-81 (20x32). The E-82 is about 0.50 grams/100 square inches. The lightest other tissue in my shop is 0.70 and most current tissue runs 0.80 to 0.90. It takes color very well. I have used red and black KOH-I-NOOR 3080-F universal drawing ink for paper and film. This was thinned with isopropyl rubbing alcohol and applied with an air brush while the tissue was on a rigid frame. The color of the tissue was very even in spite of uneven application. As is usual with tissue full shrinking will not occur while tissue is on a rigid frame. Available from:

AIKO'S ART MATERIALS IMPORT
3347 NORTH CLARK STREET
CHICAGO IL 60657

Phone 312-404-5600 Closed Sunday and Monday

Prices: GANPI E-82 \$4.00 sheet + S & H
GANPI E-81 \$5.00 sheet + S & H

Shipping and Handling \$1.75 + UPS. (In USA expect shipping, handling and UPS to run about \$4.00 to \$5.00)

Payment: Checks (US \$ on US bank). NO VISA

I would encourage a visit to the store if you are unfortunate enough to find yourself in the Chicago area. The store and the service are light years away from the mass market chains. Don Lindley told me where to get and how to color. PJB

INDOOR NEWS CONTINUED

Theodo Andre
Meijhorst 35-43
NL-6537JD Nijmegen
The Netherlands

has taken over production of this fine European news letter from Jorgen Korsgaard. Three issues per year each of 16 pages.
Subscription: two years (6 issues):
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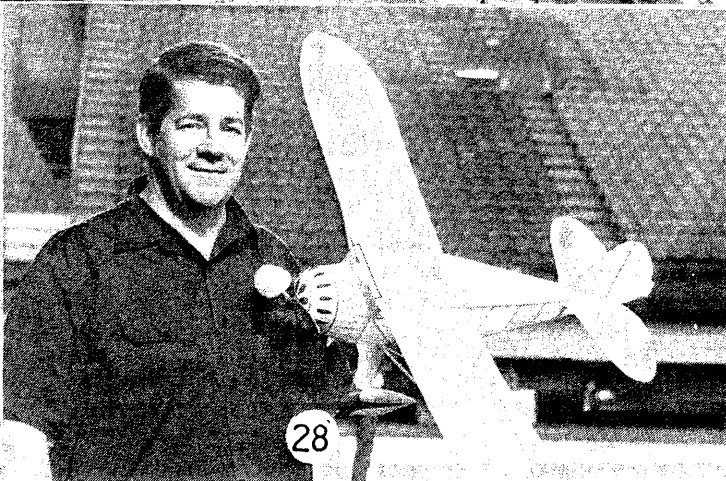
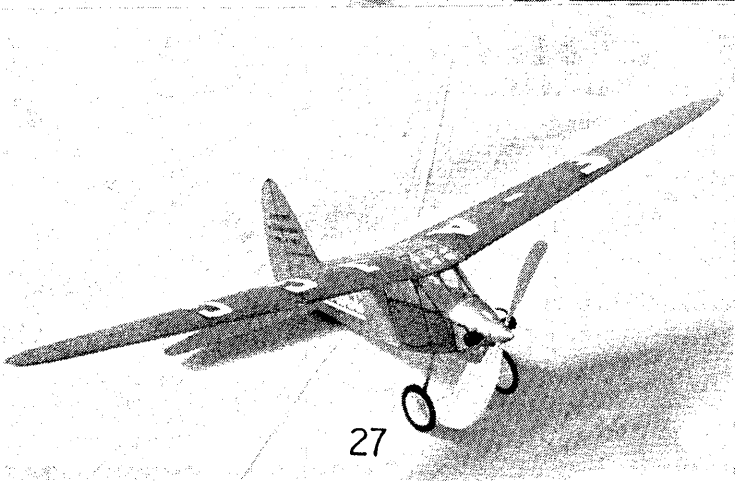
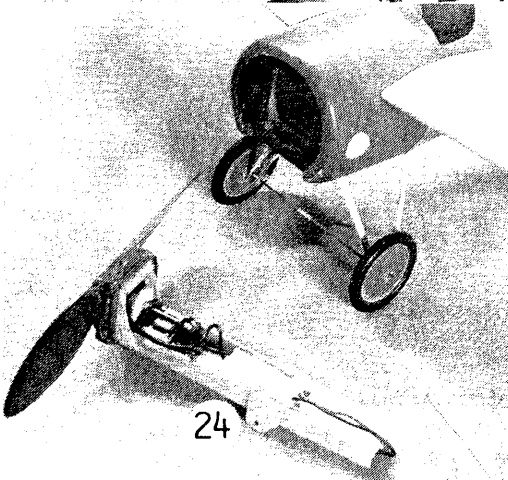
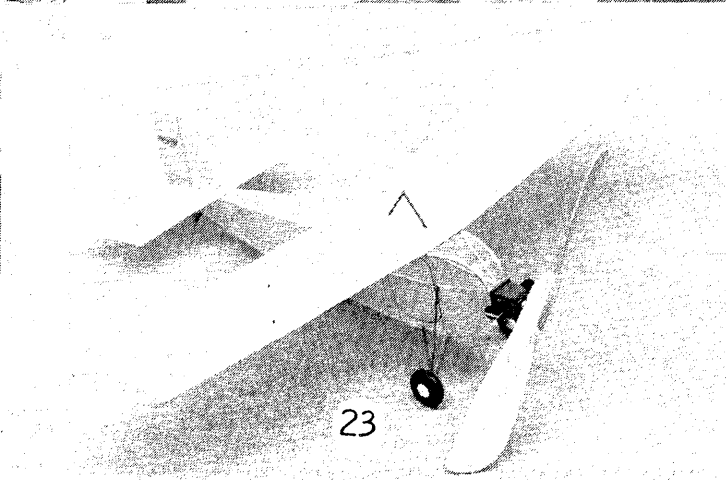
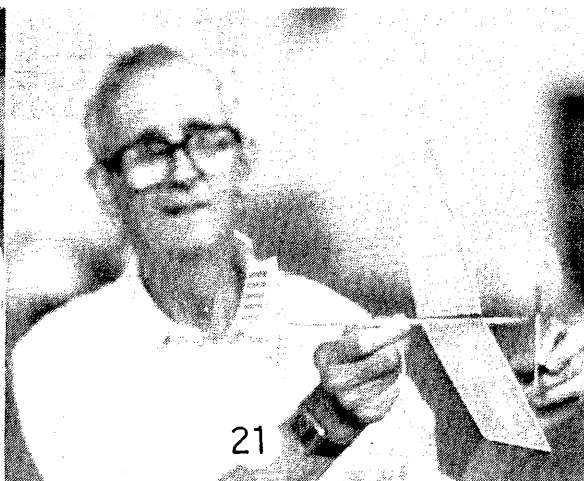
ULTRA FILM CUTTERS

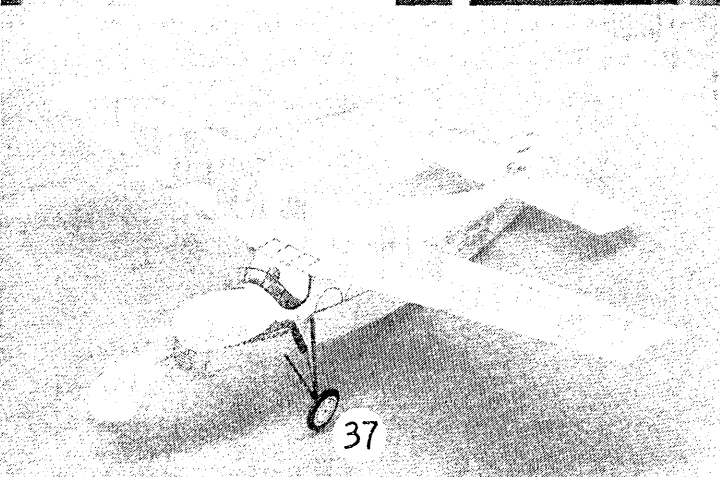
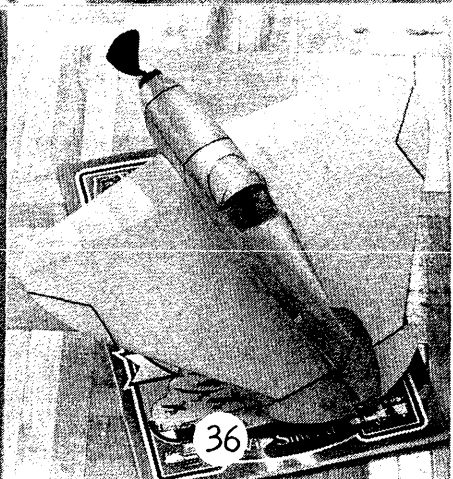
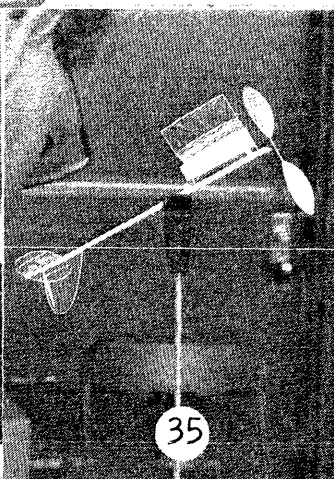
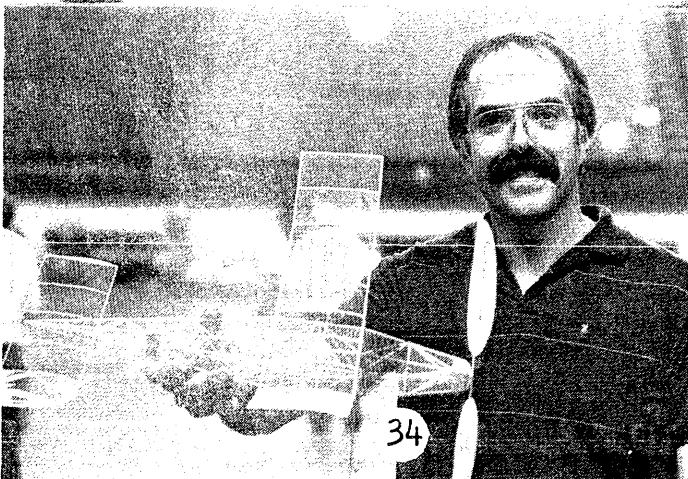
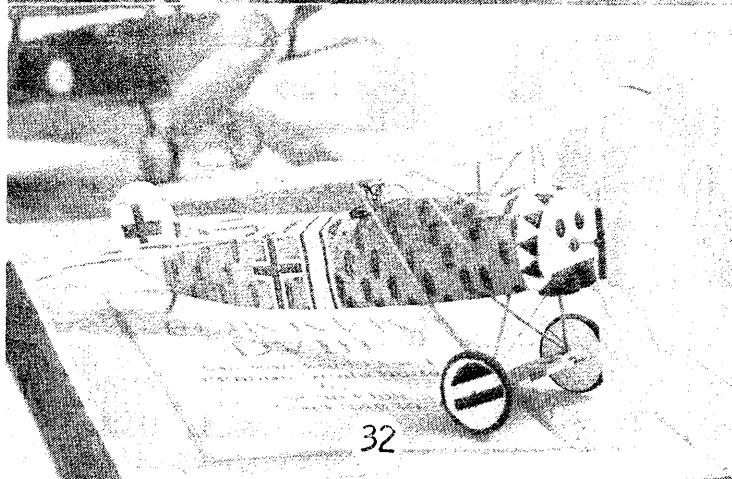
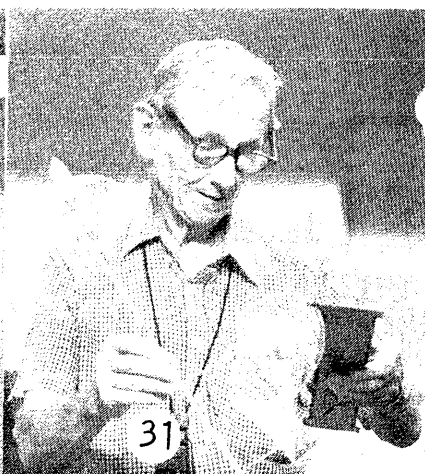
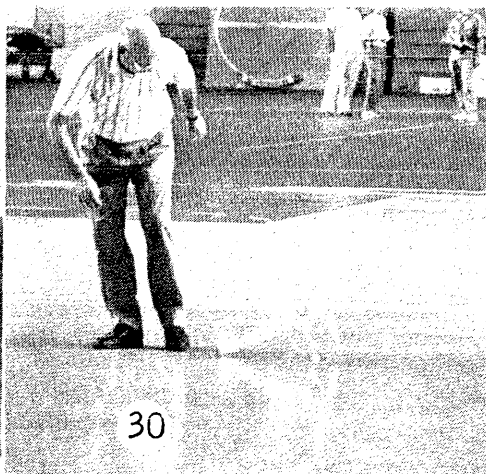
SMALL SCALPELS

Micro Cautery (used in eye surgery) with modification to make call replacement easler ----- \$5.00
Three different types of eye scalpels, very small blades ----- \$3.00
Handling and postage ----- \$2.00
Total ----- \$10.00

Vernon D. Hacker, M.D. US \$ drawn on US
25599 Breckenridge Drive bank or postal
Euclid OH 44117 money order in \$

Vern is a general surgeon but I would not ever be tempted to make the obvious play on words that comes to mind as it is sure he has heard it before, more than once. Nice of Vern to do this for the rest of us.







On June 30, 1991 (on the second day of the competition) I launched my INDOOREE'86 model at 11:50 a.m. After some slight and stalls the model climbed and reached the flat, glass covered ceiling after about 2 minutes 40 seconds. The model started to descend at about 23 minutes. It was needed only two slight steering in about 6 meter flight height by a stick. Than the model landed smoothly. The temperature in the hall was 25 °C (outside about 24°C, little cloudy) and the humidity was 55 % with very small drift, so the conditions were good. (Better than usually in this site, even I was four times over the existing Cat. II. world record in the past three years but with less than 2 % difference. Also a year before I did 36:20 but it was not accepted because we missed the 5 day preliminary claim prescription.)

András REÉ

A LOT OF TROUBLE.

SUMMARY OF THE 1992 AMA NATIONAL MODEL
AIRPLANE MEET INDOOR FREE FLIGHT CHICOPEE MASS
JUNE 21 - 23 by Gary Underwood

Edited: Any errors are my fault PJB.

Nats planing started early in '92 and the first schedule was rather poor with a mixture of time slots that would discourage attendance. Doug Barber and I conferred and I then contacted Chip Smith at AMA Headquarters. (Chip was the Manager and Contest Director for the Nats). He agreed there was time to change the schedule and let me set it up. I talked with a dozen modelers to find out their preferences and assembled a workable schedule along the lines of some recommendations from Rick Dolg.

Now to the site physical problems. The building would not be open long enough for the events to run 100 % smooth, lights hung down 5 - 10 feet from the ceiling, a C5A Simulator was parked in the building, and drafts from some vents were enough to destroy a model.

Each issue required research, telephone calls, and recommendations - all of which needed to be coordinated with the military. The following is how it turned out.

Doug Barber and I arrived the day before the contest began. We met Chip Smith were introduced to Sandy Frank, our coordinator for both Outdoor and Indoor events. We found the hangar with its domed 57 foot high roof with the doors open and a military training exercise in progress. The military had not retracted the lights as requested. THEY HAD REMOVED THE HANGING LIGHTS. Things were looking up. Chip produced a huge roll of plastic sheeting to seal the building. Our military contact Janice Sledge was arranging for two hydraulic lifts to help us seal the building. Minutes later, two tractor trailer size hydraulic "Calaver Cranes" appeared with a team of workers, just for US! I instructed the crew on obstructions to be wrapped and cooling vents to be sealed. They strapped me into a parachute harness and away we all went. Walt Van Gorder and Doug Barber prepared the materials for the military and myself. One hour did the job. Test flights proved the building to be mild.

DAY 1 Sunday June 21

Early A.M. Dan Belleff and Bill Bigge (our Indoor Free Flight Director) arrived to take over my job in running the Nats. The first three places in HL Glider were very tight, see results. Catapult Glider is an unofficial event, but AMA provided Certificates of Performance for those who placed.

OPEN HL GLIDER		TOTAL	
1	Dan Belleff	37.8	36.9 74.7
1	Matt Gagliano	39.3	35.4 74.7
3	Gerald Donahue	36.9	37.4 74.3
4	James Fiorello	31.4	32.1 63.5
5	Vic Gagliano	18.8	20.3 39.1
6	Tony Faranda	17.1	17.8 34.9
JUNIOR HL GLIDER			
1	Chris Sydor	33.3	34.2 67.5
2	Phillip Nault	20.9	20.3 41.2
OPEN CAT GLIDER			
1	Dan Belleff	41.6	40.3 81.9
2	Joe Krush	33.2	33.8 67.0
3	Tony Faranda	24.9	25.8 50.7
JUNIOR CAT GLIDER			
1	Chris Sydor	16.4	17.8 34.2

For the following rubber powered classes there were two main problems. First, the ceiling which either gave you a break or snagged your airplane completely. Second the

weather turned quite sour midway through the contest creating quite a bit of turbulence at the floor. By 11 am the air was beginning to cook in the hangar with minimal drift. Limited Pennyplane was flown between 11 am and 3 pm.

OPEN LIMITED

PENNYPLANE		8 Vic Gagliano		5:57
1	James Grant	11:17	9 Gerald Donahue	6:41
2	T. Iacobellis	10:57	10 H. Keshishian	5:51
3	Bob Nichols	9:37	11 Ed Beshar	5:39
4	Peter Brocks	9:33	12 Doug Barber	2:24
5	Tom Vallee	8:41	JR. LIMITED PENNY P	
6	Matt Gagliano	8:37	1 Chris Sydor	8:47
7	W. Van Gorder	7:37	2 Phillip Nault	4:47

Manhattan was next from 3 pm to 6:30 pm. Competition was stiff for the top places.

OPEN MANHATTAN

1	Joe Krush	8:53	Ed Beshar	DNF
2	Walt VanGorder	8:47	James Fiorello	DNF
3	James Grant	8:46	Tom Green	DNF
4	H. Keshishian	5:10	Bob Nichols	DNF
5	Chet Bukowski	4:38		

Pennyplane flew from 6:30 pm to 10:15 pm (last launch). Wind outside began to cause some drift towards the main hangar doors. A real dual began for the top 5 places that was only finished late into the night.

OPEN PENNYPLANE

1	T. Iacobellis	13:15	8 Peter Brocks	8:33
2	W. VanGorder	11:07	9 Tom Vallee	8:10
3	Jim Fiorello	10:44	Tom Green	DNF
4	James Grant	10:43	James Katz	DNF
5	Doug Barber	10:33	H. Keshishian	DNF
6	Joe Krush	10:18	JUNIOR PENNYPLANE	
7	Vic Gagliano	8:56	1 Chris Sydor	8:29

DAY 2 Monday June 22nd

Several factors contributed to this low attendance by scale flyers. Johnson City (USIC) was just two weeks prior and scale was well attended. The FAC Nats were being held in two weeks and is a big draw for Free Flight Scalars. Many of the individuals I spoke with were already committed to the FAC Nats. Last, a \$25.00 entry fee for each AMA Scale event was imposed early on. At the last minute permission was granted to reduce this to \$5.00. AMA did provide a staff of 15 very professional judges who remained in the building most of the day. The scale turnout was a disappointment but the above gives some of the reasons.

PEANUT SCALE

RUBBER SCALE		1 James Grant	132.90
1	Harvey Pastel	2 Harvey Pastel	81.85

Easy B also was a battle to the end. A lot of hard competition and some real heartbreaks for those who got hung.

OPEN EASY B

1	Dan Belleff	16:30	7 J. Chizmadia	2:58
2	W. VanGorder	15:49	Ed Beshar	DNF
3	James Grant	15:25	Tom Hartman	DNF
4	Tom Vallee	13:51	James Katz	DNF
5	T. Iacobellis	11:48	JUNIOR EASY B	
6	Doug Barber	11:16	1 Chris Sydor	9:41

FID competition was next as the weather began to sour outside. A cold front moved through the area creating some very turbulent conditions inside the building. Test flights were made throughout the evening. Tom Iacobellis, Dan Belleff and Gary Underwood all sustained damage as they collided with the roof. The turbulence began at floor level and continued vertical for approximately 25 feet. The power required to "punch" through this layer ended up carrying you right through the ceiling. Only one flight above 10 minutes (16:04) was posted that evening by Gary Underwood after destroying two models.

DAY 3 Tuesday 23rd

The final rounds for F1D were flown 8 am to 1 pm. Conditions were quite mild and everyone was able to put up respectable flights. Temperatures hovered around the low 70s but humidity was very low 35%.

F1D RESULTS	1	2	3	4	5	6
1 Gary Underwood	4:46	6:33	16:04	25:19	25:17	-
2 Dan Belleff	4:20	19:29	19:06	22:07	21:42	-
3 Tom Vallee	5:44	12:04	7:45	19:21	16:37	23:51
4 Tom Iacobellis	6:27	19:36	20:24	3:29	-	-
5 Joe Krush	13:53	15:22	15:45	18:57	-	-
James Grant	DNF					

Totals: Gary Underwood 50:36 Dan Belleff 43:49
Tom Vallee 43:12 Tom Iacobellis 40:00
Joe Krush 34:42

All entrants except for Gary Underwood were registered for the FAI Team Program and Qualified.

Intermediate Stick had some of the finest weather in the meet. Temperatures soared to 80 degrees and humidity went down to 31%. There was some drift and flyers steered approximately two to three times during a flight to keep the models centered.

OPEN

INTERMEDIATE STICK

1 G. Underwood	21:29
2 T Iacobellis	20:01
3 Dan Belleff	19:29
4 Joe Krush	17:32
5 Tom Vallee	15:03
6 James Grant	13:59
Doug Barber	DNF
John Chizmadia	DNF
JR. INTERMED. STICK	
1 Chris Sydor	11:16

Bostonian and Ministick were our closing events. Competition was tough again but a real fun atmosphere.

BOSTONIAN

1 James Grant	333	Ed Beshar	DNF
2 Gerald Donahue	287	John Chizmadia	DNF
3 Chet Bukowski	284	James Fiorello	DNF
4 Steven Bard	230	Harry Keshishian	DNF
5 Douglas Munn	105		

MINISTICK

1 Jim Grant	7:26
2 Tom Vallee	7:21
3 G. Underwood	4:14
4 Steven Bard	3:31
5 Doug Barber	2:18

SUMMARY : THE 1992 INDOOR NATS WAS A GREAT SUCCESS ! YES IT WAS !

Every entrant had more time than they needed to put up their flights resulting in a relaxed atmosphere.

Many spectators came to watch us - by the hundreds. I watched as every one of my fellow Indoor flyers spent time explaining the intricacies of our art. If you want to know where our future lies it is with good Public Relations and spending time with people who have gone out of their way to come see what we do. Very few of us really stop and reflect on this interaction. On several occasions, I have heard fellow modelers yell and scold an onlooker, rather than explain calmly how to proceed past a fragile model. In my opinion this will kill our hobby quicker than anything else.

The AMA placed a tremendous amount of trust in us. Rather than trying to run the events for us they played the roll of a supporting team. Every suggestion and request we made was 100 % filled. This included set up logistics (described in the beginning) to the acquisition of additional helium and printing

of Award Certificates for our unofficial events. Sandy Frank and Chip Smith came through for us every time we called.

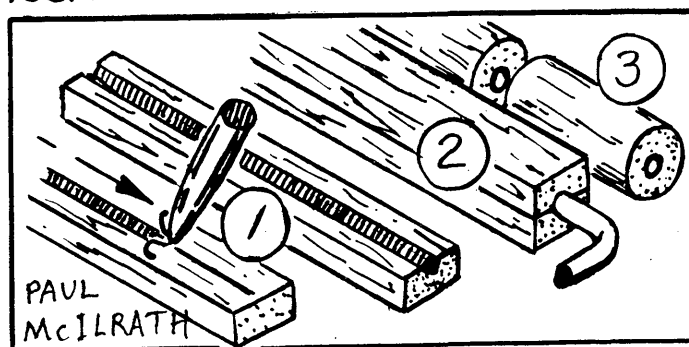
AMA was willing to foot the bill for one of the greatest Indoor Free Flight contests in recent years. We owe AMA great thanks for the efforts they extended.

To make something a success really does not take that much effort if you have a good team. My fellow modelers are allowing a small group of people to set up and run everything for them. The free ride is slowly coming to an end. In order to participate modelers are going to have to share in the work - it worked at the 1992 Nationals.

NATS '92 was not Johnson City, there is only one and it was not West Baden. But it was a great contest with an opportunity to show our stuff to the AMA and hundreds of potential indoor flyers. Indoor is growing and has the potential to be the fastest growing (not largest) part of model aviation. The AMA can help but it up to us to make it happen.

R. O. G. WHEELS - JIM JONES

3/4" DIA. DOWEL, OR DIA.
TO SUIT - SPIRAL WRAP 1/32" X 1/16" OR
SOAKED BALSA STRIP 4 SIZE TO SUIT
OR 5 TURNS
GLUE
JOINT
SINGLE
SPOKE
TAPE ENDS - BAKE OR
HUB MADE FROM "HOT
STUFF"
TUBING
AIR DRY & CUT APART
WITH A SINGLE CUT USING
A SINGLE EDGE BLADE
AS A CLEAVER



To make a small hole down the center of a balsa stick or dowel: in this example, a 1/32 bore in a 1/8 dowel.

1. Take two convenient lengths of 1/16 x 1/8 balsa and scribe a groove down the center of one face of each using a hard pencil or metal scribe.

2. Make scribe marks deep enough to accept a piece of 1/32 music wire as shown. Grease or wax the wire lightly, then glue and clamp the strips face to face with the wire in place. As the glue dries, twist the wire occasionally to be sure it doesn't lock in place.

3. When glue is dry, sand the strip round and cut off lengths to suit your application.

Indoor may not be for everyone but it sure is for a lot more modelers than the current flyers. There are three basic problems. (1) The mistaken belief that Indoor is "hard." This is true only if you want to beat all the rest at the USIC. (2) As it is not \$\$ driven Indoor has only pockets of activity based on personal contact. (3) Perceived lack of flying sites. Perceived because most communities have several suitable sites. That does not mean they can be had without effort but with the correct approach one can be obtained. The following is the story of an R/C (ugh) modeler in Des Moines* who knew in his heart there was something better and went after it. Jack Textor also computer generated the "Indoor News and Views" text in the logo and the "subscribe here" for my colorful yellow Tee shirt. In short Jack is a "DOER."

You don't need brains, money or connections to uncover an indoor flying site. You must have a strong desire to fly indoors and some friends to help you get started. My desire started two years ago when I attended a Delta Dart fun fly with my kids. It was amazing to watch those little things fly almost endlessly around the gym. To acquire a site just "DO IT". We wasted two years just talking about how great it would be to fly indoors on a regular basis. You first must figure out what your needs are. It was obviously best to have a high ceiling and a large area. Also if the site could be centrally located and easy to get to for everyone. Our first contact was with the principal at a local grade school. She directed us to the person in charge of our local Adult Education programs. We then explained to this fellow just what we wanted to do and the ideal time schedule. We were ready to demonstrate how harmless these "things" were but that wasn't necessary. The school system then issued us an informal contract and requested that we indemnify them in the amount of \$300,000. The fee charged was a reasonable \$1.50 per session. Time was short and the AMA was most helpful by faxing us our flying site insurance certificate. An announcement was made at the club meeting and then we got on the phone calling all flying friends for their support. The whole process took only about three weeks. We are already planning out a fall/winter schedule and looking forward to many minutes in the air.

Jack Textor

*If it can be done in a backward place like Des Moines, Iowa it can be done anyplace. Submit your story of how you got a site. Help get the word out that it can be done.

How do YOU get the word out?

Put on demonstration for your local R/C club. Show them your best and also beginner level NO-CAL, beginner level Penny Plane or PP like stick models and a kit-plan-scale or Peanut. Fly a MINI-STICK or LPP for them. If you back down to a level flight torque they will fly in almost any room. Impress on them that this is not all F1D and that most modelers after learning a few skills can be fair to good Indoor builders.

Put together a packets of information of the how-to of Indoor. Make 5 to 25 copies of articles on adjustment, torque meters, use of torque meters, building tips and anything else you think might be of interest. Keep each one in a separate folder and pick the ones that will interest your particular future Indoor flyer.

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Nearly 1000 unique recipes from across America

23 pages of trail foods and 352 pages of good food to be prepared at home. Make no mistake this is a big one. Note everything has been tested in Iowa kitchens. That is correct, Iowa the home of much of the good food you eat. The handy spice guide and the hints for the novice cook are free with each book.

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Paul Avery - Kit Plan Scale - Notes on '91
USIC winner AND '92 SEE PHOTO PAGE 6

19" Piper Vagabond built for the event. Based on 16" Mooney plan. Finished model came out at about 8 grams. With it's generous wing area this model had no difficulty flying the 1:40 maximum time for this event.

All balsa was 5 to 7 pound range and I follow the rule of using the lighter weight when in doubt. This drives total weights down rather than up. Wheels and nose block were made of blue foam, although the nose block could have been balsa as needed some nose weight. Window material was automotive window tinting film, available from auto parts stores or detailing shops. The clear backing is peeled away and either the clear or tinted sheet may be used. Both pieces have a very low tack which is helpful for trimming and placement.

Most significant weight savings resulted from covering with dyed condenser paper. This probably reduced weight by 1 -2 grams as compared to tissue. I find condenser paper fairly easy to use as a cover as it adheres to the framework much quicker than tissue. The major drawback is clearly in the dying process. I tape the sheet to a flat surface and preshrink with alcohol. Then spray on thinned (50/50) Dr. Martin's watercolor dye with an airbrush. The problem arises when the damp paper wrinkles and the dye collects in the low spots. When the paper shrinks back and is taut, the resultant color is often very streaked. Several attempts with different condenser papers and different colors have given very different results. The yellow dye for the Vagabond seems to work the best with the color distribution and vividness being far superior to that of colored tissue.

The goal was a model that would easily fly the two flights of at least 1:40. After a quick test flight I promptly logged two flights in the 2 minute range. The model provided a gratifying first place, exceeding all my expectations. From letter by Paul errors are mine PJB.

INAV JULY '92 ADDENDUM # 59,60,61

for U.S.A., ~~Read the 1992-1993~~ readers only. As this issue is just under two oz. sending this overseas would brake the INAV budget. The July issue of Indoor News and Views is now at the printer. There are a few things that didn't get in for reason of running out of space or losing the material in the stacks of stuff that grow from every table and the floor at paste up time. Lost were the results of the FLYING ACES CLUB section of the U.S.I.C. '92. They were supplied by James Miller who did service as the scale judge for many of the U.S.I.C. scale events. Found them about six hours after the paste up went to the printer.

Quality of the photos taken at the U.S.I.C. has been a worry for your editor since before buying the film. A letter to Bob Clemens who just finished a career at Eastman Kodak as a photographer resulted in more advice on how to take photos in the Mini-Dome than I could absorb. Some of the material went direct to my photo laboratory. Bob knows the Mini-Dome well as he did the photo coverage for Model Aviation of the world championships/USIC/Nats held there. I followed his advice as much as possible and out of 85 shots got about 80 negatives with reasonable exposure. Of these 50 looked good enough to publish and were cropped and printed to the size needed for the photo pages. 38 made the cut off and were pasted up. At this stage \$150.00 had been spent and I had hopes of photo pages that looked like the ones in the MAX-FAX newsletter. Enter grim reality, checking with a friend in the graphics arts business who does things like the art and layout for annual corporate reports learned that 150 line screen was desirable. The screen results in the dot pattern you can see on printed pictures. It was at this stage I found out that my printer used a 110 line screen. And that a finer screen would result in poorer not better reproduction with his printing presses. Calls to the Washington, D.C. area revealed that the MAX-FAX printer uses a 133 line screen. So there you have it. If the photos look like dog doo-doo it is my fault for not doing enough research in the right areas.

!!!!!! SIGN UP A NEW MEMBER !!!!!!!
I.N.A.V. is a non profit operation so more members mean a better newsletter in terms of bonus oversized issues, photos, or extra "free" issues. The effort will be to bring full value for the \$8.00 subscription fee. The first 50 new subscribers may start with this issue (July '92 U.S.I.C. result issue) or the next issue.

FRANK HAYNES

Veteran Indoor flyer Frank Haynes has been admitted to a nursing home in the New York City area. He and his wife Carle would appreciate it if members of the Indoor community were to send "Hello" cards to raise his spirit. Address:

Jewish Home for the Aged
100 West Kings Bridge Road
Bronx NY 10468

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LAKEHURST

AV results at the 1992 U.S.I.C.

Biplane	Scale	Fly	Total
D. Slusarczyk	53 1/2	82 1/2	136
Doc Martin	45	67	112
George Nunes	52	53	105
Jim Miller	53	45	98
Stan Fink	51 1/2	42	93
John Blair	51 1/2	41	92 1/2
Wayne Trivin			DNF
Willard Wells			DNF
Mason Plank			DNF
			DNF

Hi-Wing Monoplane	Scale	Fly	Total
Michael Thompson	50 1/2	82 1/2	133
Jim Miller	53 1/2	77	131
D. Slusarczyk	56	71	127
Dave Rees	62 1/2	63	126
Joseph Coles	54	71	125
Stan Fink	52	73	125
Geo. Nunes	53 1/2	65	118
Willard Wells	50 1/2	66	116
John Blair	52	62	114
John Martin	49 1/2	64	113 1/2
John Martin	46 1/2	57	103 1/2
Carl Hedley	50 1/2	66	116 1/2

Golden Age (1920-1940)	Total 3 flights
Stu Weckerly	5:47
J. Kortenbach	5:28
John Blair	4:58
Jim Miller	3:47
Willard Wells	3:13
Dave Linstrum	3:00
Geo. Nunes	2:17
John Martin	1:55

WTI Combat	
Larry Loucka	DH-6
J. Kortenbach	?
Willard Wells	?
Stan Fink	
Jim Miller	
Stu Weckerly	
Geo. Nunes	



CD: WALT ERBACH		BEST	
LIMITED PENNYPLANE - JR-FLIGHT		FLIGHT	
1 Erick Sears	(JR)	09:11	
2 Chris Sydor	(JR)	08:14	
3 Kris Forward	(JR)	04:31	

USIC 1992

CD: WALT ERBACH		BEST	
LIMITED PENNYPLANE - SR-FLIGHT		FLIGHT	
1 Peter Kearney	(SR)	11:58	
2 Benjamin Knight	(SR)	00:00	

OTHER OPEN FLYERS NOT LISTED IN INAV

Chester Wrzos	Lew Gitlow
Mark Vancil	Clifford Culpepper, Jr.
Abram Van Dover	Dann Campbell
Don Slusarczyk	Edward Burke
John Nelson	John Blair
Ralph Knight	William Bigge
Tom Green	Douglas Barry

16TH WORLD CHAMPS WROCKAW POLAND '92

WORLD CHAMPIONSHIP 1992

	Best two	Total
1 Sylwester Kujawa (Poland)	43:35	41:53 85:28
2 Rene Butey (Swiss)	40:25	40:08 80:33
3 Cezar Banks (USA)	39:52	38:22 78:14
4 Richard Dolg (USA)	39:19	36:46 76:05
5 Lutz Schramm (Germany)	37:01	37:33 74:34
15 Larry Loucka (USA)	33:27	31:51 65:18

Team standings:	1 Poland	221:50
	2 USA	219:37
	3 Germany	212:46

A total of thirty-six (36) competitors were from thirteen (13) countries. As this was a phone report from Gary Underwood it may contain errors. PJB

FAI WORLD RECORD CAT TWO or Bob Randolph does it again

Andy Tagliafico set up a record trial in Seattle prior to the July meet at the Kibby Dome. Site was a Navy Reserve Training Center with offices in use around the perimeter during the trial. Needless to say not all doors remained closed during the flights. The new record set by Bob is 37 min. and 12 sec. He used three flights 1st 32+ min., 2nd 6.5 min. (steering problem) and the third good one. All flights needed a lot of difficult steering. Model was a F1D stick and tail with a wing span of 35 inches with wing area the same as his F1D ship. Wing had more camber inboard than outboard with a generally slightly thinner section than his F1D. Prop 23" D 36.5" P with variable pitch. Boron outline and ribs were used. The V.P. had two screws one for high pitch and one to adjust preload tension. Reached top in 3 min. and ceiling scrubbed for only 3 min., the rest was on the way down with a very long cruise. Prop RPM ranged from 30 to 36. Site time was so short Bob never got to check remaining turns.

MINI-STICK AKA Living Room Stick

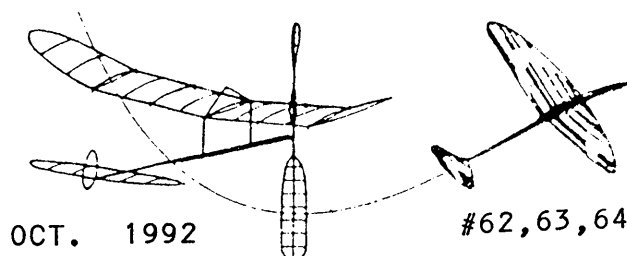
The big news in Indoor '91 and '92 has been the success of MINI STICK. Not only the remarkable performances by the experts (see USIC results) but the numbers entering postal contests. Some of the times are not great but I am sure that many of these contestants are flying their first light model. Tom Vallee has been doing a good job of promoting the event. Join the postal fun. Write Tom at: 444 Henryton S, Laurel MD 20724. So there is no confusion Tom wants everyone to know that MINI-STICK and Living Room Stick are the same.

FOR INFORMATION ON FLYING AT LAKEHURST CONTACT: G. UNDERWOOD, 9 TREE LAWN TERRACE, MERCERVILLE, NJ 08619

INFORMATION

INDOOR

NEWS and VIEWS



OCT. 1992

#62,63,64

EDITOR: PLENNY J BATES, 2505 WHITE EAGLE TRL SE, CEDAR RAPIDS IA 52403. PHONE 319-362-2969
FAX 319-364-7819

FRANK B. KIESER
1921 - 1992

A 1941 graduate of New York University he was an active athlete, competitive rowing extending to 1973. An aeronautical engineer he was a long time employee of G.E. From '73 to '83 he was research adviser to the Mechanical Development Lab at Nelo Park OH. Frank defined the modern indoor ornithopter. His biplane canard pusher held CAT I, II, III, and IV records as of 5-92. He gave credit to others for its' elements but it was Frank who made it all work. Committed to the structure that supported competition he was editor of Indoor News And Views prior to his illness. Our sympathy is extended to his wife of 48 years, Elizabeth and other loved ones.

Two well known East Coast modelers have recently passed on.

MERRICK ANDREWS was the first Indoor modeler to exceed 30 minutes (1953) and in 1972 world Indoor champion. He will be best remembered by his friends as one who was always willing to share information and always made time to help other modelers.

FRANK HAYNES a veteran Indoor flyer who was reported seriously ill in the last INAV succumbed to amyotrophic lateral sclerosis recently.

Our sympathetic thoughts are with the relatives and friends of Merrick and Frank.

ASK ASK ASK

The St Louis gang fly on a regular basis at Jefferson College Gym. They get 8 to 10 four hour sessions a semester for the reasonable price of \$10.00. They got the site by talking to the Dean of Adult Education and he set it up as a flying class. Jefferson is a tax supported Jr. college and no doubt the dean believes it is a duty to make fullest use of the facility. And the St Louis flyers did the right thing they ASKED.

ASK ASK ASK

MYSTERY MAN IDENTIFIED

The fellow pictured with Bruce Kimball in the July issue was Andy Tagliafico. And nobody was going to tell me. I thank Boyd Felstead of Australia for breaking the silence. PJB

NFFS NEWS

1992 10 models of year. AMA Indoor: Rubber -- Novice Pennyplane (LPP) by Cezar Banks. Catapult Glider -- Article by Chuck Markos. Special Award: Lacey M10 -- Peck Polymers & Butch Hadland. Hall of Fame: Al Casano (deceased), Lew Mahieu and Clarence Mather.

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#65, 66 & 67 EXPIRE NEXT ISSUE

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THIS ISSUE

has three plans. The "modern" Bostonian by Dave Linstrum he calls "ugly" but really is quite attractive. Dave cannot do ugly. The NO-CAL by Dick Hawes looks good and has innovative features. The competition helicopter by Tom Vallee can stand on the record. The other tips and hints may not be new to our old readers but could be useful in that file of reprints you hand out to beginners. You do don't you ? ? ? ? ! ! !

THANKS TO

CHUCK SLUSARCZYK for doing a great job as contest director of USIC '92. Look at the contest results in the July issue heading each list is the name of the CD for each event. Chuck and those people are the ones who DID IT for the rest of us. JIM MILLER did USIC scale judging and sent the FAC and some other results to me. KEN JOHNSON supplied INAV with a wax machine for doing the paste up. It was used for the July issue and made the job go a lot better. INAV now owns a wax machine and easy to use software to manage the mailing list.

STORM ANDREW REPORT

The Fifth Annual FL Keys R.O.W. meet Aug. 1st, 1992 was a great success. Millard Wells, the C.D. was 2nd to Rick MacEntee. Current reports from FL: Wells OK, Martin OK but treeon part of house (shop OK), Linstrum OK, others ?? as phone service very poor.

MOVING ? SEND INAV NEW ADDRESS

RUBBER TEST IN ST. LOUIS

From Thermaleers Newsletter Bob Klipp, editor.

By Howard Henderson, assisted by Larry Coslick

Rubber May '91 TAN. 30 motors .040" wide 16" long made up for test. All within 1 to 2% of each other so no adjustment in results made for weight variation. All motors pre stretched to 7 X length for approx. 5 minutes and after approx. one hour tests were started.

Three motors wound to breaking (average 0.5 inch oz.) as a baseline. All subsequent tests were made to 75% of that torque (0.375 inch oz.). four motors broke during testing prior to getting to that torque. Energy was estimated by multiplying the maximum turns times the torque at the one-half unwound value. We called this energy equivalent (EEq) function.

Six motors were tested with FAI "slick" lubricant. The average EEq was recorded. Six motors were tested with "Son of a Gun" (SoaG) a product available at auto parts stores. The content is thought to be a trade secret, however it is thought to be silicone and water held in suspension. I know a knot will not hold after it is on the rubber and dried off. There was a 15.8% increase in EEq when using "SoaG" over "slick."

Dick Oborski suggested we use 10% silicone with regular lubricant. The product we used was "Super Silicone Tire Shine" by Westley Products. We did get a 16% increase EEq over "slick" but by the time we got around to that part of the testing we were getting tired. We need to spend another day trying that and any other ideas we hear about.

The real advantage of "SoaG" is that it is far less messy.

Several motors were wound a second time and we obtained the usual increase in EEq of about 15%. This was true of all lubrication systems.

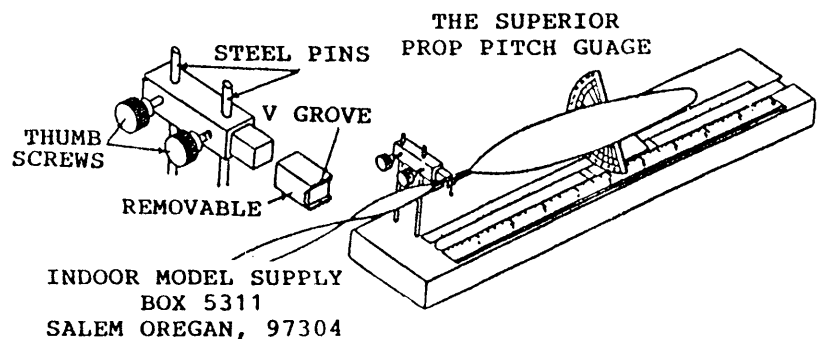
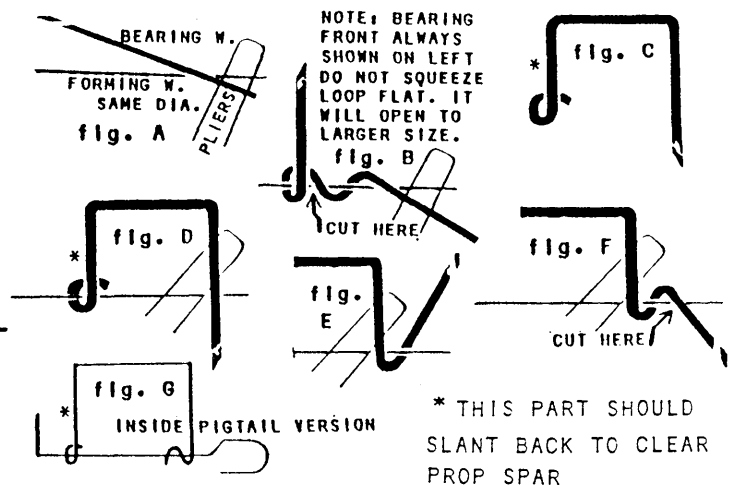
FORMING WIRE NOSE BEARINGS FOR INDOOR MODELS

John Marett letter to Burr Stanton (INMARC) via SAM 86 SPEAKS

Assuming a prop shaft dia of .020" or slightly smaller use two pieces of .020" music wire. One, about 2" long as the forming wire, the other from which the bearing is to be formed should be 12" to 15" long. Needed tools are a pair of needle nose pliers and a pair of wire cutters. First, place the forming wire under the 12" bearing wire as in fig. A and grab with the needle nose pliers held in the right hand. Start bending the bearing wire around the forming wire with the left hand. At first it will pigtail but as soon as possible wind at least one full turn perpendicular to the forming wire to make the nose loop. Make sure it is a full closed loop. Do not squeeze but make sure the loop is not more than one loop thick otherwise you will not be able to insert the prop shaft's hook. Cut bearing wire at the loop as in fig. B. Bend the body of the bearing into the shape in fig. C. Put the forming wire through the loop and under the extended end of the bearing wire and grab the two wires

with the needle nose pliers as in fig. D. Using the right hand twist the long bearing wire under and around over the top as in fig. E. Finish and cut off the pigtail as in fig. F, leave only enough to hold the prop shaft. A long pigtail may impede passage of the prop shaft hook. To cut bearing length put the pigtail inside as in fig. G. Try this after mastering the outside pigtail. All of this will take practice, the first 8 to 10 may not meet your standards. Note that .015" wire is easier to use than .020" wire.

Addendum: Don Lindley and Charles Sotich suggest the following modifications to outlined method. Step A, B, and C are done as the mirror image of that shown with the result that the pigtail is sticking out to the front. Pigtail is cut off and the resultant front surface is ground flat. Wrap is done in the direction that does not encourage the thrust washer to catch on the sharp end. Prior to forming the rear pigtail of the bearing heat that part of the bearing wire to "blue." Red hot is much too hot. This will make the "blue" part of the wire softer and easier to form but still give enough strength for the rear of the bearing. It is not necessary to temper the wire after this treatment. I found that padding the plier jaws with hardwood (very hard maple) blocks helped in getting a grip close to the twist area. If your bearing has a bit of tightness with the shaft in place lap the hole bigger with a dummy shaft and some polishing compound in oil. I used a Dremel at low speed to turn the shaft. PJB



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ANGLE FROM CENTER TABLE AND
45° DISTANCE FOR MANY CLASSES OF
MODELS, DIAMETERS, AND PITCHES.

INAV #62,63,64

AN INAV PLAN

DIHEDRAL BREAK

LE
OCT. 1992

SCROD

NO SPARE

OPTIONAL
LETTERS

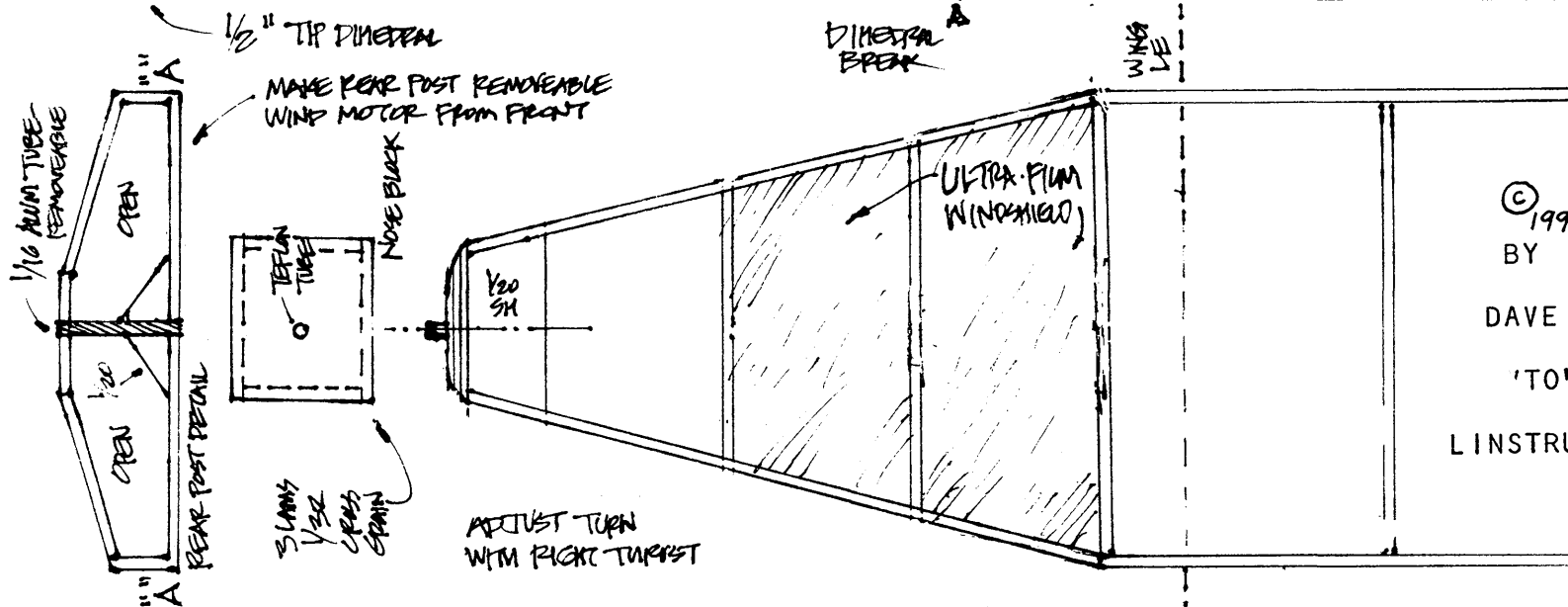
FROM IS
POPULAR
BOSTON
SEAFOOD.

TUMMY IN
TER TUMMY!

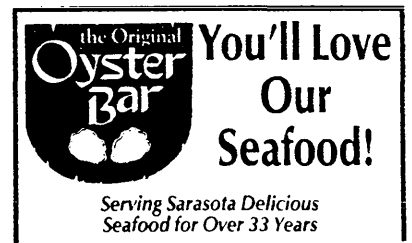
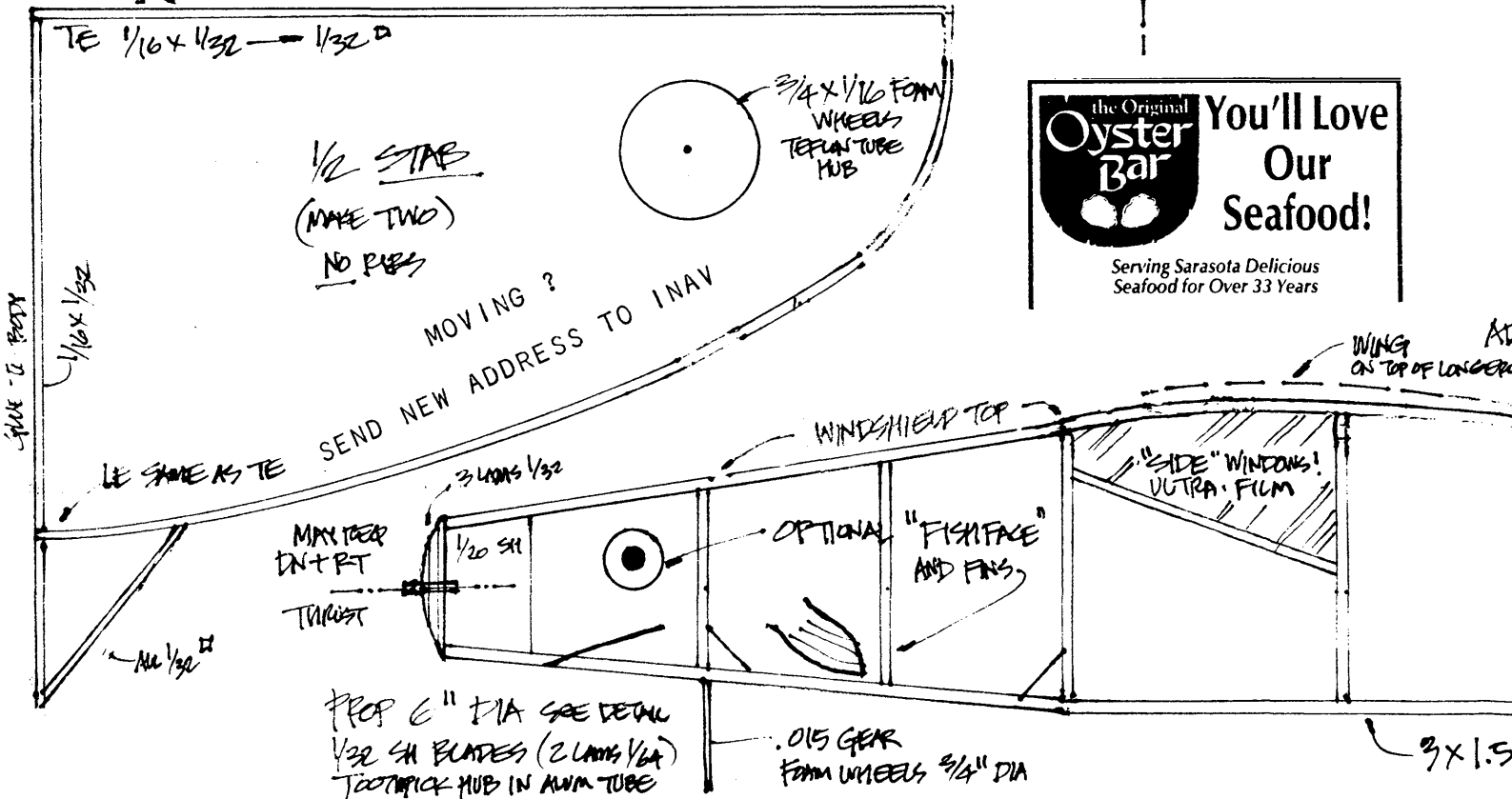
H1 - PERFORMANCE
BASED ON DAVE ARONSTEIN
DESIGN PARAMETERS 7?7

ASARE TIPLETS DO
NOT EXTEND BEYOND
16" PROJECTED SPAN!

TE



© 1999
BY
DAVE
'TO'
LINSTRU



OCT. 1992

1/16" LIGHT
DIHEDRAL BREAK

INAV #62,63,64

PAGE 3

PIES 1/32 x 1/16
SLICED

ASSURE CHORD IS
3" OR LESS

1/16 x 1/20 SPR - CUT TO
FIT BETWEEN RIBS

DOUBLE COVER ALL
PRE-SHUNK +
UNDORED JAP
TISUE

USE LIGHT WOOD TO
MEET 7g WEIGHT

NO STAR

1/2" TIP
DIHEDRAL

FLAT CTR
SHELT RESTS
ON BODY

P/B SLING
PATTERN

VERTICAL TIPJET

SLICE

TE

GLUE WING ATOP BODY

DIHEDRAL
BREAK

GLUE STAB TO BOTTOM LONGERON - NO DIHEDRAL

WING TE

BODY ALL
1/20" LIGHT

KEEP TAIL
LIGHT!

1/20" SPACE
1" B

PIG MOUNT
3/8 x 1/20
BOTTOM
SPOONED
UNDER

FIN (SHUNT RIGHT WING)

SEE SECTION
C TAIL

"A"

1/16" ALUMINUM
P/B POST

OPEN
AT REAR!

"A"

45° OR ADJ.

1" P/B BLADE (MAKE 2)

TOOTH P/B

2 LAMPS 1/64
CROSS GRAIN

NET FORM
ON 5" D OIL.

3/32" OD
ALUM.
PIPS

OPTIONAL 1/100
TIPJET
HANG BELOW BLADE

GLUE STAB HALVES TO LONGERON
ASSURE STAB IS FLAT
NO DIHEDRAL

1/20" 1/32" NET FORM

FIN

NO RIBS
COVER BOTH
SIDES

ALL 1/32"

KEEP TAIL
LIGHT!

GLUE STAB TO LONGERON
NOTE NEAR INCIDENCE

BODY OPEN AT
REAR FOR
ACCESS TO MOTOR

REAR
PIPS
ALUM.
TUBE
1/16" OD

FIN
1/16"

8/8/91

x 2.5 BOX - CHECK STRUCTURE!

© 1991
DAVE
LINSKY

Boston SCROD 7g Bostonian VTO

WINDING STOOGES TIPS - Dick Hawes

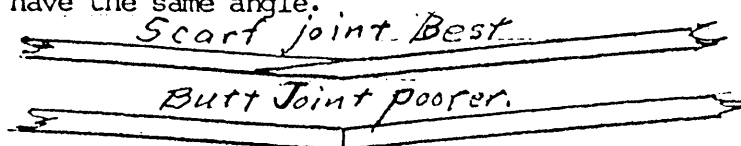
NO-CAL AERONCA CHAMP

There's a story behind this airplane. First off, Koehlar is as tired of No-Cal J-3 Cubs as I am of Fikes, so I promised I'd build something else. I already had a J-3. What could be more fitting than to fill up my 1947 airport scene with a Champ? After all, They were contemporaries. Plus, I used to fly Champs. This particular one, NC2111E, is the one I flew out to Columbus with the girl who has spent the last 43 years with me, so that I might "Meet the family". They were impressed.

The unique feature of this model is the removable motor stick. There are two reasons for it-maybe three. First, FAC Rules for No-Cal (I think they originated the event), call for all the struts to be in place. It is a pain to wind the rubber stretched through the struts. Second, the motor stick should not be glued to the rear of the plane, because that transmits all the twisting and bending moments of the motor stick to the fuselage and tail assembly, so half of the stick has to be loose anyway. Third, and I haven't done this yet, it is possible to use the same motor stick on more than one plane. Yes, that IS getting thrifty, isn't it? (Cheap?)

A thin wire on the rear of the motor stick engages a hole in a small aluminum tab on the rear of the fuselage to maintain motor stick alignment without twisting the fuselage. The front of the motor stick has a thin wire (.015") bound to it which inserts in an aluminum, or plastic tube in the sheet balsa front end of the fuse. A couple of 1/16" standoffs keep the stick far enough from the fuse to permit room for the rubber knots. A bent pin through another tube in the fuselage serves as a lock to hold the stick in place. Everything else is conventional No-Cal.

However, because I've got a lot of room left in this issue, and because we're sort of addressing some newcomers to the hobby, let's describe some of the construction in a little detail. The wing can be made a couple of ways. One, and probably the best, is to make a little sketch of the front view of the wing, showing the dihedral angle, (1/2" each tip), and pin a couple of 1/16" pieces to the plan at that angle, making a scarf joint as shown below. A scarf joint is simply a long diagonal joint which provides more surface for the glue and makes a MUCH stronger joint than a butt joint. Put one stick on top of the other, in the proper position, then slice through both with a razor blade to be sure that both pieces have the same angle.



Do the same for the trailing edge and the spar. When the joints are dry, pin the L.E. and T.E. to the right half of the wing plan, with the left half up in the air, off the plan. Glue the ribs in place on the right half. When dry, unpin the right half of the wing and pin down the left half and glue in the ribs. Note that there are two ribs in the center, spaced 1/16" apart. these straddle the fuselage, so use a scrap 1/16" piece to gauge the space and BE SURE to have them at the proper angle so the wing will be level when you glue it to the fuselage. When dry, take it up and glue the spar in place, under the ribs. Remember to keep it centered properly, and notice it is longer than the edges, so as to meet the tips. *The other way is to use butt joints like on a Peck R.O.G.*

The tips are made by soaking strips of 1/32"x1/16" balsa in hot water for about 20 minutes, then securing them to a cardboard, foam or balsa form shaped to the inside dimension of the tip. Wax the form so the tip doesn't stick, using a candle or crayon. If using a crayon, make sure it is the same color as the airplane because it comes off on the wood. Use two strips, longer than you need, with white glue, like Elmer's, between them. Tape one end of the stack to the form and PULL the two strips around tightly to the form and tape it to the other end. It helps to leave some extra space at the end of the form to have something to tape to. Let them dry in the air overnight or give them about a minute in the microwave or a half an hour at lowest heat in the oven. When dry, cut another scarf joint to fit the leading and trailing edges and glue in place with the tip raised to meet the spar and glue there, too. This is best done with the wing panel pinned down again.

The fuselage and tail is made just like building a Peck ROG or similar, except the shapes are different. Best to build the parts, then cover them with tissue, but it is still best to do the markings on the tissue before you apply it to the framework. You just have to be a little careful to get it in the right place. I used yellow tissue from Airmen's Supply in Norfolk, colored with a red wide tip felt marking pen, except for the fussy little stuff where I used a fine tip.

The stick is also just like on any simple stick model, and so is the landing gear. For the thrust bearing, I use a piece of 1/16" O.D. brass tubing soldered to a thin brass strip or music wire so I can adjust the line of thrust. This is important for getting realistic smooth flights. There are other ways of doing it. You could use a North Pacific or Sig plastic bearing or one of Tom Winter's pop can bearings or a Peck nylon bearing like

Linstrum uses in the ones he has in Model Aviation, or flatten a piece of 1/16" aluminum tube and drill two holes in it like so:



To assemble, put a little glue on both sides of the fuselage where the wing goes, slide the wing over the fuselage so the leading and trailing edges and spar fit into the notches provided, with one center rib on each side of the fuselage. Lay the assembly on the bench upside down GENTLY, and line everything up square and use a couple of blocks of wood or dope cans or such to hold the fuse vertical, so when the glue dries, the wing will have equal dihedral both sides. Then glue the stabilizer in its slot and prop it level while blocking the fuselage vertical. Glue the struts in place. Now add the landing gear and bond paper fairing. I used yellow felt tip to color it. Matched the tissue real close.

I fly mine on a 15" loop of 1/16" sq. FAI grey rubber. I use some down and left thrust bent into the brass bearing mount. It flies in left circles at a very realistic speed and attitude. Best time so far is about a minute and fortyfive seconds under a forty foot ceiling. It wont beat a No-Cal Fike, but it'll sure look a lot better while it's up there, and that's what it's all about!

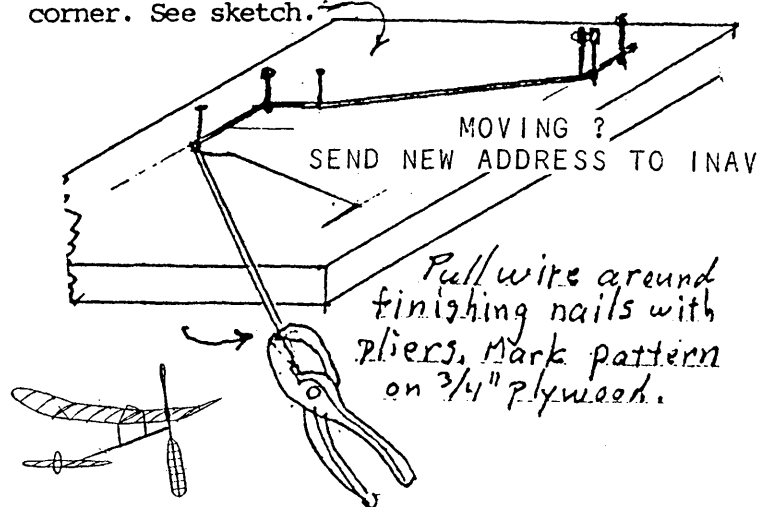
MORE TIPS

Ceiling tiles make great building boards. They are cheap, especially if you can find some where a building is being remodeled or torn down or they had a roof leak. they aren't for cutting on, just for building on, because they take pins so well.

Cutting tissue for numbers, trim and such is always a fussy job, but it does wonders for the looks of a plane. Make it easier by putting the tissue between two sheets of wax paper and ironing it ever so lightly with a warm, not hot, iron. This holds everything in place nicely and prevents the tissue from slipping around under the razor blade and stiffens things up so that it cuts crisply. I copied this from somebody, too. You can even scribe the pattern on the top piece of wax paper so you're not cutting through so many thicknesses.

Do you have as much trouble as I do bending wire landing gears and getting all the bends in the same plane? Except for the simplest ROG stick models, I've given up on pliers and vise for this. I now draw the pattern on a piece of plywood, drive a finishing nail at each bend, and capture the wire with two nails at the starting point and "pull" the wire around the nails with pliers, keeping it flat to the board. Sometimes it helps to drive another

nail to hold the bend after you go around a corner. See sketch.



Another plug for a product. The plastic cutting boards are great! No grain to cause your razor blade or Exacto knife to go off course. No left over cuts from previous jobs to cause the same thing. I'm not sure what kind of plastic they are but I'm guessing it's polyethylene. The cuts and slices you make in it do heal up. It is firm but soft and does not dull blades as fast as other cutting surfaces. It is smooth and has a grid printed on it so you can eyeball some jobs. NOT for building on, just for cutting.

When you're slicing ribs, tips, formers, keels, or whatever, you always cut in the direction such that the grain leads the blade AWAY from the finished piece don't you? No? I don't either. But I always wish I had.

When you're sanding something, do you just hold it down on your workboard? It took me fifty years to figure out that you glue a sheet of 180 grit sandpaper to a board big enough to take a whole sheet and put the piece you're sanding on top of it. Then, it stays put! NO more slipping and crumpling up just as you get the piece of 1/32nd sheet sanded thin.

You DO use a sanding block all the time don't you? No, I don't either, but I'm always sorry when I don't. ALWAYS use a block. It doesn't have to be fancy. Did you know those little wooden things they stick in steaks that say rare or well done are 1/16" thick? Make neat notchers with 180 grit on the edge. Give it a swipe with a red marker pen so you can find it on the bench.

THE WINDING STOOGE is the voice of the Nebraska Free Flyers.

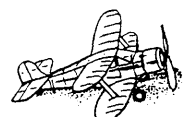
Subscription \$10.00 US for the USA

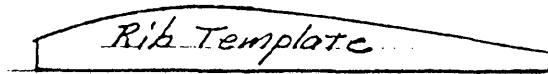
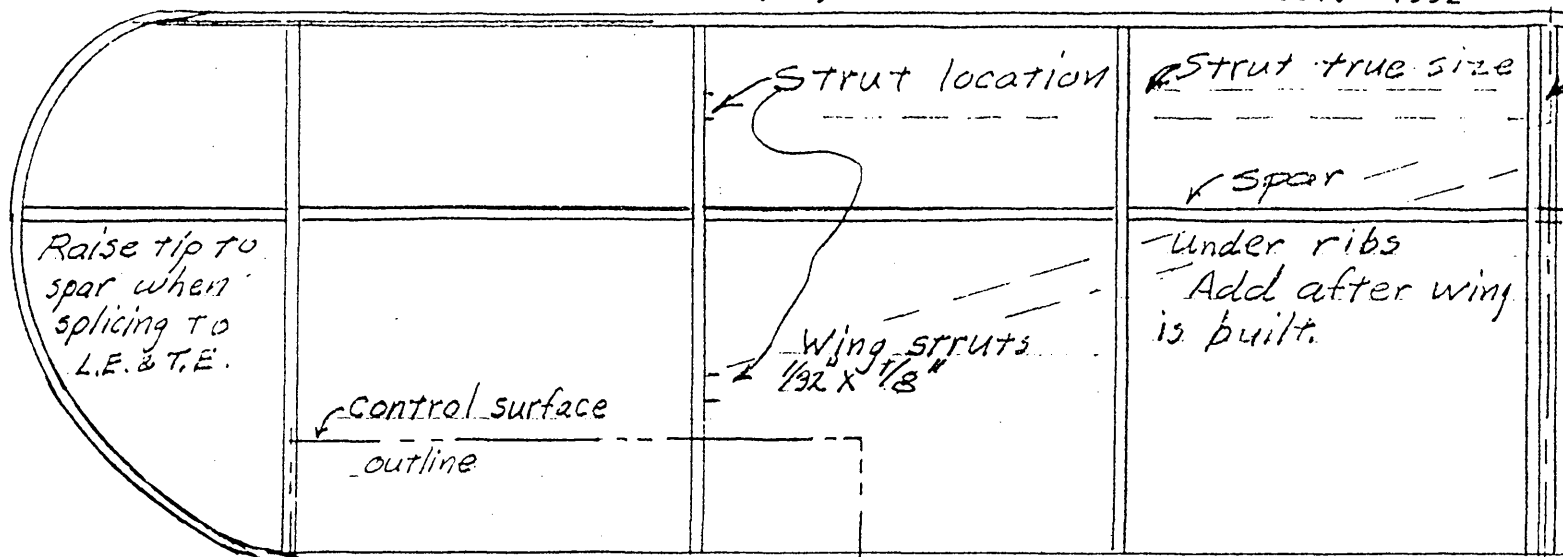
Dick Hawes

Treasurer

9220 N 52 AVE

OMAHA NE 68152





Basic structure is 1/16" square

Ribs are sliced from 1/16" sheet.
Tips are laminated from 2 strips of 1/32 x 1/16
formed around cardboard or foam form,
waxed with candle or crayon.

Color is creamy yellow with internal orange trim.
Original covered on right side, motor stick on left.

1/16" sheet

Notch for L.E.

Notch for spar

Notch for T.E.

1/16" Sheet

Plastic Windshield

Thin plastic windows

1/16 Sheet

Alum. Tubes
in sheet for
removable
motor stick

color line

3/32" x 3/16" Motor Stick

1/16" O.D. Brass Tube Brg.

Solder to .025" x 3/32"
brass strip. Glue & wrap.

Original used 6"

North Pacific Prop

FROM:

THE WINDING STOGE - TOM WINTER, EDITOR

.020" M.W. Ldg. Gear

Paper Fairing

Meat Tray foam or 1/16 Balsa

Wheels with 1/8" dowel hubs.

See "Modeling Tips" this issue.

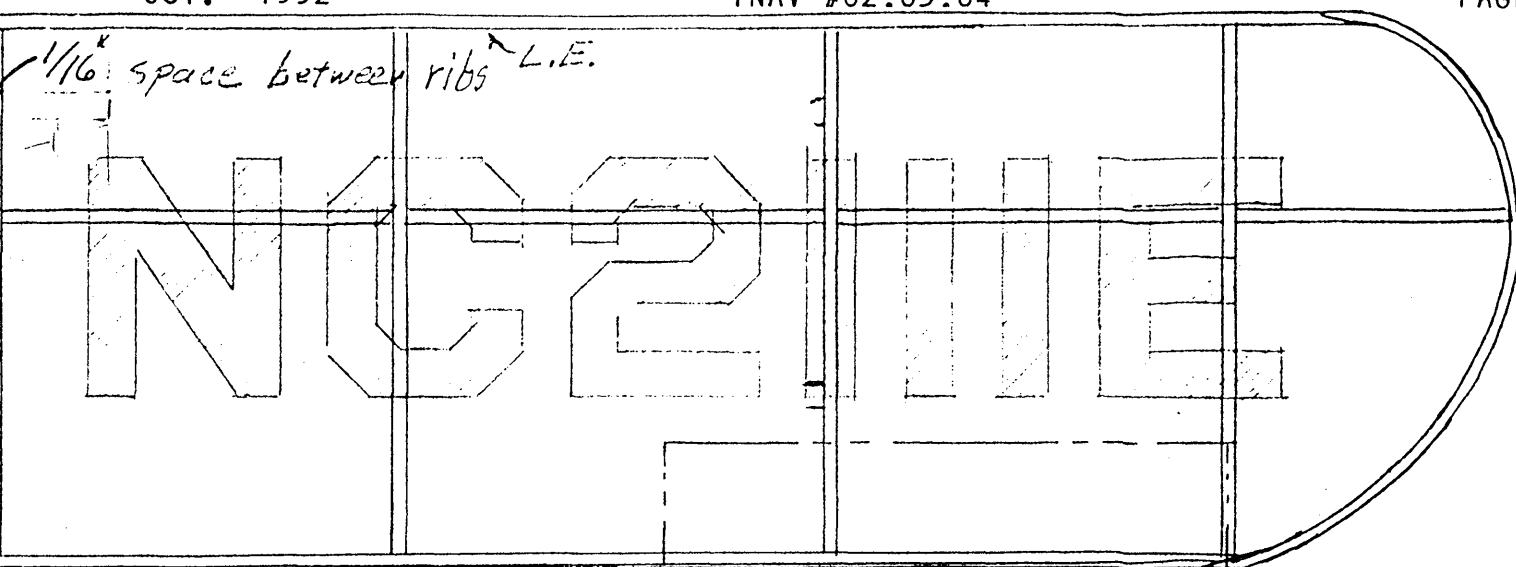
Use Aluminum duct tape for hub caps.

If you don't want
motor stick (but you
at the front only
fuselage on 1/16" sta

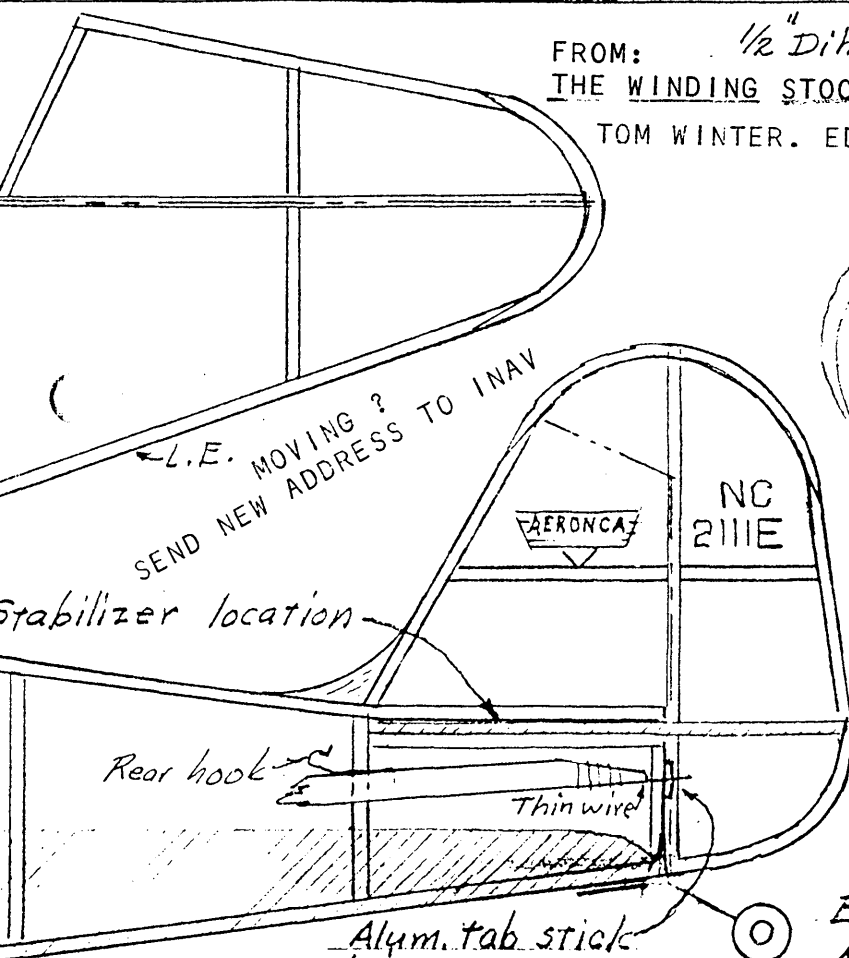
Indoor,
one op

Do N

not do

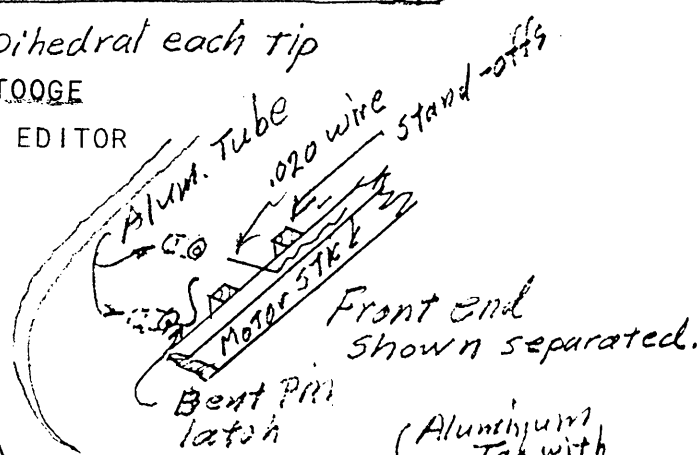


FROM: $\frac{1}{2}$ " Dihedral each tip
 THE WINDING STOOGIE
 TOM WINTER. EDITOR

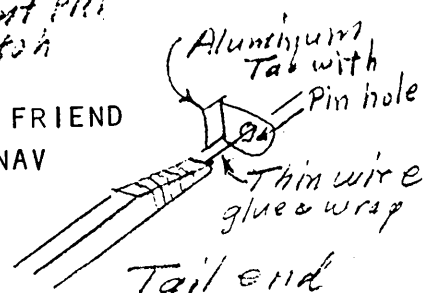


Want a removable
 (should), just glue it
 . Stick stands off from
 end-offs.

use $\frac{1}{16}$ " sq. rubber
 @ 1" long.
 NOT water shrink
 the tissue!



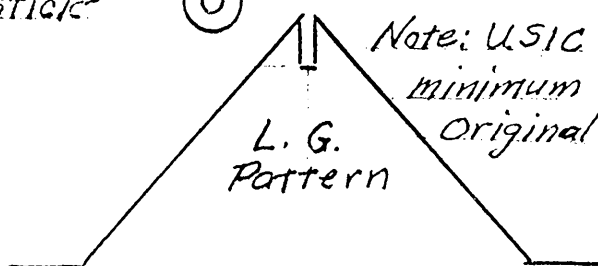
SIGN-UP A FRIEND
 IMPROVE INAV



This removable motor stick
 is a lot easier to build than
 to draw!!

Best time to date: 1:43.4

Note: USIC Rules require
 minimum weight 6.2 grams.
 Original weighs 6.8 grams.



L.G.
 Pattern

Aeronca 7AC Champion
 No-Cal Scale

Designed by: R. Danford Hawes, P.E.
 Drawn by: R.D. Hawes; Checked by: R.D.H. 4-17-92

THE CORKSCREW VI HELICOPTER

By Tom Vallee

This design is a simplified version of Bill Bigge's helicopter from the 1959-1961 Zaic Year Book. It is a simple, straight forward, easy to build design. It's a lot of fun to fly and has proven quite reliable.

Surprisingly, the Corkscrew design goes back quite a few years. Earlier Corkscrews featured 12 inch rotors and shorter motor sticks and weighed .010 to .014 ounce. These early corkscrews held the AMA Cat I and Cat II records back in the late 1960's. So the Corkscrew VI does have good lineage.

The Corkscrew VI has been quite successful in competition, winning first place at the last three USIC contests, setting AMA national records for Helicopter in 1990 and 1991.

The national records were a humbling experience. In 1990, Corkscrew VI broke big Jim Richmond's Cat IV helicopter record by about 6 seconds at the USIC. Guys I never met before made a point of looking me up and extending congratulations. I felt like a celebrity. In 1991, I smashed my own record by 34 seconds. Nobody even noticed. Fame it appears, is fleeting. There must be a moral in there somewhere.

Building a Corkscrew is simple. Motor stick construction uses exactly the same techniques one would use for making a motor stick for F1d or Intermediate Stick. The airfoil is a simple arc with about .100 inch camber at the middle of the longest (tip) rib. I use a

simple jig for building the rotors. However, strictly speaking, a complete jig is not absolutely necessary. It is possible to draw an "elongated X" on your building board and using simple balsa triangles to align tips and center, build the rotors right on the board.

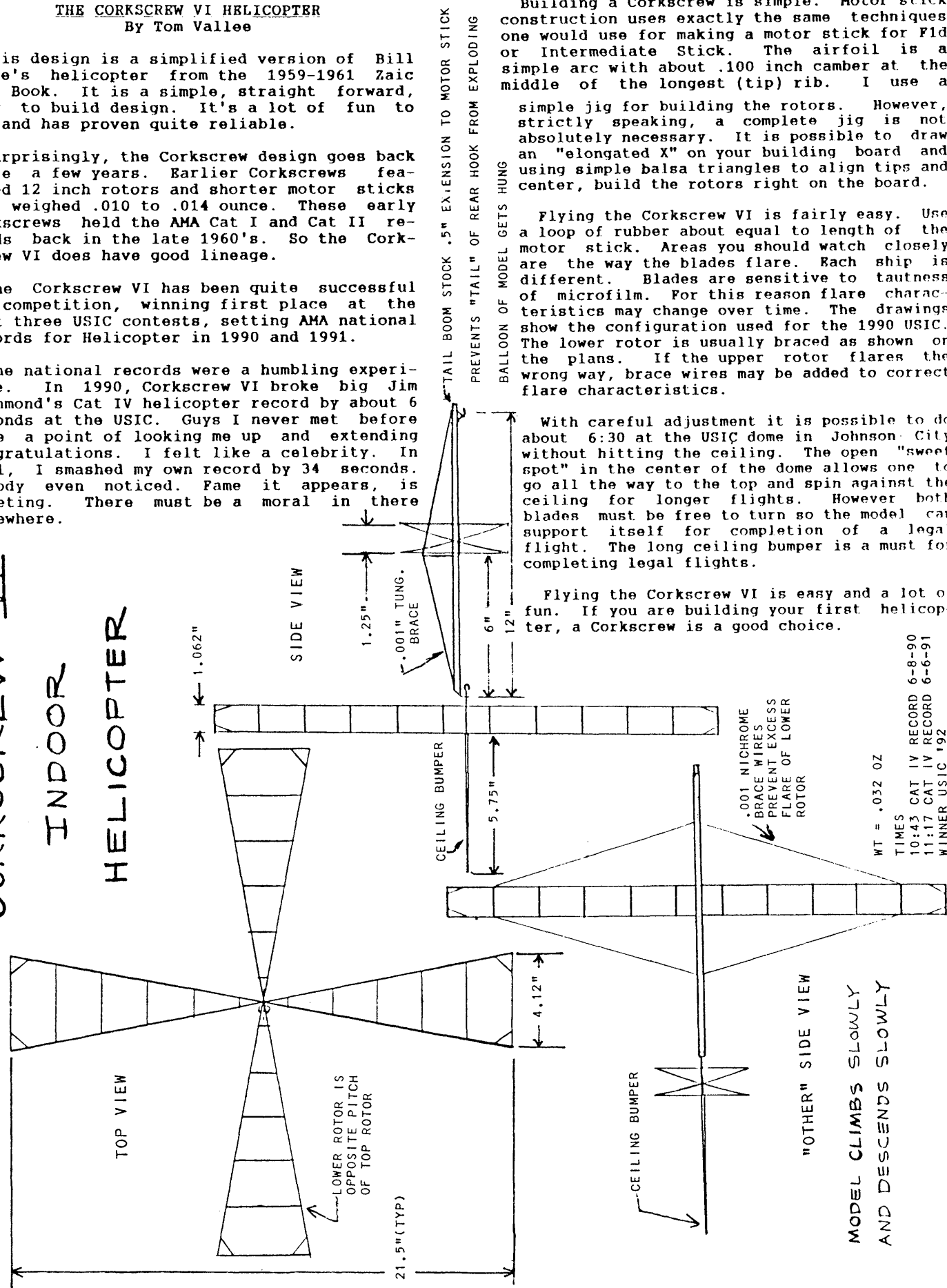
Flying the Corkscrew VI is fairly easy. Use a loop of rubber about equal to length of the motor stick. Areas you should watch closely are the way the blades flare. Each ship is different. Blades are sensitive to tautness of microfilm. For this reason flare characteristics may change over time. The drawings show the configuration used for the 1990 USIC. The lower rotor is usually braced as shown on the plans. If the upper rotor flares the wrong way, brace wires may be added to correct flare characteristics.

With careful adjustment it is possible to do about 6:30 at the USIC dome in Johnson City without hitting the ceiling. The open "sweet spot" in the center of the dome allows one to go all the way to the top and spin against the ceiling for longer flights. However both blades must be free to turn so the model can support itself for completion of a legal flight. The long ceiling bumper is a must for completing legal flights.

Flying the Corkscrew VI is easy and a lot of fun. If you are building your first helicopter, a Corkscrew is a good choice.

CORKSCREW VI INDOOR

HELICOPTER



WINDER EXTENDER TORQUE METER

From: National Free Flight Society Digest
By Don J Lindley

The use of torque meters in indoor flying of endurance models is an accepted and well understood phenomenon. Meters have been made by several manufacturers, and articles describing home-brew meters have been published. There is even a meter, on the market, which attaches to a winder made by the same manufacturer, so that torque measurements may be made while winding models where the rubber band cannot be removed from the airframe and wound on a classic torque meter. However, we have tried a slightly different approach and made a torque meter from easily acquired, hobby shop materials, to be used as the winder extender with a winding tube.

The length of the torsion bar and the diameter of the bar are selected from the attached chart to allow winding a loop of rubber up to .200 in. wide. This still allows adequate sensitivity for winding .060 Peanut motors. Obviously, the meter may be sized to work with the motor sizes which are of interest in many different areas of our sport. The calibrated dial may be enlarged or reduced in size depending on your need for lighter weight or poor eyesight.

The meter is made as it is to provide reasonable ruggedness with low inertia. The small piece of brass tubing at the tail end is used so that the tail may be finished and tied down well without becoming a major project. The sequence is as follows:

1. The winder hook and pointer are bent in a length of .025 wire.
2. The disc is cut out and the face is cemented to it.
3. The aluminum tubing is cut and the disc and thrust bearing are cemented to it.
4. The brass tubing is cut and a small slot is filed in the end.
5. The brass tubing is cleaned and inserted in the cleaned aluminum tubing.
6. The wire is accurately measured and marked to form the torsion bar section and inserted into the tubing.
7. The tail-end eye is formed and the brass tube is withdrawn and soldered.
8. The brass tube is positioned to provide about .020 in. clearance between the thrust bearing and the pointer, then turned until the pointer is at zero. It is then cemented in place.
9. Solder only with an iron. A torch will overheat the wire.
10. If the wire is of normal music wire quality, it will always return to zero unless it has been forced to go more than 360 degrees. If this does happen, simply turn it backward until it yields and returns to zero.

The need for an extension hook on the tail end was first thought to be a disadvantage. After using the meter for a while, it was found that the extender offered a needed universal joint which makes the release of the winder/meter unit much easier. Simply hold the extender hook and let the winder/meter combination rotate to develop the loop needed to transfer the motor from the winder to the prop hook. Also, it is a fairly easy matter to change extender hooks to get the best possible fit to the rubber being used.

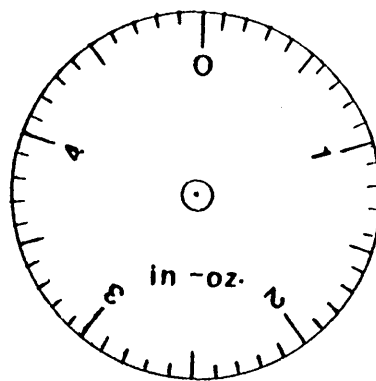
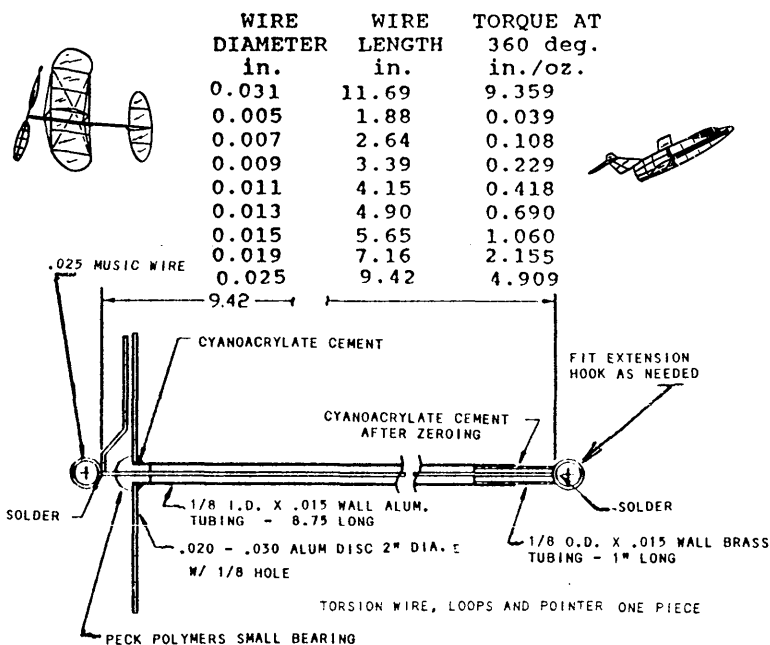
Special recognition should be given to Charlie Sotich, who developed the original tables from which the parameters given were drawn. The originals contain data on motors up to 40 strands of 6 mm.

PARAMETERS OF ONE LOOP OF
VARIOUS WIDTHS OF RUBBER

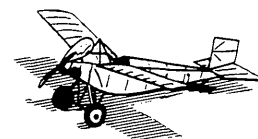
RUBBER WIDTH, in.	LOOP WEIGHT gm./in., oz./in. approx. approx.	MAX TURNS per in., approx.	MAX TORQUE in.-oz., approx.
0.020	0.026	0.00092	210.0
0.030	0.039	0.00138	171.5
0.040	0.052	0.00184	148.5
0.050	0.065	0.00230	132.8
0.060	0.078	0.00276	121.2
0.070	0.091	0.00322	112.2
0.080	0.104	0.00368	105.0
0.090	0.117	0.00414	99.0
0.100	0.130	0.00460	93.9
0.110	0.143	0.00506	89.5
0.120	0.157	0.00552	85.7
0.130	0.170	0.00598	82.4
0.140	0.183	0.00644	79.4
0.150	0.196	0.00690	76.7
0.160	0.209	0.00736	74.2
0.170	0.222	0.00782	72.0
0.180	0.235	0.00828	70.0
0.190	0.248	0.00874	68.1
0.200	0.261	0.00920	66.4

TORQUE METER WIRE PARAMETERS
assumes 100,000 psi yield in torsion

Data from C. Sotich, 1972



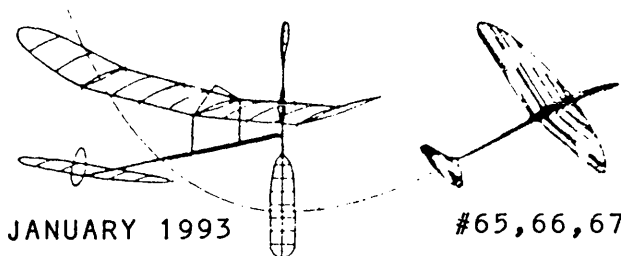
MOVING ?
SEND INAV YOUR
NEW ADDRESS



Ed. note: You may wish to calibrate your meter after assembly. All that is needed are masses of known value. Two points are all that are needed to lay out the full scale but by using three or more you have a check on your work. You should find that Young was right.

INDOOR

NEWS and VIEWS



JANUARY 1993

#65,66,67

EDITOR: PLENNY J BATES, 2505 WHITE EAGLE TRL SE, CEDAR RAPIDS IA 52403. PHONE 319-362-2969
FAX 319-364-7819

GARBER SELECTED NEW INAV EDITOR

Well known Indoor modeler and editor of NFFS SYMPO Les Garber will take over after the July Issue. Les has the technical background and the editing skills that will improve INAV. There is also a backup team in the wings that can take over from him if he burns out as fast as your present editor. The word is out, being editor of INAV is a good deal

USIC SAVED BY TOM IACOBELLIS

N.Y. MODELER NATIONAL HERO

After a long search to find the best person for the job Tony Itallano has announced that Tom Iacobellis of Hawthorne NY is to be the manager of the United States Indoor Championships to be held in Johnson City TN June 3-4-5-6, 1993. Addition of the Nationals (see Nationals story) to the USIC extended the contest from three to four days. As those who have attended know Johnson City has a plethora of reasonably priced housing. Banquet is June 4

IACOBELLIS NEEDS PART TIME HELP

In an exclusive telephone interview for INAV Tom was quick to point out that the contest will be the usual success only if a large number modelers volunteer to serve part time during the contest. Being involved at this level will not prevent anyone from flying events. Work times will be fitted into the flyers contest schedule. Most will have only one specific duty during the contest and that rather than taking away from the contest experience will enhance it. If you really want to have fun at the USIC/NATS contact Tom. Those not competing are also welcome. Help a little and have a lot more fun.

Contact: Tom Iacobellis
198 Manhattan AVE
Hawthorne NY 10532

Phone: 914-747-9038

Go on, have more fun, call Tom, JUST DO IT !

USIC & NATIONALS JOHNSON CITY TENN.
JUNE 3-4-5-6, 1993 -USOC/NATS MUNCIE
SEPT 1-2-3-4-5, 1993 -TEXAS NATS OFF

Problems of FAA clearance of air space has resulted in the cancellation of the 1993 NATS that were to be held in Lubbock TX. The indoor and outdoor free flight events have been moved and combined with NFFS events. The fate of R/C events was not known at press time. You would not read it here anyway as this is an INDOOR newsletter.

NEW SUBSCRIPTION RATES

INAV is about 50% larger. By using bulk mail domestic costs are up very little. For others the postage forced a larger increase.

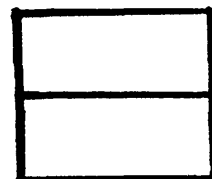
Now:

\$9.00 U.S.A., Canada, Mexico
\$12.00 Air Mail all others

Cash, check (U.S. bank) or Postal Money Order. Must be U.S. dollars. May pay \$10.00 cash for partial or extra credit depending on address. Send to:

Pleenny J Bates
2505 White Eagle TRL SE
Cedar Rapids IA 52403

SUBSCRIPTION STATUS



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EXPIRES NEXT ISSUE

CHECK ADDRESS LABEL. IF # 65, 66, 67 THIS IS YOUR LAST ISSUE. Do not depend on "RED X."

JOIN

NATIONAL FREE FLIGHT SOCIETY your ticket to more and better free flight. A membership supports your hobby and you get a real class publication the NFFS DIGEST. This is not to mention a reduced rate on other NFFS publications. Contact the new membership chairman:

Edward M Sullivan
19 Frederick DR
Newport News VA 23601

Rates: \$15.00 one year or \$ 27.00 two years

THE JOY OF FLYING FREE

This video that has been several years in the making is now done. These are not home movies. This has been a NFFS project and has been professionally produced. About 35% of the tape is indoor. Be the first on your block to show the wonders of FF to your friends. Order from:

Tony Itallano
1655 Revere DR
Brookfield WI 53005

Special price if you mention INAV- \$25.00 plus \$3.00 postage.

MOVING ? SEND INAV NEW ADDRESS

HOW TO "HANDLE" ULTRAFILM COVERING JOBS

LARRY D. COSLICK

First published In The Turbulator of St. Louis MO.

I attach a handle to wing and stab outlines for all my Ultrafilm covering jobs. It keeps the trailing edge straight and gives me complete control when I place the outlines on the film. It works best on large wings and very light stabs. All outlines are covered flat and any dihedral is added later.

MAKING THE HANDLE

Make the handle from a piece of 1/32 medium sheet balsa 1 inch wide and as long as needed. Make the fingers from 1/32 sheet, 1/8 X 1.25 inches long, and attach to one edge of the handle 3 inches apart. Using a straight edge, trim the fingers precisely 1 inch long and taper the finger tips to 1/16 inch. The handle is now ready to use.

Using any flat surface and wax paper, invert the outline, and slide the handle, centered on the span, up to the trailing edge (TE). Using a fine marking pen mark the position of each finger on the TE. Now place a small dot of thinned carpenters' glue at each finger location and also on the end of each finger. Let it set about one minute. Using weights hold the handle in place then connect the fingers to the TE glue points. Again, a few weights on the back side of the TE will hold it in place. Prop up the leading edge (LE) 1.5 inches for an EZ-B, more for larger wings. Try to place the handle on the outline one hour before covering because it is easier to remove the handle after the outline has been covered.

PREPARING THE FILM

I prefer using wrinkled film. Take a piece of film 10 inches longer than the outline and wad it up in your hand several times. Then spread it out on a piece of Formica. You can either tape the film down taut or spread it out until all the wrinkles are gone. Then pick it up with a covering frame. I use an adjustable frame with 3 turnbuckles to slack the film and 2 diagonal turnbuckles to remove the wrinkles.

SPRAYING WITH THE 3 M 77 TYPE ADHESIVE

Protect the top side of the handle and handle fingers with Scotch drafting tape until the outline has been sprayed. The drafting tape is easier to remove than regular masking tape.

With a light behind you and paper on the floor, make a test by spraying the adhesive 5 feet above the floor and watching the mist as it falls to the floor. Now take the outline with the handle attached and spray as before and wave the outline through the falling mist, ONCE. To determine if the correct amount of adhesive is on the outline, take a 1 inch patch of film and wad it up into a ball and very lightly touch the outline with the film every 5 inches. The film should just barely stick. I have found that you can use your finger instead of the film patch on the LE but the stiffness of the TE (because it is attached to the handle) makes it difficult to determine if there is enough spray unless you use the film patch. If the patch will not let go you have too much adhesive, release with some acetone on a small brush.

PLACING THE SPRAYED OUTLINE ON THE FRAME

With the tape removed and having predetermined where the outline best lays on the covering frame, lay the handle fingers on one edge of the covering frame and lower the TE onto the film. The LE should be in the air at this point, free of the film. Lightly rub your finger along the TE. Then RAISE THE HANDLE and the LE will contact the film. Trace the entire outline and if there are any unwanted wrinkles, push down on the film beyond the outline and loosen the film with a fine artist's brush and acetone while still depressing the film. Finally, press the outline back on the film.

FINAL OPERATION

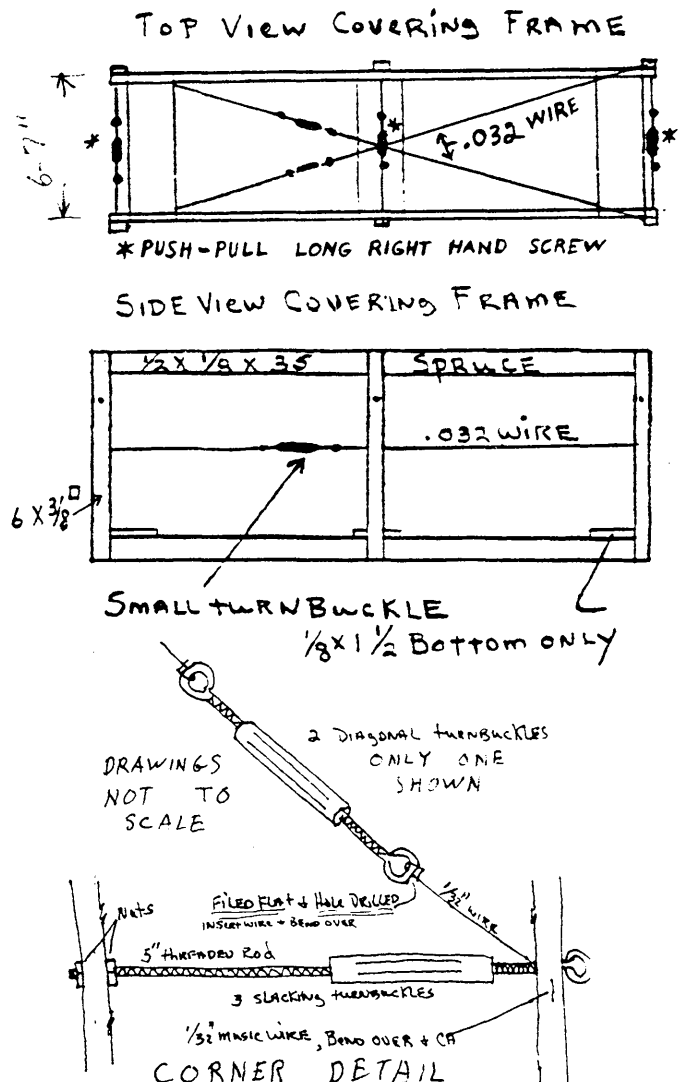
Remove the handle by using an artist's brush and wetting each finger where it attaches to the outline. Wait 5 minutes for the glue to soften.

Several applications of water may be necessary. Gently raise and lower the handle until it separates from the outline. Wait an additional 5 minutes for everything to dry. My 25 watt iron will cool and possibly tear the film if the wood is too wet around the glue points. After things have dried, use the iron and make your burn in 4 to 5 inch sections and then sweep the iron away from the outline. Leave a 1/8 inch strip of film at each corner to hold the outline in place until it is free from the film, then hold your hand under the outline and burn the 4 corner strips free.

REMOVING SLACK IN THE FILM

After placing the dihedral the slack at the tip dihedral breaks can be removed by making a solution of 1/2 teaspoon (2.5 cc) of water and 3 drops of carpenters' glue, thinned 50/50. Using an artist's brush, LOAD the brush with the solution and starting at the LE and on the tip side of the rib, run the brush from the LE to the TE and it will pull the loose film up against the rib. A brush that is about 1/8 inch diameter at the bristles works best.

Addendum: The three cross frame turnbuckles each have one threaded section removed and replaced with a 5" threaded rod. The end away from the turnbuckle passes through the frame upright and is held with a nut on either side. These slacking turnbuckles are only intended to pull in the sides but if extended will tighten the film. The diagonal turnbuckles are also pulling but must be loosened when new film is placed on the covering frame. It helps when burning off the film if the covering frame is a dark color instead of the natural wood color.



CONTINUED NEXT PAGE

THE F1D CHALLENGE

Lt. Col. Bob Randolph

Introduction

Plenny Bates convinced me that there is an urgent need for more F1D flyers (new blood) if this sport is to endure. He suggested that I write a series of articles to stimulate more interest in this type of model. Because of all the success and pleasure I have received from indoor over the years, I've accepted the assignment and this is the first of the series.

It is a little ironic for me to be pushing F1D when I've had sort of a love/hate relationship for the last 20 years. For example I recall Rick Dolg asking if I still hated F1D after I finally made the US team and won the Bronze in 1984. Actually, I never really hated F1D. It is just that I dislike the dumb 65 cm and 1 gram rules that together result in low aspect ratio wings and somewhat ugly models. On the other hand, F1D's are outstanding flyers and have other redeeming advantages. Most important, it is the only class of indoor model recognized internationally for World Championship Competition. F1D provides the opportunity for us to match our skill and ability with the world's best modelers.

Building and flying the many other types of indoor is fun, however it takes F1D to reach the ultimate goal of Indoor World Champion. I can assure you that nothing equals the pride and satisfaction of standing on the winners platform when the US flag is raised and our National Anthem played. As a retired USAF Lt. Col. with 30 years of service, I've had more than my share of pomp and ceremony but I frankly admit that my eyes moistened up at each of the four World Champs I've participated in.

Building an F1D model isn't easy but it is not as difficult as many modelers seem to think. My daughter, Linda, built some pretty good F1D's when she was a junior. I recall I used to tease her that I could teach a baboon how to build indoor. The point is your first F1D won't be the greatest but with determination and effort, each F1D will be better. It took me 15 years to win my first US Team slot. For those modelers that aren't interested in competition, your first F1D will fly better than anything you have ever built. Please humor this old timer (69 years young) and give F1D a try. My next article will suggest how to get started.

WORLD'S BEST GLUE GUN

Is of the same general design as the Bigge/Micro-X glue gun of several years ago with improvements in the seal where the "cleaning / micro drop delivery wire" enters the neck of the long narrow gauge delivery nozzle. It now has a curved pickup tube that is close to the side of the bottle. \$10.00 plus \$1.00 post will put one of these wonderful tools in your hands. Send your \$11.00 to:

Harry G Geyer
81 W Bruceton RD
Pittsburgh PA 15236

Bill Warner has used one and thinks it is great. He may feature it in one of his Model Aviation columns. If it is his next one you will need to be quick to avoid the rush as

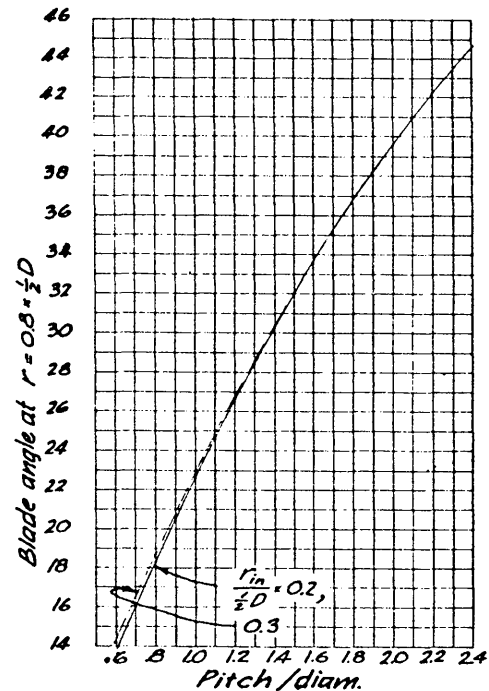


Figure 4: Blade Angle at 80% Radius

APPENDIX

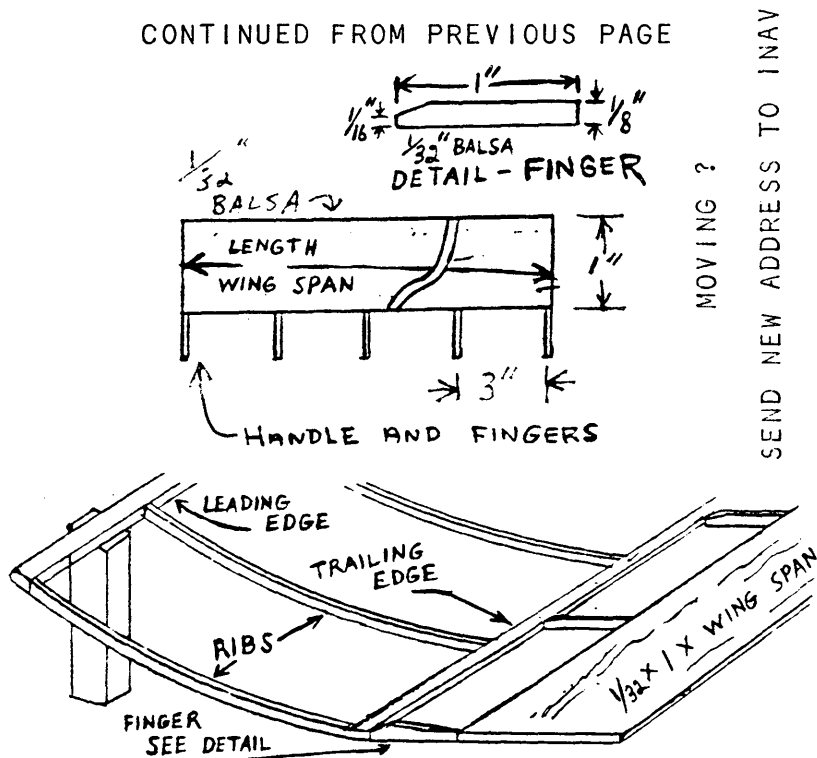
NOMENCLATURE

P	prop pitch
D	prop diameter
α	prop blade angle
c	prop blade chord
h	camber height
L	blade length
R	"cam" radius
r	dist. from propshaft to any point on blade
s	twist rate of blade
ϕ	helix angle; the angle at which the prop blank is wrapped around the can.
H	blade arch height, see figure in appendix
P/D	pitch-diameter ratio
h/c	camber ratio
c/D	chord-diameter ratio
2R/D	ratio of can diameter to prop diameter
F	(h/c)/(c/D)
S	$\frac{1}{2}sD$ $\frac{1}{2}sD$ = twist parameter; total twist for a blade that extends to the propshaft.
H/D	blade arch parameter; a measure of the grotesqueness of the prop.

some of "the others" read MA. When 13 years old I would have sold my dog and cat for a Beacon Electronics Good Brothers radio. With one of them (\$69.95) and \$1,000.00 worth of batteries you could have your gas model return almost to your feet. At least E. Paul Johnson a second place winner at the NATS did it that way. Well my dog and cat together would not bring a dollar and \$69.95 was like reaching for the moon but now I have the finest product of Harry G Geyers hand and mind. That is correct Harry was Beacon Electronics.

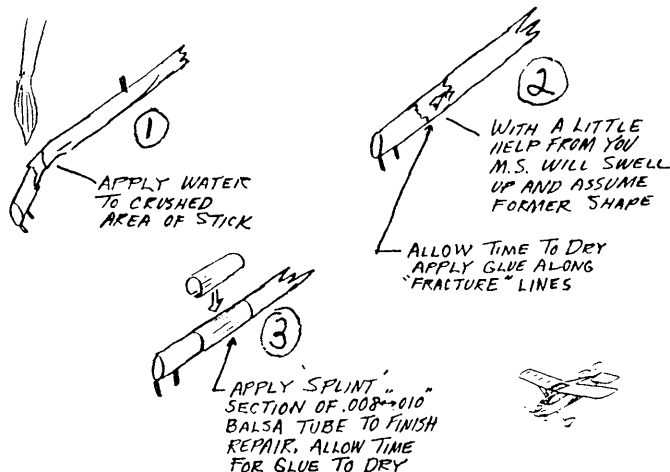
1993 INTERNATIONAL MINI-STICK POSTAL CONTEST
Sponsor: Mike Colling of England. Information
SASE to: Tom Vallee, 444 Henryton So.,
Laurel MD 20724 Do not wait, act soon.

CONTINUED FROM PREVIOUS PAGE



Use a brush dipped in acetone to insure that splint is attached properly (glue bond over whole surface) to the motor stick. Apply glue to front and rear of splint as well as to the seam.

Once you learn the technique, you can have a badly damaged stick, good as new in a half hours time. The model will retain its original trim for your final all out flights. Also you will have a neat, permanent, high quality repair, with little increase in weight.



CLEAN MOTOR STICK REPAIR

TOM VALLEE

One of the most annoying things which can happen is to have a motor break at a major contest, crushing the motor stick of your best FAI stick or Intermediate stick, usually just behind the bearing or just in front of the rear hook.

My method of emergency repairs works pretty well for me. First of all, the idea is to repair the model so it is as good as new, assuming its original shape so that your adjustment is not changed.

My system is as follows. First to be prepared for such an emergency, I always carry a small plastic box containing short sections of balsa tube about the same diameter as a typical motor stick. Use thin motor stick stock or better yet, make the tubes from tail boom stock.

To start a repair, you take a water brush and apply same to the crushed area of the motor stick. The motor stick will absorb the water and try to assume its original shape. It won't do this completely by itself, but with a little help from you, it should be possible to restore the original shape.

While the motor stick is drying (about 8 to 10 minutes) cut a short "splint", usually about an inch long to cover the crushed area of the motor stick. When the motor stick is dry, apply cement to the "fracture line" in the crushed area of the stick. Apply a coating of thinned cement to the surface of the crushed area. Open the seam of the splint so you can apply the splint over crushed area of the motor stick.

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as done by

FRITZ MUELLER

In Flying Models December Issue Larry Kruse FF Sport feature there was a photo of a large stack of lightweight spoked wheels. Fritz Mueller was the maker and Larry was kind enough to forward my request for construction information on the Fritz. There is a bit of editorial comment in "()".

Making wheels is a hobby by itself, I must warn you, once you start, you can't take your fingers off! So I made a bunch of wheels good enough to pass, far from perfect, but light: eight of them weigh 0.6 gram or 20 of them weigh 1.5 gram.

Making tires: In the past I tested all kinds of schemes to make tires, but two piles of balsa for each half tire works best. For one pair of wheels cut balsa strip long enough for eight (8) tire rounds, wide as the tire diameter. Allow for errors in width and length. Sand down this strip to slightly less than 1/4 of the tire thickness. Dope, dry, sand, dope, and dry. use thick dope. Cut in squares and glue pairs of them together cross-grain with Ambroid. Use brass center to hold compass securely in place. As the brass center (detail # 3) is asymmetric it is easy to relocate it in the same exact position after removal by reinserting it into the imprints left in the balsa. Use the cutter (detail # 2) in a compass to cut the tires. Note: The cut in balsa is smooth when doped, dried under a heat-lamp and cut right after cooling. Only cross piled tire halves will maintain roundness. They warp when contacted with water or soaked through with thinners contained in glue and dope. Use thick dope, apply in spots and not throughout. Cut outer diameter of all four (4) disks without changing compass setting, move the center from ply to ply. Sand the outer perimeter round, apply a heavy layer of dope where sanded and also at the flat part, where the spokes will be glued. Let dry, cut the center out, round off the inside and dope the sanded part only.

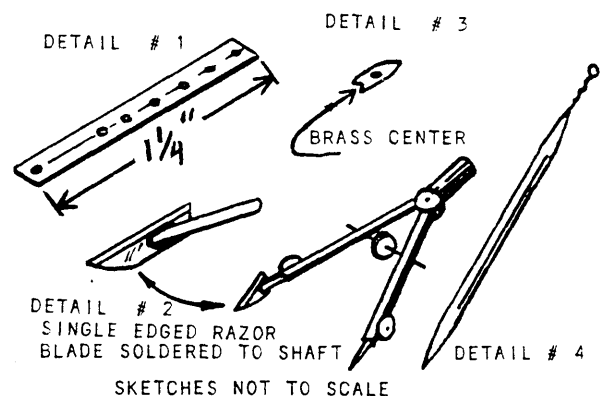
Making the hubs: Roll doped jap. tissue around a polished 1/32 inch rod. To roll such small tubing you best go in steps. First roll the tissue cut to size around a larger rod, say 1/16 inch, then insert a smaller rod, roll it in your palms to this smaller size and proceed until you reach the 1/32 inch ID. Unwind all but the last two turns, put thick dope fast and sparingly on the stretched part and re-roll with the palm of your hand. Pull from the tubing while wet by twisting the rod in the unwinding sense. (Many indoor builders would do this in one step with wet thinned Duco and be quick to slide it off the mandrel. Some might want to use thin walled Teflon tube on the mandrel and leave the Teflon in place as a bearing) Make another much heavier paper roll wound around a 3/64 inch rod. After drying slide the tubing back on the rods. the length of the hub is about 5mm for a 1" wheel. On that you glue with thick dope or thinned Ambroid thin slices of the larger tubing. (These for the hub flanges)

Formula for winding jig: The number of pins divided by two must be uneven. So if you can make a jig for 6, 10, 14, 18 etc. Hungerford uses 18. The base of the jig is level hard

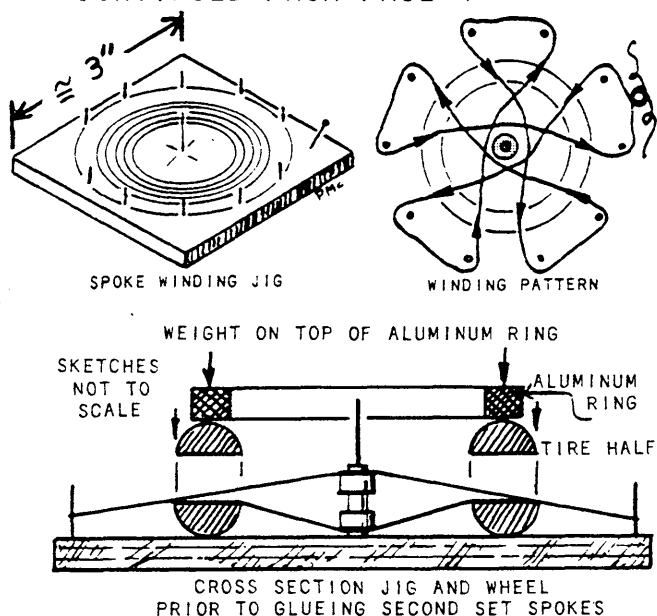
ply, sprayed with white Folquill. The pins are made of 1/32" piano wire, somewhat pointed, but not sharp. Pre-drill smaller holes with a drill press to be perpendicular, fill them with Ambroid and drive the pins held plumb with another jig. Place the somewhat longer center pin first, slide first hole of the aluminum strip (detail # 1) over the center pin and draw the rings with a pencil inserted in the other holes.

Lay down the half-tire, flat side up. Hang the silk (button-hole silk thread) at "S" for start, go around the first pin on the right side, around the center on the left and pass the opposite pin again on the right and continue sort of weaving yourself through. Use the wire loop (detail # 4) on a balsa stick (sample Fritz sent used a square toothpick) to guide the thread around the pins and keep the spokes very loose but uniform. Slide the hub down on the center pin until the silk gets tight, see that it rests on the shoulder of the hub. Apply thinned dope just in the center, but do not spill any on the shaft! I apply dabs of thinned Ambroid where the spokes pass over the tire, let dry. Cut all the spokes at the outer fringe of the tire, weave in the second set of spokes, rotate the tire so the second spokes somehow match the gaps of the first ones, dope the center spider. pre-glue spokes and tire. The spokes are not now touching the tire because they are wound on the top shoulder (flange) of the hub. Pressing down on them will tighten the silk. To make them stay down, I first put a dab of thick dope where each spoke goes, press the upper half of the tire down on them, place a aluminum ring (sized the same as the tire) on top and weigh down with a 12 ounce iron block.

Making a single pair of wheels is time consuming, because of the drying times between the working steps. all the binders have to be nitro-based for lightness and to be repairable. (Fritz used Sig nitrate dope where dope was used) Before I started I figured all the sizes needed in future projects and made 20 wheels in one lick. You can interlace steps, while the dope is drying on one pair, you are sanding the next, then glueing the first etc. When trying of work on the model in between, my brain froze - once you are at it, it is better of concentrate on those wheels, completely!



CONTINUED ON PAGE 5



Making Foam Wheels By Paul McIlrath

FROM MAX - FAX news letter of
D.C. Maxecuters \$ 15.00 /year and
worth every cent. Plan sheet, two
slick photo pages. Treasurer:
Frank Rowsome
10904 Bellehaven BLVD
Damascus MD 20872

Phone: 301-253-0576

Very Light, realistic wheels up to about 1-1/2" dia. can be made from two layers of supermarket food tray foam. Foam sands fast and before-assembly, painting is easy with colored ink or foam-compatible paint. Use paper axle washers indoors and metal or ply outdoors.

1. Pierce center hole in foam sheet and reinforce with tape. Bind & glue a chip from a single edge razor blade in the pencil from a cheap compass - 1/4" projection. Cut tire O.D. (two blanks per wheel) with compass blade vertical. Use sawing motion to prevent gouging.

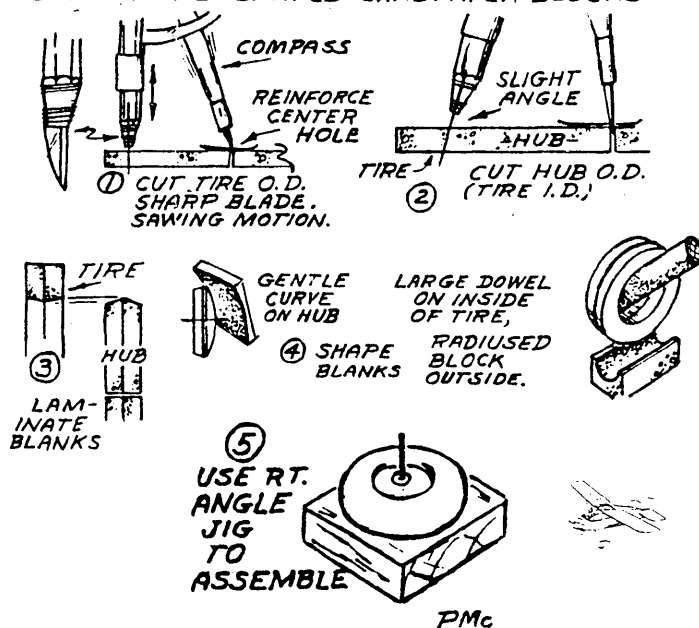
2. Cut I.D. of tire (O.D. of hub) with compass blade at slight angle.

3. Assemble blanks separately as shown. Use glue stick (sands easily) or white glue. Dry overnight. A bit of ink or graphite in adhesive makes glue line visible for easy sanding reference. Repeat: Match blanks as shown for snug hub/tire fit.

4. Round inside of tires with large dowel sandpaper block. Sand outside with radiused block. Shape hub with large radius block. More sanding details: **SANDPAPER - MODEL AVIATION, Nov, '91.**

5. Paint parts before assembly. Glue hub in tire and washers on hub (white glue or RC 56) using a dummy axle wire held in accurately drilled hole in wood jig block.

MAKING FOAM WHEELS USING A COMPASS CUTTER AND SHAPED SANDPAPER BLOCKS



MODEL BUILDER

M.B. is giving great coverage to gum band models especially indoor. The December 1992 issue has a construction article by Ken Johnson for a pair of Mini Sticks with a full sized plan. No idea how much lost income for M.B. from lack of plan sales. But in the case of Mini Stick reduced sized plans would be the size of a postage stamp. Same issue had two pages on innovations at USIC by Dave Linstrum and the regular Hannan's Hangar always has something of interest.

Flying Models and Model Aviation have frequent features of rubber power and regular columns of interest to us. The editors of these publications know that active indoor flyers make up a small percentage of modelers but they also know that these light weight creations contain the essence of flight and that their appeal goes far beyond those who actively build and fly them.

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Balloons, Poles, and Steering

RAY HARLAN

Introduction

Since the seventies, when the British introduced it, steering has been the bane of existence for most indoor modelers the world over. This article attempts to describe acknowledged techniques, the equipment needed, and how to put it together. Methods for retrieving hung models also are covered. Since contests are won or lost through steering, it is hoped that this article will encourage you to learn the fundamentals and gain the confidence needed to put you in the winners' circle.

Equipment

Helium displaces air with a buoyancy of about one ounce per cubic foot. For steering in a large facility (one hundred feet high) the net lift should be more than six ounces. This is needed because the balloon acts like a heavily damped, inverted pendulum and will not follow the steerer's moves quickly enough if there is insufficient lift. There is nothing more frustrating than trying to contact a model, rapidly getting into trouble, with a slow balloon.

Ten pound test monofilament nylon is a good choice for the line. 150 feet of it weighs something near an ounce. A 20 foot steering tube made of 3 mil polyethylene (one inch plastic bag stock) also will weigh roughly an ounce. The balloon itself weighs one or more ounces. Therefore, a balloon displacing nine or more cubic feet is required for high ceilings. A seven or eight cubic foot balloon is adequate for lower sites.

A 30 inch diameter spherical balloon will displace about eight cubic feet. A 33 inch sphere gains two more cubic feet. These sizes will provide reliable steering for all conditions. However, balloons don't inflate truly spherical, so it is better to err on the large side. For small sites, a smaller balloon actually may be preferable, in order to get into girder work to dislodge a hung model. The steering response will be good, since the line is short. Inflating a large balloon (4 to 5 feet diameter) to 30 to 35 inches can have the advantage of more resilience and it will be less likely to explode if it touches a sharp object. However, the larger balloons are very expensive.

Attaching steering tubes to lines and to balloons probably is as varied as there are numbers of balloons. For steering tubes, tie an overhand knot at the bottom end to close off the tube. Then tie the line to it with several overhand knots. Monofilament must be tightly knotted to itself or else it can come loose. In all of this, try to make a smooth transition from tube to line so that if a model inadvertently slides down the tube, onto the string, it will not be caught and potentially damaged. At the top end of the tube, a tee fitting (supplied by Harlan) can be used to provide a fill port and to attach a small auxiliary balloon (about 8)10 inches in diameter) which serves as a plenum to keep the tube filled even if there are some small leaks. Hold the tee as you would read the letter T and insert the vertical leg into the steering tube. Wrap the tube onto the fitting, above the small hose barb, with carpet thread, sealing the tube well. Do the same at one of the other legs to seal the auxiliary ball.

The main balloon can be sealed in many ways. Several wraps of heavy twine can do it. Leave enough extra after tying a few knots to make a loop in the end for hooking up to the steering tube. Some British fliers fold the nozzle of the balloon over a 1/8" wood dowel and lash them together with a couple of small rubber bands. This method is easy to remove, but still requires some string to connect to the steering tube. A short piece of monofilament or twine tied to the tee fitting on the steering tube and to a small fishing swivel catch makes for easy coupling to the balloon.

The reel deserves special attention. Too many modelers use very cheap reels and spend a lot of time untangling line. A good spool type reel (Penn 209 or

210) with level wind mechanisms are worth the cost. Spinning reels are inappropriate because the bail must be cocked to release the line and the line can't be controlled without letting it slip between fingers. Bait casting reels have the same problem and an added one. Because the spool is covered, and the handle is stationary when line is released, it is difficult to observe line moving slowly out the reel. This leads to the possibility of cheating by stopping the prop of a descending model on the tube or line, and, while steering to another position in the flying site, slowly allowing the model to gain altitude. At a meet where I was CD'ing I observed the line near the exit hole wiggling while one flier was steering his model a generous distance from where he engaged the model. Since the monofilament has a permanent coil set to it, the wiggle clearly indicated.

Many fliers use a short rod with its reel. It provides extra control in case the balloon needs to be moved away from the model quickly, by swinging the end of the rod. A stiff, four or five foot collapsing rod is ideal. The rod also adds some weight to the reel; some light reels can be lifted by large balloons.

A latex balloon is porous and will not maintain its lift over night. At a multi-day contest, these balloons require topping off each day. If you leave a balloon inflated for long periods (say a month), most of the helium will leak out. However, just topping it up for the next contest may not be smart. Water vapor has a very small molecular structure and can penetrate the balloon almost as easily as helium. A lot of the gas in that mostly deflated balloon could be water vapor with no lifting power whatsoever.

This brings us to mylar balloons. A few people, myself included, have experimented with mylar balloons. They are fairly difficult to seal because they require the right heat to do so and a sliding hand iron can burn and pull the mylar. Professionals have a hot rolling wheel device to seal edges of special balloons. Standard mylar balloons are stamp sealed. They all are too small for steering. Making mylar balloons by hand is tedious and very time consuming. My six)segment balloons take over three hours to construct. The greatest advantage of a mylar balloon is that it will never explode if it hits a sharp projection on a girder, since it is not pressurized. Although exploding balloons are rare, they have taken their toll of models. Another advantage of a well-sealed mylar balloon is that it does not need topping each day.

Steering with a Balloon

In low ceiling sites, steering is relatively easy because the balloon responds to the steerer's movements quickly and he can see the relationship between the tube and model easily. The real challenge is in high ceiling sites. Therefore, it is important to practice and gain confidence in low ceilings before tackling the job in a blimp hangar! Steering should be initiated when the model is in the part of its circle farthest from impending collision. This takes planning and careful execution. Don't wait until the model is a few feet from disaster; always watch the model and mentally predict where it will be a few circles later. If it clearly is drifting toward the girders, or another model is approaching the circle your model is tracing, get to steering. One caveat, however: it is generally accepted practice for impending model collisions to request that the flier whose model has been in the air the lesser time to steer his model. This is the best solution if that flier is competent, and offers the least risk to the longer flying model. Unfortunately, it is all too common for a flier to hesitate steering because he is inept, and excuse this in action by denying any impending collision. If your model has been in the air longer, press the other flier to steer, but be ready to steer your own model if he balks.

Before attempting to steer, be sure the balloon is high enough that the model will contact some portion of the steering tube. In high sites, you may need help from fellow fliers ten or more yards away from you to judge balloon height.

CONTINUED NEXT PAGE

The best steering technique literally stops the prop and continues to move the model at its normal flying speed, but in a direction different from its flight circle. To execute this maneuver, walk the balloon in a circle that is inside the flight circle and that is tangent to it at the point where you want to begin steering. This means that the steering tube will converge on the motor stick near the left wing leading edge. Never approach the model from the right side. If the prop catches the tube, it will not release. The speed of the model should not change and as the tube is moved forward, the prop is caught and stopped. Then the direction of flight can be changed to avoid the obstruction. Do this slowly, but always keep the model moving at its normal flight speed.

Proper speed is extremely important; you will learn to walk at that speed without hesitating. If the model stops, the tail will drop and the model will begin to rotate about the motor stick if the prop is caught. Righting the model can be nearly impossible if it has rotated more than 15 or 20 degrees. If the prop has not been caught, and the model stops, it can slide down the tube enough to constitute an illegal steer.

Once you have reached the point where the model should be released, the procedure depends on whether the prop is stopped. If it is not, simply walk and/or swing the pole forward and to the left of the flight path to clear the model. If the prop is stopped, a slight downward pull should free it and the same forward/left move will clear the model.

So far, steering at altitude has been discussed. But there is one more important use of a balloon. The sixty-second official-flight rule permits stopping the model by any physical means. Therefore, if the model is not climbing correctly after launch, the balloon can be used to stop the flight. Have your timer call out each ten-second interval so you can judge when to approach the model if necessary.

Steering with a Pole

When models are flying below 15 feet and must be steered away from obstructions on the floor, a telescoping fiberglass pole is the instrument of choice. There are several makes available. Most are called "still water" fishing poles and telescope to 20 feet. The last section is very thin and whippy. It is best not to use this section because it can easily damage the model if you are the least bit unsteady in steering.

Because the model most likely will not be steered from below, the technique differs from that with a balloon. The model is carefully pushed on the front of the wing, preferably near a dihedral joint where it is strongest from the bracing. This area is pushed backwards, causing the model to pivot in the air. Since some of its forward momentum is lost with this steering motion, the model often stalls, but recovers quickly. Although altitude is lost, the alternative of hitting an obstruction is worse.

Retrieving Models with a Balloon

Inevitably, models will hang up on the girders. Getting them back can be fairly easy or a real challenge, depending on how they are lodged. If a model is just hanging from a girder by one prop blade, a balloon can be brought under the girder beside the model. If the model is rotating from motor torque, wait until its bottom faces the balloon, then gently contact it with the balloon. Move the balloon out and up to level the model, then raise it from its perch. If you are fortunate enough to sit the model on the balloon, slowly lower it to the floor to retrieve the model. Most often, the model slips off after being freed from the girder and doesn't lose much altitude, provoking the opportunity to hang up again after a few more circles. If this occurs, catch the model on the steering tube, stop the prop and slowly wind the line in. Don't let the model slide down the tube or line; damage can occur if the model assumes a bad attitude.

When a model sits on top of a girder, how it is retrieved depends on how much of the model is visible and how the prop is caught. Also, how much room there

is above the girder plays a role, for if the front of the model is clear and there is room for a balloon above, the prop can be snared on the steering tube and the model can be lifted off. This is a rare circumstance. Occasionally the tail is visible and the prop is past the other side of the girder with one tip snagged. A careful push with the balloon on the bottom of the stabilizer can move the model off and limit damage to a broken rudder.

If very little of the model shows past the girder, a balloon by itself is useless and will only serve to damage the visible parts of the model when the flier gets frustrated and bashes a little harder. It is time to add to the ballooning arsenal. Peel the balloon in and attach a stick of 3/32 or 1/8" square balsa, 3 feet long, to the top of the balloon with a small piece of drafting tape about 4 to 6 inches from the end of the stick. This tape is preferred over masking tape because it can be peeled off easier. Support the stick in a horizontal orientation by two diagonal braces to the lower portion of the balloon. All of it can be taped together. Tightly tie a second balloon string (less balloon and steering tube) to the tail of the horizontal stick. This will be used by a second person to orient the stick.

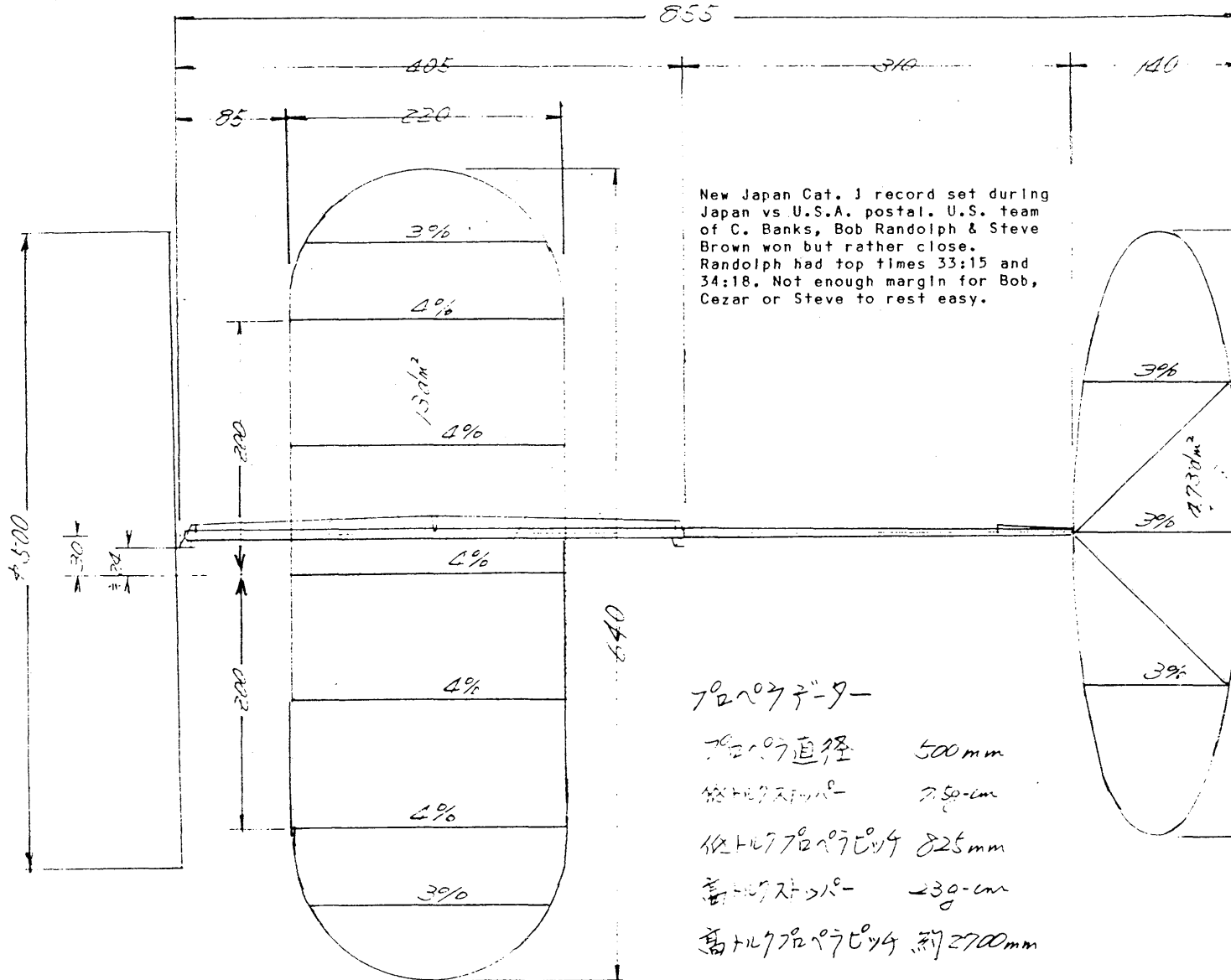
Move the balloon back up near the model. The second reel is released at the same time and the holder moves away from the balloon so that his line makes an angle of about 45 degrees with the floor. A third person acts as an observer and orchestrates each person's moves so that the balsa stick can be maneuvered under the wing in a chordwise direction, near the center of the wing. In high sites 7X50 binoculars and a chair or chaise lounge are mandatory for the observer. Commands to move a few inches at a time are given and the retrieving rig is allowed to settle between them. When the stick is under the wind, the model is then raised to free it. Some forward motion may be required to free the prop. Although it sounds complicated, this technique can be quite successful and can result in no damage to the model. Naturally the model is reeled to the floor and not released from the stick.

Occasionally, a model will be entangled in a hanging string. This occurs most frequently in gymnasiums where parties are held. Small helium balloons are released, they eventually deflate, and their strings hang over the girders. There is no way to untangle a propeller that has gotten wrapped up in one of these strings. The solution is to return to the retrieving rig described above and super glue two halves of a double-edged razor blade to the horizontal stick so that the halves form a vee beside the stick, with the cutting edges inward. When the offending string is snagged in this vee, a slow tug on the orientation line can cut the string and not jerk the model so as to damage it. If the model gets caught in the part of the string where the balloon is attached, cutting it free in this manner may cause the model to plummet to the floor due to the added weight of the balloon. At least you will get the model back!

Retrieving models often calls for ingenuity because the balloon or line can't always reach the model. The techniques described here provide the basis for most successful efforts, but variations may be necessary. If you want to become an expert, always offer to help someone who is timid about retrieving his model. He'll be grateful to get it back, even if slightly damaged, and you'll get some practice without breaking your own model.

Editors note: Ray would not mention it but he is a supplier of balloons and tools for the indoor flyer. His balance is the standard, about one mgm + or - & less than \$100.00. Send \$2.00 for information

Ray Harlan
15 happy Hollow RD
Wayland MA 01778



プロペラデーター

プロペラ直径 500mm

低トルクストップ 7.50-cm

低トルクプロペラピッチ 825mm

高トルクストップ 230-cm

高トルクプロペラピッチ 2700mm

プロペラジグピッチ 800mm

See SITE AND CONTEST lists this issue for address of Tom Vallee. He is U.S.A contact for 1993 F1D and MINI-STICK postal contests.

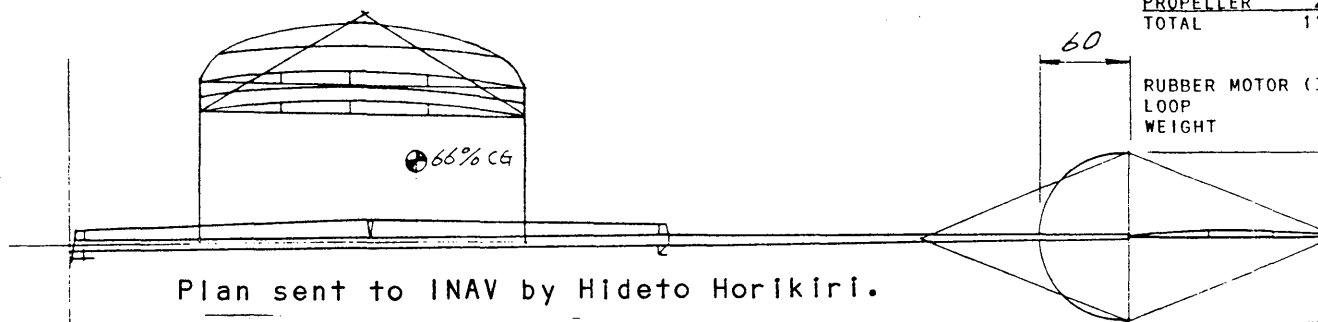
PROPELLER DATA

DIAMETER	500 mm
LOW TORQUE STOP	7.7 gm cm
LOW PITCH	825 mm
HIGH TORQUE STOP	23 gm cm
HIGH PITCH ABOUT	2700 mm
PROPELLER ZIG	800 mm

DRAWING

才三角法

MOTOR STICK	3
MAIN WING	3
TAIL BOOM	2
PROPELLER	2
TOTAL	10

RUBBER MOTOR (3)
LOOP
WEIGHT

Plan sent to INAV by Hideto Horikiri.

Translation Mr. and Mrs. Michael Han
of Marion, Iowa.

DESIGN & FLIGHT BY SATOSHI KINOSHITA

CAT I JAPAN RECORD 31m

神奈川インドアプレーンクラブ

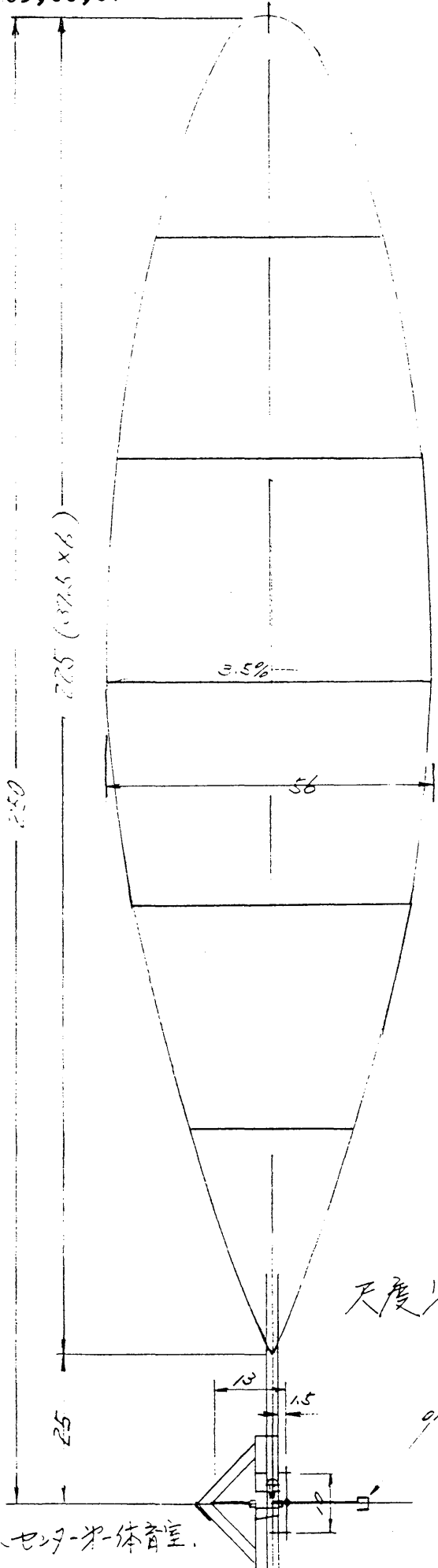
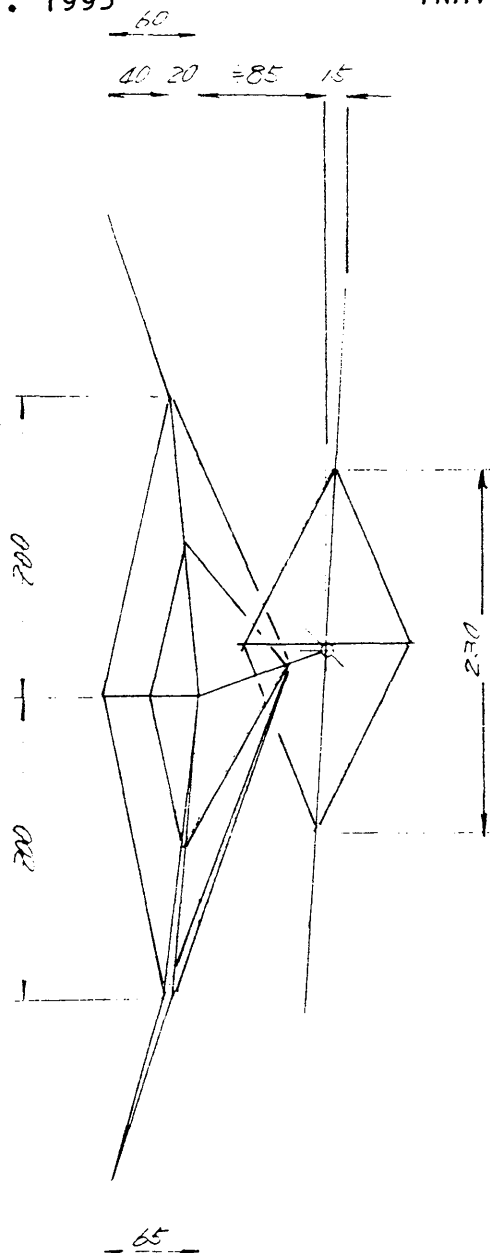
1992. 9.26

KANAGAWA INDOOR
9-26-92 SATO

ホ下 坪

TIME: CATEGORY C

AT YOYOGI GYMNASIUM



SCALE 1/5

尺度 1/5

222 mgm
333 mgm
220 mgm
232 mgm
07 mgm

338mg/10cm TAN
345mm
1166 mgm

29s

AIRPLANE CLUB
SHI KINOSHITA

ONE 31 min. 29 sec.

SUM

エ-ター スティック	322 mg
主翼	333 mg
テール ム 尾翼	220 mg
フコポン	232 mg
機体重量	1107 mg

ゴム (338mg/10cm ル-フ) TAN

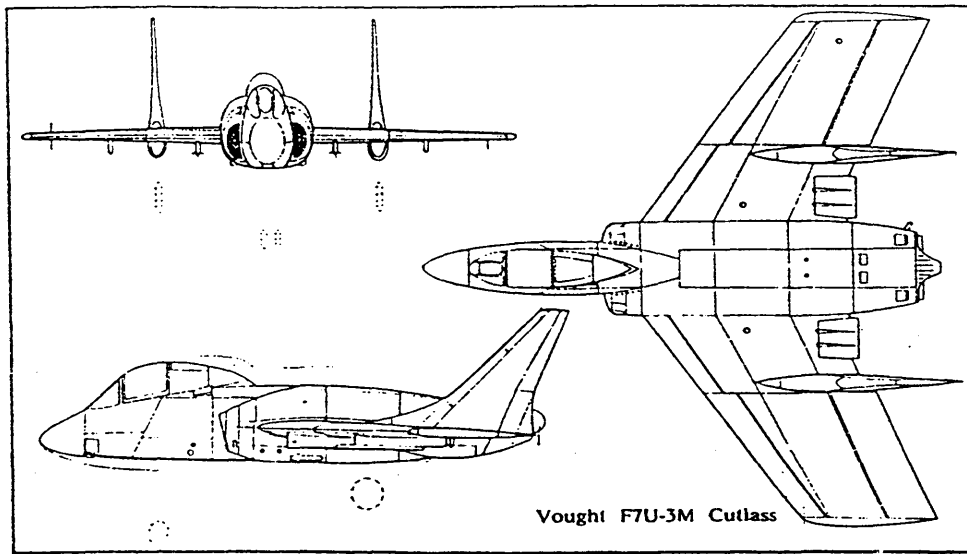
ル-フ 345mm

重量 1166 mg

ベストタイム カテゴリー-1 31分29秒
1992.9.25 代々木 青年総合センター-体育館.

尺度 1/1

9/2



(PROFILE NOSE)

PLAN PAGE 1

FWD
EXT
FOR

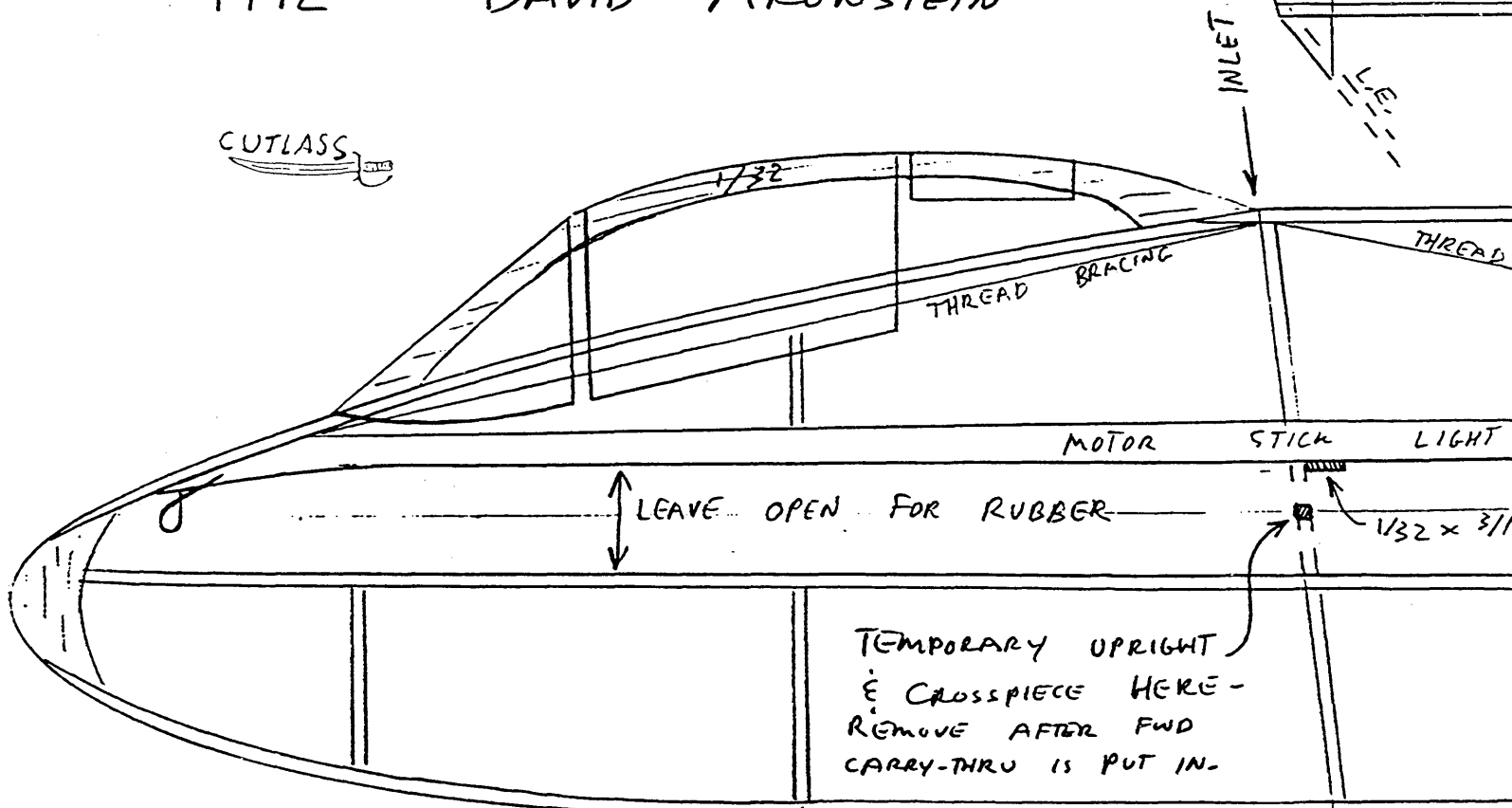
FWD. CARRY-THRU

CUTLASS

RUBBER DUCTED FAN

1992 DAVID ARONSTEIN

CUTLASS

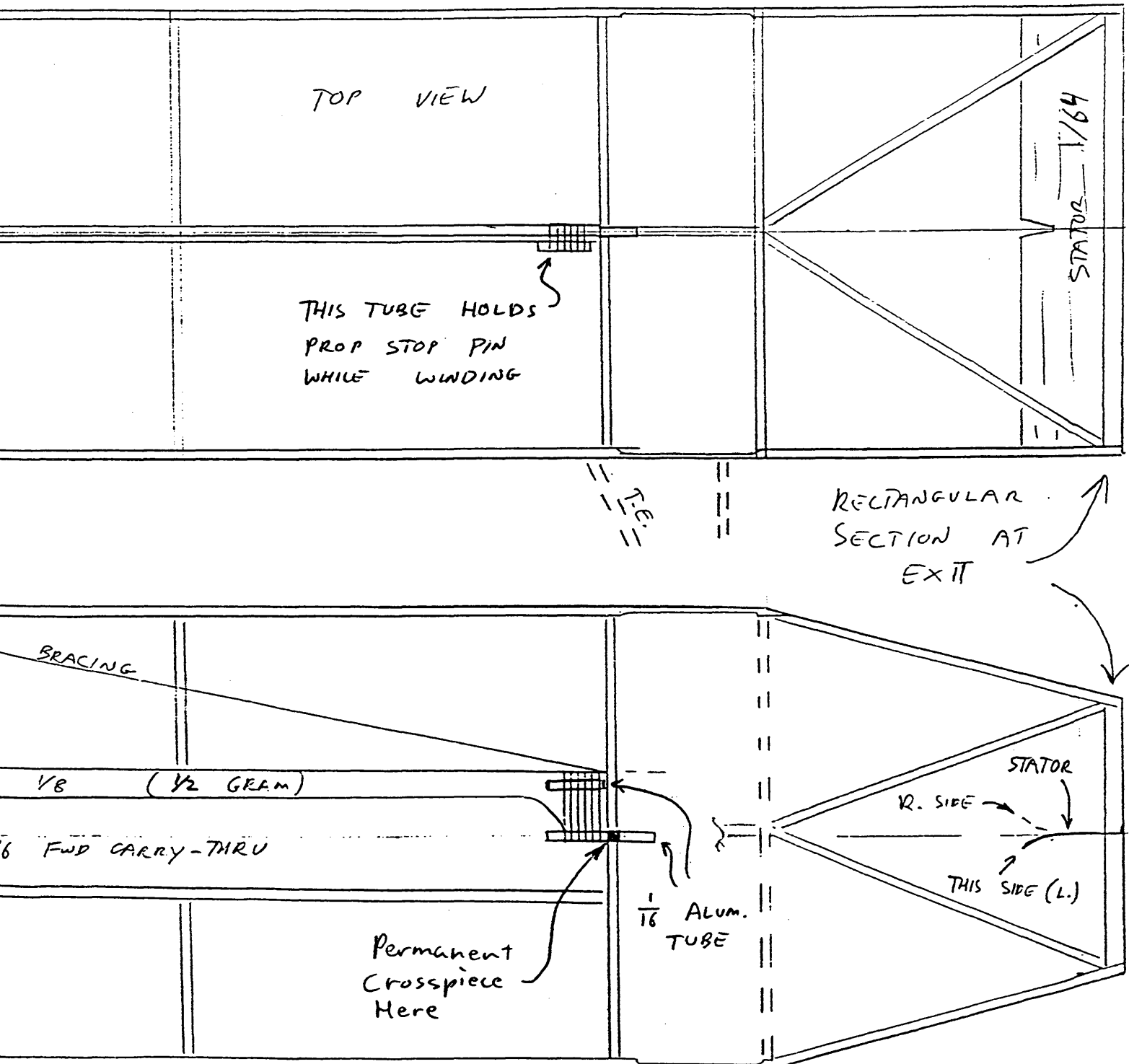


FROM - Newsletter No. 62, June/July 1992
Boeing Employees Free Flight Model Flying Club *
 (* also known as the Boeing Hawks)

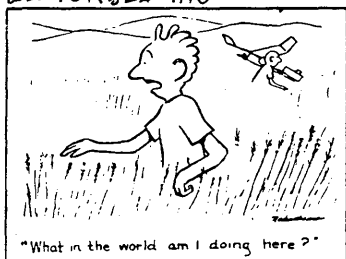
President/
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Andy Page
 2121 SW 152nd St. #202
 Seattle, WA 98166
 (206)431-0887

CARRY-THRU
 UNDS OUTBOARD OF DUCT,
 WING L.E. TO SIT ON.

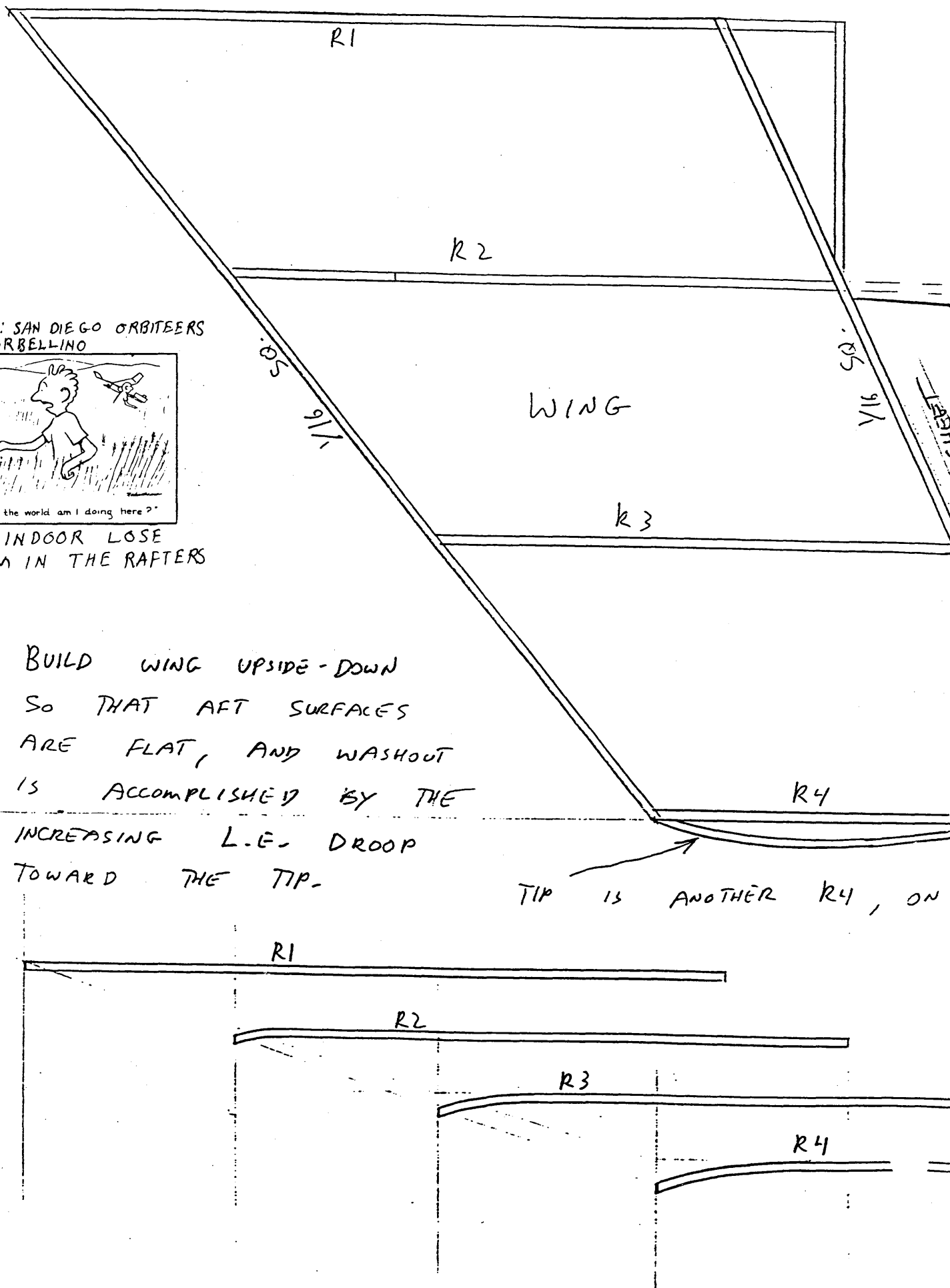


FROM: SAN DIEGO ORBITEERS
EL TORBELLINO



FLY INDOOR LOSE
THEM IN THE RAFTERS

BUILD WING UPSIDE-DOWN
SO THAT AFT SURFACES
ARE FLAT, AND WASHOUT
IS ACCOMPLISHED BY THE
INCREASING L.E. DROOP
TOWARD THE TIP.



TIP IS ANOTHER R4, ON

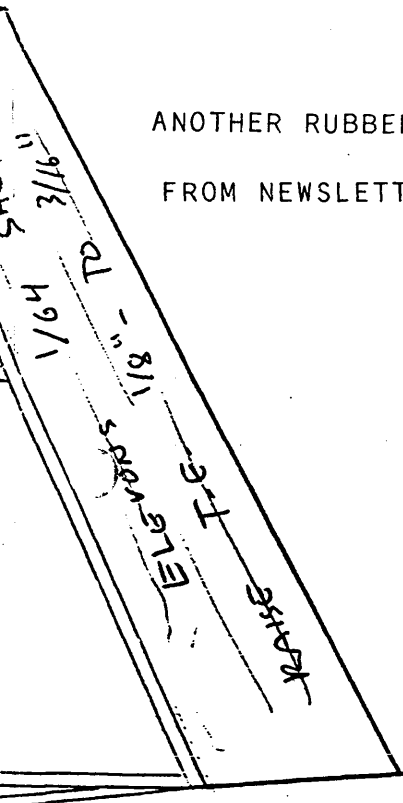
PLAN PAGE 2

CUTLASSRUBBER DUCTED FAN
1992 DAVID ARONSTEIN

MAKE FIRST FLIGHTS
WITHOUT $\frac{1}{64}$ RUBBER TABS
THEN MOUNT THEM AT
WHATEVER ANGLE NEEDED
TO PRODUCE A CIRCLE

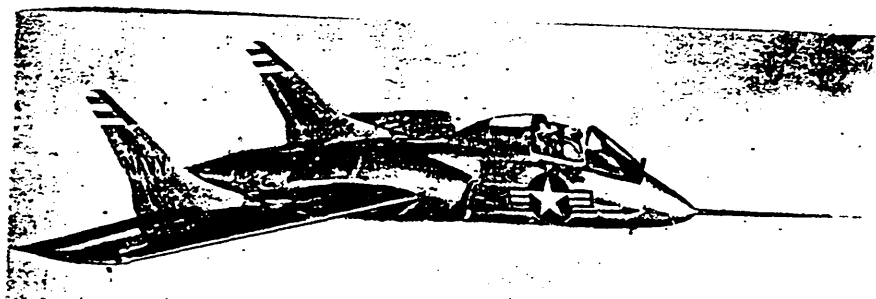
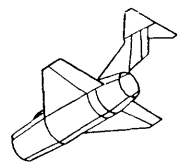
RUBBER
== == == == ==

ANOTHER RUBBER POWERED DUCTED FAN BY DAVID ARONSTEIN
FROM NEWSLETTER OF THE BOEING HAWKS



ITS SIDE

RUDDER

 $\frac{1}{64}$ $\frac{1}{32}$ 

For both the site list and the contest list be sure to check before going to fly. The listing could be from last year or could be in error. Also things happen that close sites. Most of this list is from Gary Underwood, 9 Treelawn Terrace, Mercerville NJ 08619, Bud Tenny and a few were sent direct to me in newsletters. If you have a site or put on a contest inform Gary and Bud

SITE LIST

AZ Flagstaff Cat IV (147') Red Boyles, 602-838-9602
 CA Burbank Cat I Second Thursday 7-10 PM Tony Nacarrato 818-842-5062 AMA & club contests and FUN fly nights
 CA L.A. Luther Burbank H.S. gym Cat I Ken Johnson 818-368-0448
 CA L.A. Cat II Naval Res. Armory Stadium Way, Ken Johnson 818-368-0448
 CA Marlin CO. Cat II Tom Brennan 707-938-2893
 CA San Diego Collina Del Sol Community Center Howard Haupt 619-272-5656
 CA Santa Ana Cat IV Curt Stevens 714-586-5779
 CANADA Burlington and others Dan O'Grady, 50 Largo Crescent, Nepean, Ontario, Canada K2G3C7
 CANADA Toronto Markam H.S. and C.W. Jefferies Gym John Marett 416-429-0815
 CO Aurora Must help college level Aero Eng. Students John Berryman 303-492-1005
 CO Denver Bill Gibbons, 7422 Clubhouse RD, Boulder CO 80301 Phone 303-530-5526
 CT Glastonbury Fun & Occ. contest George Armstead 203-633-7836
 CT Norwich Jerry Bockius 203 442-8003
 CT Wilton Roger Kleinert, 17 Gardiner ST, Darlen CT 06820 phone 203-655-1585
 FL Miami Cat I Dad Co. Youth Fair fun fly also see FL contests Doc Martin 305-858-6363
 FL Pensacola Jeff Dunlap 214 Sprague Ave Pensacola FL 32534 Phone 904-478-2687
 HI Honolulu Ed Kuramoto, 3856 Maunaloa AVE, Honolulu HI 96816
 IA Cedar Rapids Paul McIlraith, 1524 48th ST NE, Cedar Rapids IA 52402 Phone 319-393-4677
 IA Des Moines Jack Textor, 29 SW 58th DR, Des Moines IA 50312 Phone 515-277-4173
 IL Glen Ellyn (west Chicago) Mon. evenings Don Lindley 708-355-9674
 IL Chicago Cat III Charles Sotlich 312-735-1353
 IL Rantoul Cat II Chanute A.F. base hanger #1 smooth ceiling Chuck Markos 312-945-9225
 KS Topeka Jack Koehlar 913-272-8439
 KS Wichita Stan Chilton, 725 E Lincoln, Wichita KS 67211-3302 Ph 316-686-9634
 KY Louisville Cat I KY Air Nat Guard Hangar and Sawyer State Park Gym. Mason Plank 502-634-8191
 MA Boston (M.I.T. DuPont gym) 40' 1st Sat of Feb, Mar, April, May Ray Harlan 508-358-4013
 MA Andover Cat II Phillips Academy Dom Walworth 603-898-5338
 MI Flint Mc Kinley Middle School Curt Haskell 313-232-0354
 MN Burnsville Cat II John O'Leary 612-888-0638
 MO St Louis Jefferson College 25 Miles S. St L. Larry Coslick 4202 Valleycrest Hills DR, St Louis MO 63128 314-892-3803
 NE Beatrice John Pakiz, 4523 Poppleton AVE, Omaha NE 68106 Phone 402-551-2964
 NJ Union Area Fergus Collins, 48 E Hazelwood AVE, Rahaway NJ 07067
 NM Aztec at H.S. H.S. "Hoby" Clay 5604 Cederwood ST, Farmington NM 87401
 NY Cattergus Park Long Island Cat II Summer only Rich Fiore 516-249-4358
 NY Chappequa Art Malden 914-769-2284
 NY Kingston Cat I Bob Hudson 518-273-7468
 NY Long Island Mithell, Field Cradle of Aviation Museum Bob Bender 212-222-1546
 NY Locust Valley Fred Dippel, 2 David CT, Glen Cove L I NY 11542 Phone 516-671-2858
 OK Tulsa National Guard Armory, George Calvert, RT 4 BOX 188A, Wagoner OK 74467 Phone 918-627-7200
 PA Bryn Athyn cat I Aspinndh Field House Joe Krush 215-688-3927
 PA Philadelphia Cat II Joe Krush 215-688-3927

PA Eastern Walt Eggert, Jr., 26 Moredon RD, Huntington Valley PA 19006 Phone ?
 TX Fort Worth-Dallas Cat I Boys Ranch Bedford TX Jesse Shepherd SR. 817-282-3770
 UT Salt Lake City Cat I San Juan College Gym Jay Jackson 801-485-0314
 UT Salt Lake City Evergreen Jr. H.S. Gordon Pollock 801-278-5636
 VA Newport News Abram Van Dover 112 Tillerson DR, Newport News VA 23602
 WA Seattle Oct. thru April once per month (Saturday ?) Naval Reserve Training Center. Gene Stubbs 2119 NE 81 st ST, Seattle WA 98115 SASE. Phone 206-522-7047 or Ed Lamb, 15911 SE 42nd Place, Bellevue WA 98006 Phone 206-522-7047
 WA Seattle Boeing Hawks Kent Rec Center Andy Page 206-431-0887
 WI Milwaukee Gordon Wisniewski, 4790 Stratford DR, Greendale WI 53129 Phone 414-421-3696 or 645-5454

CONTESTS

CA San Francisco Cat IV Cow Palace Bud Romak 510-376-4624
 FL Clearwater Cat II U.S. Coast Guard hanger Doc Martin 305-858-6363
 FL Miami Cat II Smooth ceiling N.W. 87 Ave and 13th ST Doc Martin 305-858-6363
 FL Tampa Cat III Mc Dill A.F. base Doc Martin 305-858-6363
 FL Tampa Cat III Delta Hanger Annual about New Years day Doc Martin 305-858-6363
 ID Kibby Dome In future. Contact: Andrew Tagliafico, 650-B Tayblin RD NW, Salem OR 97304 Send SASE or 1-503-371-0492.
 IL Sycamore Cat II National Guard Armory Don Lindley 708-355-9674
 KS Topeka TOPMAC-KISMAL April Jack Koehlar 913-272-8439
 MD Greenbelt Goddard Space Flight Center Cat I Record Trials Need prior registration call Tom Vallee 301-498-0790
 MA Andover Cat II March 15 Call Don Walworth 603-898-5338
 MA M.I.T. Record trials Ray Harlan 617-353-4013
 MI Detroit Cat II and III Call Richard Dolg 313-373-5374
 MI Flint Cat I Curt Haskell 313-232-0354
 NJ Lakehurst In future Contact: Kit or Gary Underwood prior as this is military (Navy). 609-586-4441
 NY Floyd Bennett Field Oct., Nov., April, May Contact: Donlad Ross, 38 Churchill RD, Cresskill NJ 07626 Phone 201-568-5272
 NY Buffalo Cat III CAN/AM Jack McGillivray 416-421-1108
 OH Akron Cat IV Goodyear Airdock contact Bill Hulbert prior registration needed 216-864-8030
 OH Parma (Cleveland) Normandy H.S. 48 foot good ceiling March 28(?), (29?) 1993 Contact: Russ Brown 717-392-8093
 OH Cleveland FF Society 10 annual indoor contest March 13 1993 Russ Brown 216-382-4821 or Michael Zand 524-3480 or Larry Mzik 357-7361
 OK OK City Cat I Nat Guard Armory Jim Belson 405-946-1093
 OK Tulsa OK Armory Nov. 8, Dec. 12, Jan. 11 (Probable), Feb. (Prob.), Mar. (Prob.) Contact: George Calvert, RT 4 BOX 188A, Wagoner OK 74467 Phone 918-627-7200
 OR South Albany High School 41 foot clean ceiling and 26 foot Expect Sunday meets- #1 last weekend Nov. or first Dec., #2 first or second weekend Jan., #3 last weekend Jan., #4 late Feb. Expect 2 day meets- May first weekend and late June. Contact: Bob Stallck, 5066 NW Picadilly Circle, Albany OR 97321 - SASE Phone 503-928-8101
 TN Johnson City June USIC/NATS four days of fun In June 1993
 WI Racine Cat II Bong Eagles March 15 Tony Italiano 414-782-6256
 Postal Fld Contact Tom Vallee 444 Henryton S, Laurel MD 20724 SASE NOW FOR '93

POSTAL F1D & MINI-STICK U.S.A. CONTACT TOM VALLEE. There is still time to enter. Send Tom your SASE.

FROM SAM 86 SPEAKS Newsletter of SAM 86 Ontario Canada. 10 issues \$12.00. Check to Dan O'Grady, 50 Largo Cresc., Nepean, Ontario, Canada K2G3C7. Guess U.S. green would be O.K. as it is easy to change in Canada. Foreign checks may be a problem. S. 86 S. has a good indoor section. Might try slitting plastic door clear to bottom to make entry easier. Multiple water shrinking of tissue on a rigid frame does not take all the shrink out. Tissue must have free edges and be DRY.

COVERING INDOOR MODELS IN A HOT-BOX

by Roy Bourke
Markham Indoor Group

In the fall of each year many of us turn our attention to building up our fleet of indoor models ready for those winter flying sessions in high school gymnasiums. But many an indoor modeller has experienced the problem of building and trimming a light tissue-covered model in the fall, then showing up at the indoor site on a cold January day, and opening up his model box only to find his model now resembles a potato chip. The covering tissue finds itself in an atmosphere with a relative humidity (R.H.) lower than any it has experienced since the model was covered, and shrinks beyond the limits of any slack that was built into the original covering job. (Paper responds so drastically to R.H. that it is often used as the sensing element in relative humidity measuring instruments and humidistats.)

The polar and maritime air masses that prevail over southern Canada in the fall, even on cool clear days, have a much higher moisture content (higher dew-point temperature) than the continental arctic air mass that prevails in January and February. When you take cold January air with its low moisture content to start with, and heat it to a comfortable indoor temperature without adding moisture (as is often the case with gymnasium heating systems), the moisture content (and dew-point temperature) remain constant but the R.H. plunges to an extremely low level, and the model covering reacts accordingly.

Heavier tissue-covered aircraft can often survive the added skin stress, but the much lighter structures found on No-Cals, and other ultra-light tissue-covered scale or endurance aircraft will not tolerate any R.H. lower than that which prevailed when it was covered. Taking the precaution of pre-shrinking and pre-doping the tissue on a frame before covering, and applying the covering loosely to the aircraft is often not enough, because even on a clear dry day in the fall the R.H. in your workshop is still much higher than the aircraft will encounter at the flying site in January.

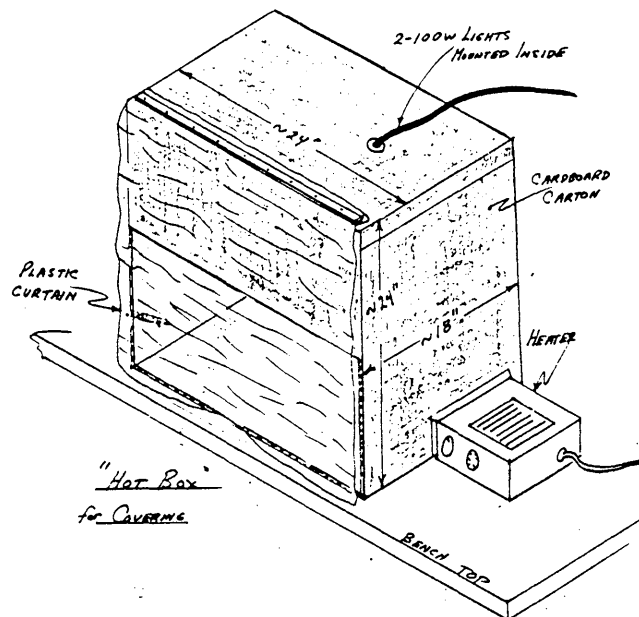
The answer of course is to cover the model in a very low R.H. environment, but you are unlikely to ever encounter such an environment in your workshop. In fall, the prevailing air masses are too moist, and in mid-winter home heating systems humidify the air to a comfortable R.H. level. However, you can create a low R.H. environment with a simple "hot box", large enough to provide working space to apply pre-shrunk covering to the aircraft framework.

A suitable hot box is simply a large cardboard carton; mine is about 24" w x 24" h x 18" deep, sitting at bench level with a cutout at the front for working access, and a clear plastic curtain hanging over the cutout. Raising the temperature of the air in the box with a heater, or somehow removing some of the moisture from the air (lowering its dew-point temperature), or a combination of the two, will lower its R.H. considerably below that of the air in the rest of your workshop.

A simple and safe heater for the box is a pair of 100 watt light bulbs. This not only provides a dry, draft free atmosphere, but illuminates the working area at the same time. Feeding into the side of my hot box I also have a small heater/blower which I use in place of the lights when the box is set up as a drying cabinet, and also to maintain a positive outflow of air when the lights are on (but I turn the blower off just prior to covering operations to eliminate the drafts).

Removing moisture from the air is a more difficult problem. Using a refrigeration-type dehumidifier wouldn't work because winter air has too low a dew-point temperature. I sometimes put several bags of desiccant in close proximity to the tissue covering material, both being placed in the hot box about an hour prior to covering. However, it is debatable whether this addition of desiccant is really necessary, since heat alone seems to produce an adequately low R.H. environment in the box.

Since using the hot box for covering all my tissue covered indoor aircraft I have not experienced warping in any of the indoor sites I have flown in. Working in the hot box is no problem for aircraft the size of No-Cals and the smaller sizes of indoor scale aircraft, but if you build Jumbos a larger box might be appropriate. My hot box stays set up in my workshop at all times, because I also find it very handy as a drying cabinet to accelerate the drying of prop blades, motor tubes, and other formed balsa elements, glued structures, painted or doped pieces etc. In fact, apart from model aircraft, I have found mine useful for drying all sorts of varnished or painted household items that are small enough to fit into the box. I suppose with appropriate modifications it could also be used as a spray booth.



INDOOR MATERIAL SUPPLIERS form VOL LIBRE

via BAT SHEET N.L. of the Strat-O-Bats

With notes and added listings by your editor.

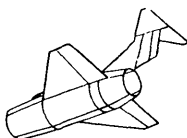
NOTES on SUPPLIERS

I know you old timers have seen this list but your beginners have not so make copies and a few notations for your new flyers. Jones has a good balsa stripper and good selection blades. Note he has a new address. Same house just address change. Jim had a bad leg fracture and may or may not be able to fill orders by January. Inclose a SASE. Harlan has the most sensitive balance this side of \$2,000. His about \$100 balance is good to one or two mgm. His balsa stripper uses two micrometers and a unique blade holder. If you want to waste money and go for ease of use go to George at Champion Model Products. He has a full line of ACCULAB scales. The C/50 accurate + - 2 mgm capacity 10 grams. Be warned get over 15 grams and it may be trash.

Do not forget mention INDOOR NEWS AND VIEWS when you order from these suppliers.

Small Parts Inc.
13980 NW 58 th Court
P O Box 4650

Miami Lakes FL 33014-0650
All sorts of small to very small stuff. Minimum order \$15.00 no postage do not worry you will find enough to get to \$15.



Ernst Johnson Few No-cal & many
Flying Start beginners plans.
10460 Ambassador DR
Rancho Cordova CA 95670

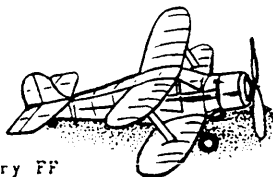
Aircraft Data

Box 763576, Dallas, TX 75224

Peanut plans & book:

"Making Scale Model Airplanes Fly"

Bill McCombs book is something every FF Scaler should have in his/her library. It is extensive and intensive, and should answer most any question a beginner in this branch of the hobby should have. \$12.95PP. Highly recommended.



CO2 and Mini Electric

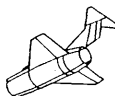
Free Flight Unlimited - R. Linwood Cochran, owner is source for Brown Jr, Davis Diesel/Cox and Modela motors and all kinds of CO2 accessories. He also has lines from other free flight cottage industries. He gives a 10% discount to NFFS members. How is that for support of FF? Send \$1.00 for catalog. 6769 Angels Lane, Tucker GA 30084-1302, USA

Jim Jones
ABS
36631 Ledgestone DR
Clinton TWP MI 48035

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Andover MA 01810

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Guide to plans, kits of over 8,500 models from 25 countries. All have noted span, if FF, U/C or R/C (ugh), designer, price and source. 304 pages, softbound, 9 X 6. Good reviews. Available from:

HANNAN'S RUNWAY

Box 210, Magalia, CA 95954

Send \$1.00 (refunded with order) for the latest listing. All kinds of good stuff like "Do You Speak Model Airplane." It has nothing to do with building or indoor per se but Dave Thornburg's history of modeling in the U.S.A. is a very well researched and written story of how we got where we are today. As a lot of obscure stuff. 320 pages, softbound, 5.5 X 8.5

F.M. Warplanes \$14.95 + post \$3.00
Speak Model Airplanes \$19.95 + post \$3.50
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VISA & MasterCard Call 916-873-6421

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TEMPE AZ 85283 evenings & weekends

Here in one place you will find about 20 NO-CALS, a set of 6 Peanuts, a raft of FAC type scale models, a few Models of Models and about eight documentation packs for the serious scale modelers. Prices are reasonable. Send a SASE and \$1.00 for green price sheet if you are the only gum band modeler in the northern hemisphere who does not have it.

Random Notes : The ACCULAB scale sold by George S. at Champion Model Products is a fine piece of equipment. I have the C/50 and a larger model and have been happy with both of them. George is very helpful. For value and accuracy it is hard to beat the Harlan balance. The stuff at Edmunds is over priced as compared to Champion or Harlan, but they are a source of mass sets.

Have just read Thornburg's "Do You Speak Model Airplane" and it is great. Hannan's Runway will send you your own copy for \$23.45 post paid. Tell them INAV sent you.

'A' Aviation .
12235-48th Av. S.
Seattle WA 98178
Owner: Dave Aronstein
Plans for Dave's winning designs;
cat. \$2.00

DAVE IS FULL OF
GOOD IDEAS. TWO
DUCTED FAN PLANS
IN INAV THIS
PAST YEAR. HE
STARTED "FLAT"
BOSTONIAN (I THINK)

LISTINGS CONTINUED NEXT PAGE

LISTINGS CONTINUED FROM PAGE 16

INDOOR MATERIAL SUPPLIERS form VOL LIBRE

via BAT SHEET N.L. of the Strat-O-Bats

**Champion Model Products**

880 Carmen Ct., LaVerne, CA 91750
Owner: George Schroedter
ACCULAB electronic scales

Clements Plans

308 Palo Alto, Caldwell, ID 83605
Owner: Vern Clements
1930's scale plans: cat \$3.00

Diels Engineering

Box 101, Woodville, OH 43469
Owner: Dave Diels
Excellent scale kits and plans:
cat \$1.50

Edmund Scientific

101 E. Gloucester Pike
Barrington, NJ 08007
A scale for every budget; cat \$5.00

FAI Model Supply

Box 3957, Torrance, CA 90510
Owner: Ed Dolby
Tan & black rubber in bulk,
rubber lube; cat \$1.50

Golden Age Reproductions

Box 1685, Andover, MA 01810
Scale kits & Plans; cat \$2.50

Hall's Books

Box 658, Plaistow, NH 03865
Owner: Fred Hall
"Indoor Scale Model Flying" book

Hannan's Runway

P.O. Box 860, Magalia, CA 95954
Owner: Bill Hannan
"Peanuts & Pistachios" Vols. 1-5 &
Plans

Harlan Mfg.

15 Happy Hollow Rd.,
Wayland, MA 01778
Owner: Ray Harlan
Ultra film, scale, balsa stripper,
rubber stripper, prop bearings

Hirsch Scale Drawings.

8439 Dale St., Buena Park, CA 90620
Owner: R.S. Hirsch
Beautiful raceplane 3-views

Indoor Model Supply

Box 5311, Salem, OR 97304
Owner: Lew Gitlow
Complete line of indoor supplies,
plans, wood & kits; cat \$2.00

Jones Mfg.

36631 Ledgestone
Clinton TWP MI 48035
Owner: Jim Jones
Balsa stripper, prop jigs, indoor wood

Lidberg Plans

614 E. Fordham, Tempe, AZ 85283
Owner: Al Lidberg
No-cal and scale plans; cat \$1.00

Mace Model Aircraft Co.

359 S 119th East Ave., Tulsa, OK 74128
Owner: Don Mace
Indoor scale & duration plans

Micro-X

Box 1063, Lorain, OH 44055
Owner: Jerry Skrjanc
Complete line of indoor plans and
supplies; cat \$1.50

MRL

25108 Marguerite Pkwy #160
Mission Viejo, CA 92692
Owner: Curt Stevens
Kevlar thread, boron fiber,
mylar, graphite

Netcraft Co.

2800 Tremainsville Rd.
Toledo, Oh 43613
Telescoping fiberglass poles

NFFS Plans

10115 Newbold Dr.
St. Louis, MO 63137
Contact: Bob Klipp
"Winning Indoor Designs" book

Nowlen Aero

139 Boardwalk B
Greenbrae, CA 94904
Peanut scale kits

Oldtimer Model Supply

Box 7334, Van Nuys, Ca 91409
Owner: Ken Sykora
Selected indoor supplies, scale plans,
cat \$2.00

Oppegard Mfg.

140 E. Golden Lake Lane
Circle Pines, MN 55014
Owner: Bob Oppegard
Fine quality rubber stripper

Peck Polymers

Box 710399 MB, Santee, CA 92072
Owner: Sandy Peck
Tissue, rubber, plans, winders,
accessories: cat \$2.00

Pond's Plan Service

Box 90310, San Jose, CA 95109
Owner: John Pond
Huge list of scale & duration FF plans

R.G.O.A Poles

936 Hamal Dr., Littleton, CO 80124
Owner: Rick Pangell
21ft. telescoping fiberglass poles

Ross' Books

38 Churchill Rd., Cresskill, NJ 07626
Owner: Don Ross
Excellent book on building &
flying rubber powered planes

Scale Flight Co.

1219 So. Washington St.
Bloomington, TN 47401
Comet/Megow 10 cents plans and kits

Scale Model Research

2334 Ticonderoga,
Costa Mesa, CA 92626
Owner: Bob Banka
Scale documentation pix and 3-views;
cat \$3.00

Schlosser Assoc.

Box 412, Ridgefield, NJ 07657
Owner: Edward Schlosser
Some indoor supplies;
Oldtimer rubber

Slusarczyk Plans

4200 Royalton Rd.,
Brecksville, OH 44141
Owner: Chuck Slusarczyk
No-cal, pennyplane plans; S.A.S.E.

Wilder's Machine Works

2010 Boston, Irving, TX 75061
Owner: Bob Wilder
Fine quality winders and
torque meters

Jim Jones on Tail Booms

One of the hardest tasks in building a straight tapered tail boom is in keeping the glue seam straight. The joint adds to the strength in flexing, so if the glue joint ends up straight then the tapered tube will not want to bend up and down as easily as it will sideways. Since the forces on a tail boom want to bend it upwards, then a nice straight glue joint opposite the major bending forces will be an asset. Two years ago out of desperation I tried the method in the sketch. On the first try I was amazed. The tube came out perfectly

straight and the glue seam came out perfectly straight, but it looked horrible when compared it to the nice straight tapered tubes that everyone else has at the contests. After I glued it together I was able to forgive the looks of it. The wood compressed under the rubber was stronger than the wood elsewhere. After glueing it together it would not flex as easily, in any direction. It reminded me of the cardboard tubes that the rug manufactures use to hold rolls of carpet. This has not been tried on a straight tube, but that will be next. They look horrible but are really strong, without added weight.

CAN-FORMED PROP BLADES

bob meuser

FROM NFFS SYMPO '73 ALL YOU
NEED TO KNOW ABOUT
INTRODUCTION "CAN" PROPS. - PJB

While carving props for rubber-power models may be character building, many prefer the simpler method of steaming sheet-balsa blades over a form. The form may be simply a tin can, or other cylindrical object. By selecting the right size can, and by laying the blade blank at the proper angle on the can, one can achieve a remarkably good approximation to a uniform-pitch prop, and one can obtain any desired pitch and camber.

One can certainly select the can size and helix angle by trial and error methods, and certainly dozens of perfectly satisfactory props have been made that way. I think the job is much easier, and the results more certain, when the graphs presented in this paper are used.

Max Chernoff presented an analysis of cylindrical props in the 1964-65 Model Aeronautic Year Book* for props having blades that extend to the propshaft. This paper extends that analysis to the more general case where the blades start at some distance from the propshaft and are supported on "arms," or extensions of the hub.

There are three problems to be considered: a) Selecting the twist rate to give a good approximation to a uniform-pitch blade; b) Selecting the can size and helix angle to give the desired twist rate and the desired camber at the same time; c) Setting the blades on the hub at the correct angle.

* All of the mathematical development is tucked away in the appendix where it will do no harm. I will not be offended if you skip the rest of this and jump directly to the "Example." If you follow through the method to your own prop will be a cinch.

DETERMINING THE TWIST RATE

I'll refer to a prop having blades that are bent around a can as a "cylindrical prop;" seems more dignified than talking about tin cans. The blades of such a prop twist at a uniform rate — so many degrees per inch. Figure 1 shows how blade angle varies along the blade; a cylindrical prop is represented by a straight line, while a uniform-pitch prop is represented by a curved line. On all modern indoor props, and on many outdoor props too, the inner parts of the blades are replaced by extensions of the prop hub; the blade starts some 20 to 30% of the way from the shaft to the tip. To minimize the blade-angle error — the difference in blade angle between the cylindrical and uniform pitch prop — we make the errors at the inner end of the blade, the blade tip, and a point near the middle of the blade equal. Note that

the tip and hub ends are washed out, while the middle part is washed in.

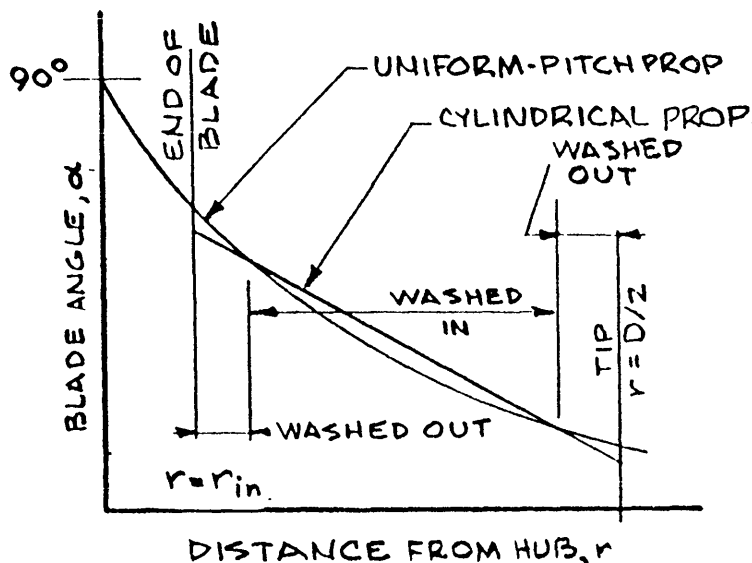


Figure 1: Variation of Blade Angle with Radius

Figure 2 has been constructed for props having blades that start at 20% and 30% of the distance from the shaft to the tip; designated " $r_{in}/\frac{1}{2}D = 0.2$ " and " $r_{in}/\frac{1}{2}D = .3$ ", respectively, on the graphs. The lower part of Figure 2 shows the twist rate that results in minimum blade-angle

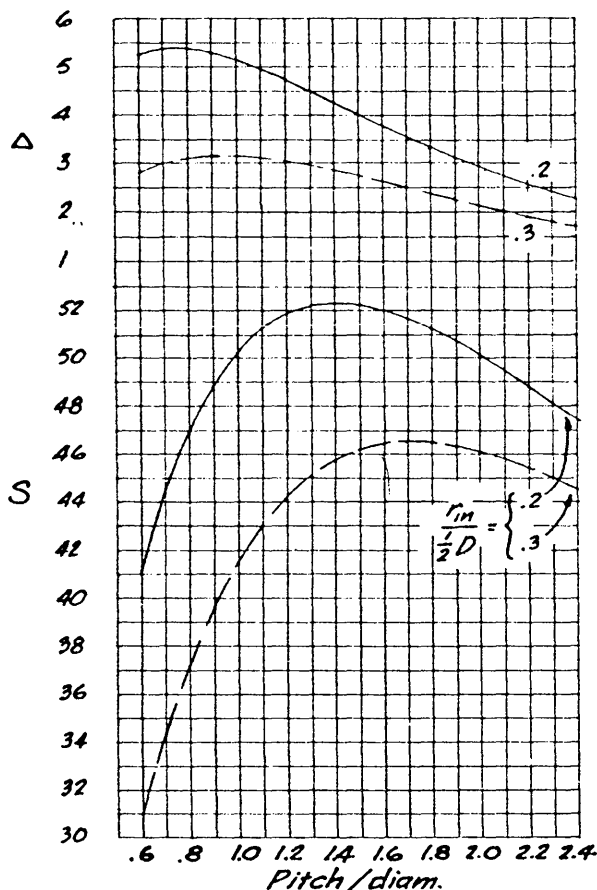


Figure 2: Twist Rate

* NOT REPRINTED HERE
REFER TO SYMPO 1973

CONTINUED FROM PAGE 18

error for various pitch-diameter ratios. The twist rate, S , represents the total twist that would occur if the blade extended clear to the shaft — merely a convenience. The top part of the graph shows the corresponding blade-angle error, Δ . Note that for a blade that starts 30% of the way out, the maximum angle error is only about 3 degrees.

SELECTING THE CAN SIZE AND HELIX ANGLE

Having selected the twist rate, we must choose a can that gives that twist rate and, at the same time, the desired camber. The blade width enters into the problem too. We express the camber in terms of the ratio of the height of the arch of the bottom of the blade to the chord; h/c . We express the blade width as a fraction of the prop diameter, c/D . The parameter "F" is simply the ratio of the two ratios; $(h/c)/(c/D)$. Along the bottom of Figure 3 the twist rate S is shown. Three sets of curves are shown; each line in each set is for a particular value of F . The lower set of curves gives the ratio of the can diameter to the prop diameter; $2R/D$. The middle set gives the helix angle; the angle at which the blade blank is laid along the can, which we call ϕ . The upper set of curves expresses the amount of "hook" or "arch" in the blades; we needn't be too concerned about that, but props having a value of H/D greater than about 0.015 look a little grotesque.

SETTING THE BLADES AT THE PROPER ANGLE

This is a cinch for anyone that has built props before.

Figure 4 shows the blade angle at a point 80% of the distance from the shaft to the tip.

AN EXAMPLE

Designing your own cylindrical prop will be easy if you follow this example for a Pennyplane prop.

Prop diameter, $D = 17$ in.

Pitch, $P = 25$ in.

Blade chord, $c = 2$ in.

Camber ratio, $h/c = 0.11$ (11%)

$P/D = 25/17 = 1.47$

$c/D = 2/17 = 0.118$

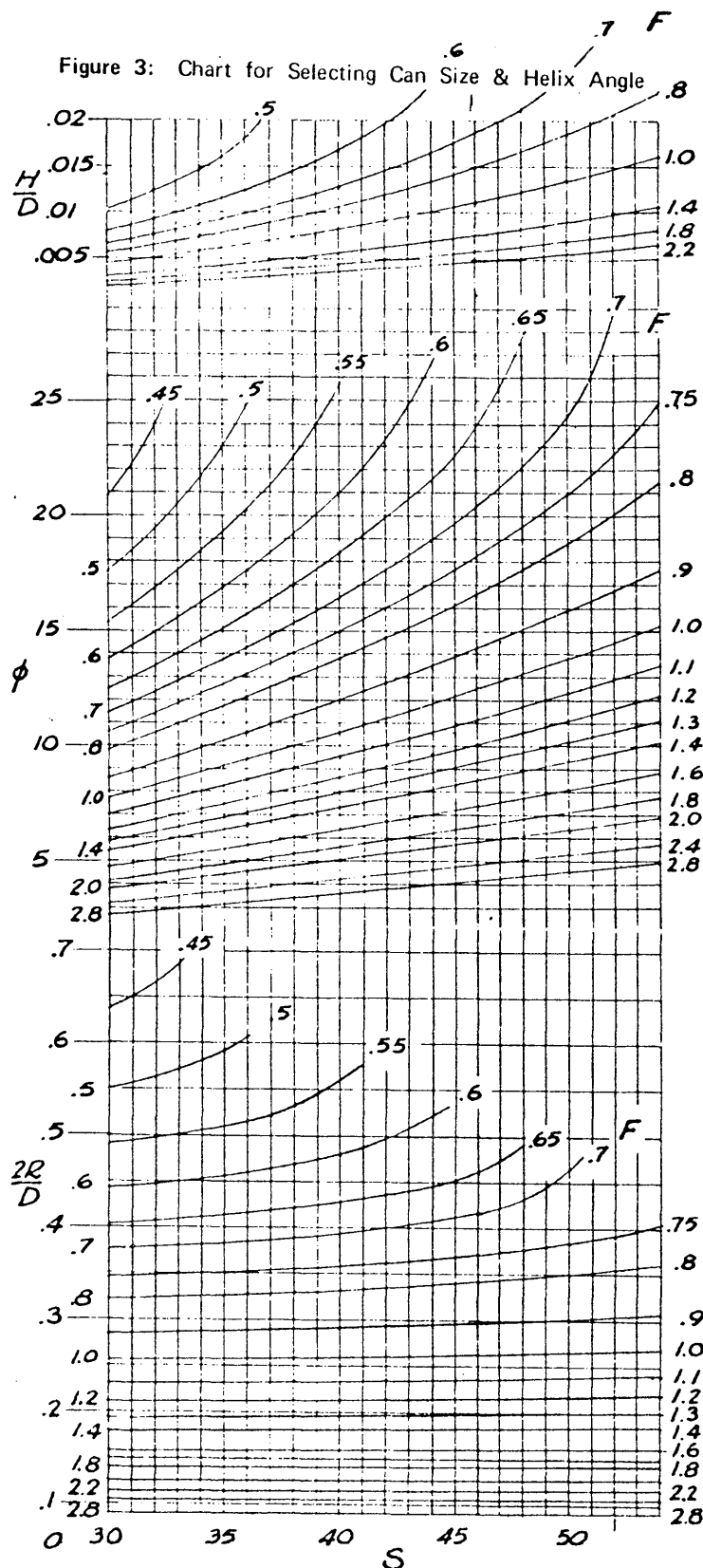
$F = (h/c)/(c/D) = 0.11/0.118 = 0.93$, say 0.9

We'll use a blade that starts 30% of the way out from the shaft to the tip; $r_{in}/\frac{1}{2}D = 0.3$. For that value and for $P/D = 1.47$, from Figure 2 we obtain $S = 46.1$ degrees.

With the value of S and a value of F of 0.9, we enter Figure 3 and obtain $2R/D = 0.297$ and a helix angle $\phi = 14.2$ degrees. The can diameter, then, should have a diameter, $2R$, of $2R/D \times D$ or $0.297 \times 17 = 5$ inches, which by a curious coincidence happens to be the diameter of a large coffee can.

And by another curious coincidence, this prop is awfully similar to the one used on the Pennyplane which Clarence Mather flew for 13 min. 35 sec. (Model Builder, Dec. 72), the best time achieved with a Pennyplane to date.

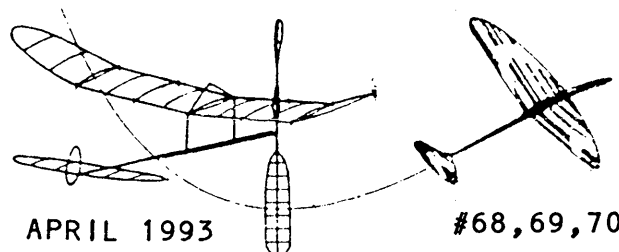
The can size is not terribly critical. If you have a can that is within 10% of the right size, go ahead and use



it — the blade angle error will increase by a degree, but that probably has little effect on the performance. If your favorite can is more than 10% different from the correct diameter, you can change the camber or the pitch or both until you zero in on the can you have.

INDOOR

NEWS and VIEWS



EDITOR: PLENNY J BATES, 2505 WHITE EAGLE TRL SE, CEDAR RAPIDS IA 52403. PHONE 319-362-2969
FAX 319-364-7819

ATTEND U S INDOOR CHAMPIONSHIPS/NATS
JOHNSON CITY TN JUNE 3,4,5,6 See page 6

INAV APPROVED BY



† † Name
deleted. Wants
no part of this
now it is done

NEW HONOR FOR INAV

Indoor News And Views has a three star rating. Under the leadership of Professor Lester Garber it is hoped that the rating will jump to an unprecedented four stars.

The President's Council On Indoor Flying was convened by President Tony Italliano in late 1992. P † † was appointed Chief of the PCOIF. It is hoped that the new president Robert Waterman will see fit to support the PCOIF and will reappoint † †. Eat your heart out Arnold (Pump Me Up) Swartzeinagler (or whatever). Our thanks to Lin Reichel and the FAC for the idea.

THE JOY OF FLYING FREE

This video that has been several years in the making is now done. These are not home movies. This has been a NFFS project and has been professionally produced. About 35% of the tape is indoor. Be the first on your block to show the wonders of FF to your friends. Order from:

Tony Italliano
1655 Revere DR
Brookfield WI 53005



Special price if you mention INAV- \$25.00 plus \$3.00 postage.

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A TIP OF THE HAT

TO THOSE WHO MADE INAV HAPPEN

Some of the names will not be familiar to Indoor modelers because they worked behind the scenes doing things like helping your editor with his computer. Without their help and the help of the others on this list the past year and a half of INAV would not have been.

SEE PAGE 2

THOSE WHO MADE INAV HAPPEN

YOU for supporting your editor and INAV with your subscription.

* Deceased

Colleen S Bates
Frank Kleser *
Burr Stanton *
Millard Wells
Tom Winter
All at MAX-FAX
Roy Bourke
Hidetoshi Horikiri
Anyone I Missed
Thedo Andre
Thedo Andre
David Aronstein
Paul & Mary Avery
Al Backstrom
Cezar Banks
Laurie Barr
Hardy Brodersen
Ben Byers, Jr.
Donald Campbell
John A Carter
Bob Champine
Stan Chilton
Nathan Chronister
Jim Clem
Bob Clemens
Lawrence D. Coslick
Clifford Culpepper Jr.
Otto Curth
Dan Dias
Melody & Richard Dolg
Dr. Walter C. Erbach
Boyd Felstead
Tobias Feuer
Stan Fink
Ronald Ganzer
Lester Garber
Harry G Geyer
Lew Giffow Tom Green
Vernon D. Hacker, M.D.
Michael & Toshiko D Han
William & Joan Hannan
Ray Harlan
Richard Hawes
Howard W Henderson
Thomas Hultgren
Tom Iacobellis
Tony Italiano
Ken Johnson
Ernst Johnson
Jim Jones
Bob Kilpp
Harvey Pastel
Ralph Knight
Jack Koehlar
Larry Kruse
Ed Kuramoto
Gordon S. Light
Donald J Lindley
Dave Linstrum
Donald Mace
John Marett

All who helped promote INAV

Dr John Martin JR
Chris Matsuno
Pat McDonald
Paul McIlrath
Richard S McLellon
Robert B. Meuser
James Miller
Richard J Miller
Fritz Mueller
Harry Murphy
Shigeoyoshi Noaka
Dan O'Grady
Roy O'Mara
Robert Oppegard
Andy Page Harvey Pastel
Jerry Paisley
W. Hewitt Phillips
Jon G Putnam
Emanuel Radoff
Bob Randolph
Fred H Rash
Dr Andras REE
Dave Rees
Lin Reichel
Bud Romak
Roger Schroeder
Edgar W Seay
Jesse Shepherd, Jr
SIG Mfg. Co.
Wally Simmers
Gerald Skrajanc
Chuck Slusarczyk
Gene Smith, M.D.
Charlie Sotlich
Bob Stalick
Alice Stanton
Dennis Sutherland
Andrew Tagliafico
Bud Tenny
Jack Textor
Wayne Trivlin
Gary Underwood
Tom Vallee
Abram Van Dover
Walter Van Gorder
Earl VanGorder
John Voorhees
Lou Ward Tom Winter
Bill Warner
Robert Waterman
Chris Weinreich
Fred Young
NFFS and all those who
make it go
Flying Models magazine



ALL F.F. N.L. Editors

+++++

Any given propeller does the best it can.

Phil Hartman

June 3, 1992

+++++

NEW TOOLS

Two new tools are available through Dr. Vern Hacker. Both are laproscopic surgical instruments manufactured by Symbiosis Corp. of Miami FL. One is a gripper (gripper 1/2" long) and the other is a scissors (cutting edge 5/16" long). Both tools at the end of 12 inch long 3/16 dia. shafts are controlled by a scissors like hand grip that is offset to give you a clear view to the tool. Dr. Hacker still has the micro cautery and three varied small knives (eye scalpels) available as a set.

Both laproscope tools \$20.00 postpaid.

One laproscope tool \$10.00 postpaid.

Get both, at your friendly neighborhood body cutting place the set is about \$300.00.

Cautery / scalpels set \$10.00 postpaid.

From: Vernon D. Hacker
25599 Breckenridge Drive
Euclid OH 44117-1807

Kevin Smith and Charles Slater of Symbiosis have donated the instruments and the proceeds will go to the A.M.A. junior free flight program. Last year the program generated \$3240.00 for the indoor team travel fund.

Caution: DO NOT use these tools for their intended purpose at home. Leave that up to the trained body cutters at your local body cutting place.

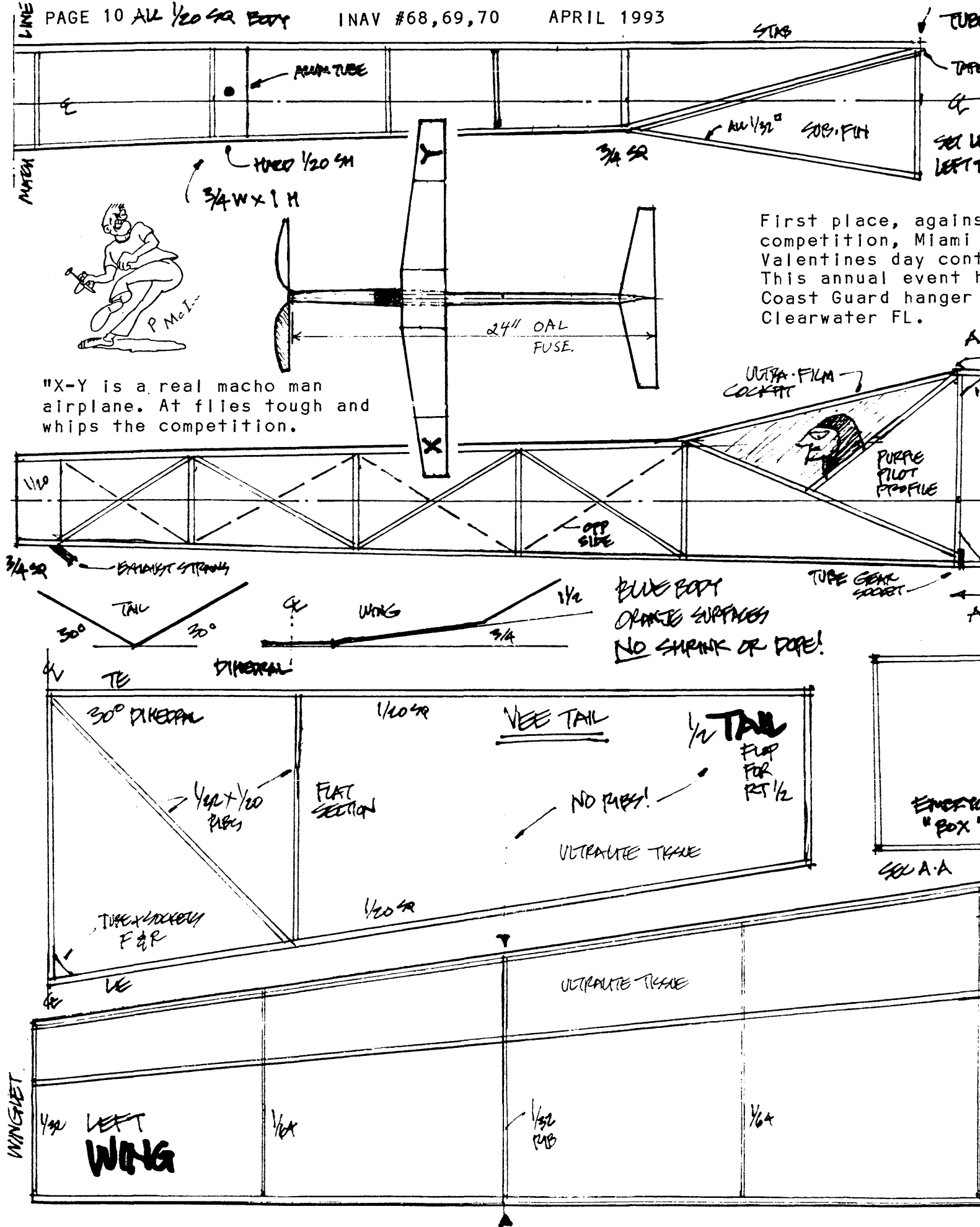
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BUILDING BOARD

Harvey Pastel M.D. suggests map pins (short with ball head) from the stationary store are better than "T" pins. He uses an old-fashioned pin cushion to hold the pins rather than a box. Your editor likes Plastic Head Pins (SIG size No.20). They work well with Rocket City Pin Clamps (SIG RK-55 pack of 28 \$1.25). They are a collar that fit to the pin and provide a "hold down." Friction on the pin may be altered by cutting the pin clamp to make it sort of a split ring. Instructions are with the pin clamps.

Harvey also reports good results using an iron or steel (not stainless) work board. He draws a one inch grid on it as an aid in lining up fuselages and flying surfaces. He flattens out his plans and waxed paper and holds the balsa parts with magnets. Hardware stores have rolls of magnetic material (about 1/16 inch thick) that can be cut into three inch lengths. Better ceramic high energy magnets are available from Cherry Tree Toys Inc., P.O. Box 369, Belmont OH 43718. For catalog send \$1.00. Their magnets are about 3/16 inch thick. Harvey says the catalog is fun with a lot of things that will interest the indoor builder.

There is always a better way of doing it. YOU, yes YOU, put pen to paper, contribute and get famous.



EX 304ST TAIL - ADJUSTABLE @ TE

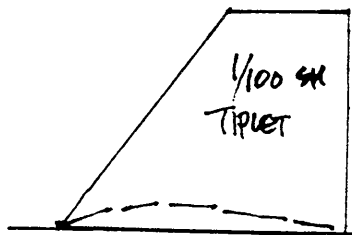
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APRIL 1993

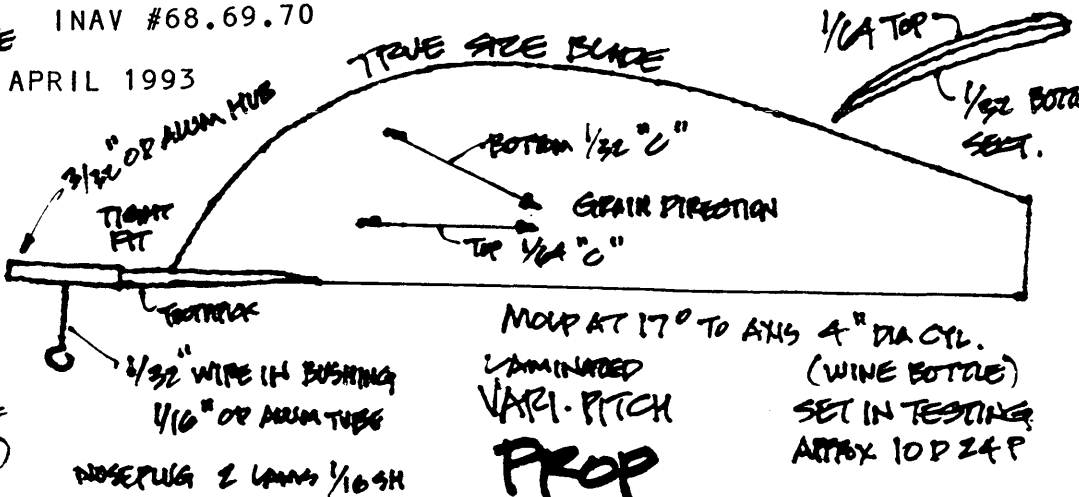
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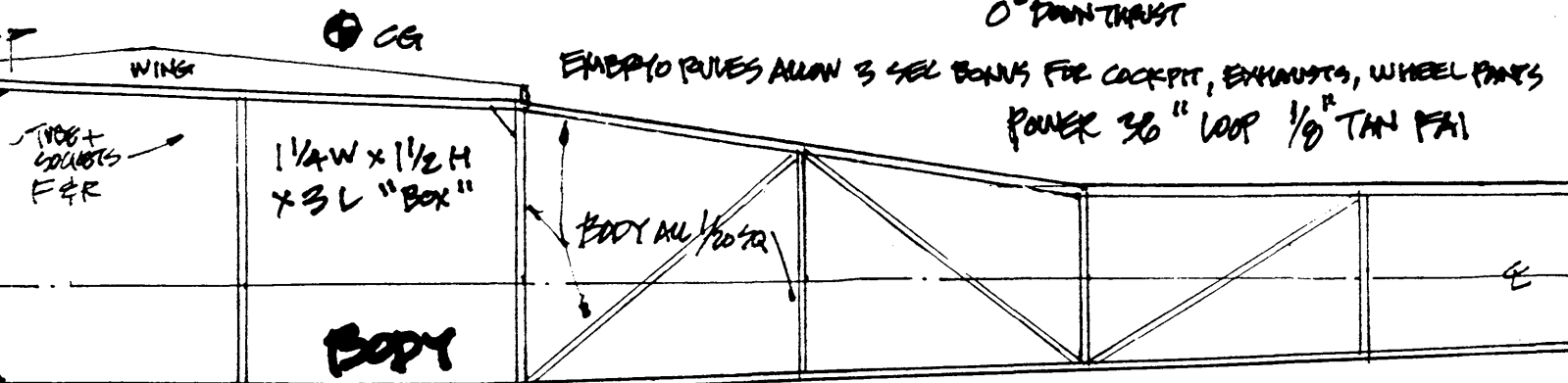
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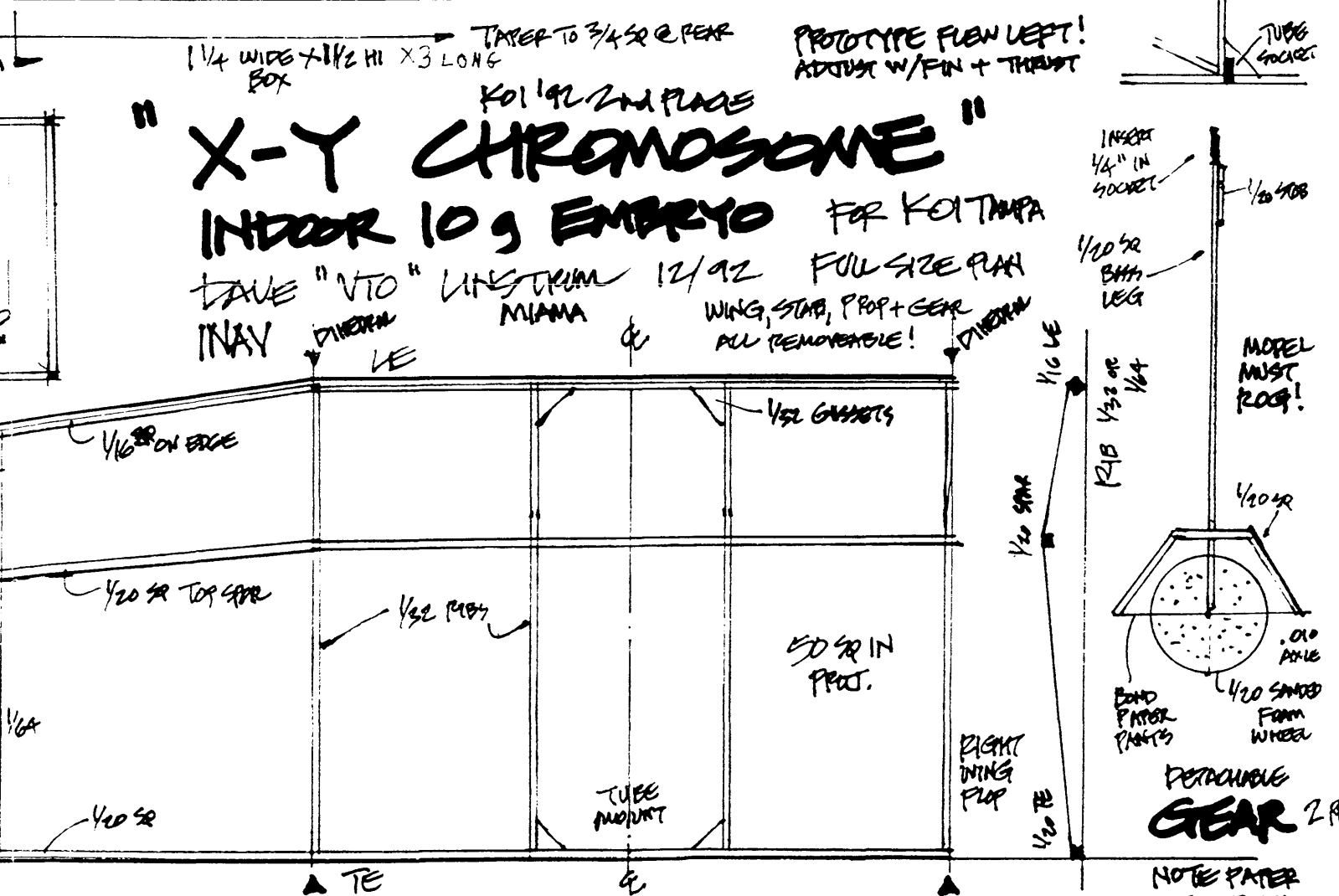
WINGLET
(OPTIONAL - TURN OFF
BY MESH @ PETA)



MOLD AT 17° TO AXIS 4" DIA CYL.
(WINE BOTTLE)
SET IN TESTING
APPROX 10 D 24 P
PROP
0° DOWN THRUST



EMBRIO RULES ALLOW 3 SEL BONDS FOR COCKPIT, EXHAUSTS, WHEEL PARTS
POWER 36\"/>

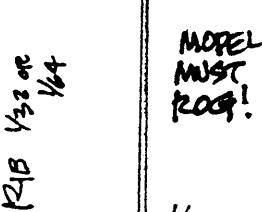
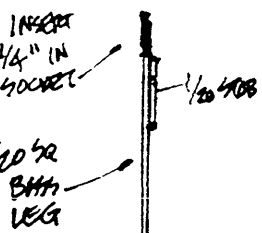


"X-Y CHROMOSOME"

INDOOR 10g EMBRYO

TAKE "VTO" LIFESTREAM 12/92 FULL SIZE PLAN
INAV DIRECTIONAL MIAMA & WING, STAB, PROP + GEAR ALL REMOVABLE! DIRECTIONAL

PROTOTYPE FLEW LEFT!
ADJUST W/FIN + THRUST



DETACHABLE
GEAR 2 Pcs

NOTE PAPER
WHEEL PARTS

USIC / NATS JUNE 3, 4, 5, 6 JOHNSON CITY TN

DORM ROOMS WILL BE AVAILABLE
HOTEL RATES REASONABLE BUT
SHORT SUPPLY - RESERVE EARLY

An auto racing event in the area may cause a shortage of hotel / motel rooms. The Garden Plaza Hotel has set aside a block of rooms for USIC people. The rate is \$55.00 (a great buy - these are nice rooms in a first class hotel) but they cannot be held forever with the pressure that is almost sure to come from the auto race people. If you wish to stay in the Garden Plaza call direct 615-929-2000 and ask for the special USIC rate. If there is any problem ask for Amber. She set this up.

There is really only one thing to say about the USIC / Nats

GO

Good Indoor sites usually don't last. West Baden '83 was my first indoor contest. It was wonderful. It was not a fine resort, those days were fifty years earlier but it had something for the indoor flyer that was beyond definition. And even though my models would hardly fly I got to be a part of a wonderful experience. It is gone, and that is the point. We got lucky, Johnson City has a world class site, don't miss it. We may be in Johnson City for many years but things change and the site could be lost. Be in the "Dome" this year.

If the material from Tom Iacobellis gets here in time you will find entry materials and full contest information with this issue of INAV. If not send Tom a SASE (business size) and request the material.

TOM IACOBELLIS
USIC MANAGER
198 MANHATTAN AVE
HAWTHORNE NY 10532

WHOLE LOT ABOUT HOLES

from: Otto Curth, Chicago Aeronut

I make small drills .010 and up out of music wire. Heat red hot and bash on a piece of steel. Then grind like a spade drill, solder into brass tubing to be able to chuck (See figs. 1 and 2). after drilling hole burnish hole with a steel pin, (See fig. 3) file and lap face of bearing.

fig. 1



fig. 2

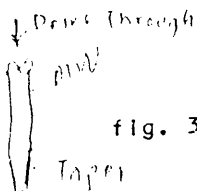
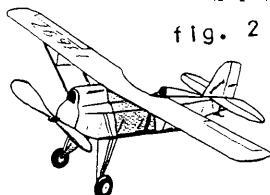


fig. 3

rough or
pre-drilled hole,
Place pin through
hole in metal plate.

IMPORTANT RE: USIC/NATS

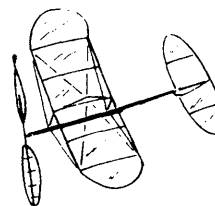


COVERING TIP

From letter to Doc. Martin from Mike Arak. INAV will seldom have material from the Hanger Pilot because most modelers who are active subscribe to the H.P. Mike suggested that in memory of Butch Hadland modelers who knew him should pass on his building tips as a fitting memorial. He continued:

"For example, Butch's method of making wings and stabs with the right amount of wash-in or wash-out, (or flat without bowing). When he first described his method to me, I thought he was joking, as he occasionally did, as it was contrary to accepted practice. His method is simple: after the component is tissue covered, before it is doped, it is saturated (completely wetted) with water. Not the usually recommended "damp mist" or with alcohol, but really wet. Then it is pinned to a surface (building board, foam sheet, etc.) with balsa shims in the proper locations to create the twist. For a P-nut sized wing I use 1/8" square strips, longer than the cord of the wing, and lay them under the root and the tip ribs, and usually the center of the wing, and the shims on top of them. The wing is laid on top of this and held in place with angled pins. Let it dry overnight (or sometimes for days) use your favorite doping technique, and forget it."

"Butch explained that the water relieved the stresses in the leading and trailing edges, and spars, and they take a "set". I have used this technique on P-nut sized stabs, double covered, as well as wings. It makes the stab really flat, and permanently so."



NO SMOKING

Frank Zalc wrote to say he remembers climbing the girders of the New York Armory to recover models. This lead he and his brother John to develop a balloon retriever. Hydrogen was made with zinc strip and muriatic acid. For you kids muriatic acid is hydrochloric acid. Needless to say smoking or a stray spark could have been harmful to one's health.

MOVING ? SEND INAV YOUR NEW ADDRESS

FLAPPER FACTS

Send a SASE to : Nathan Chronister
3140 Rt. 209 # 2A
Kingston NY 12401

First issue is out and the effort is to make this a quarterly. The find hand of Roy White seems to be in this thing

Price: \$5.00 US
\$7.00 overseas US funds

ORIGIN OF INAV LOGO

By Dave "vto" Linstrum

Nearly thirty years ago, while a Landscape Architecture student at Kansas State University INAV editor Bud Tenny asked me to develop a distinctive logo / masthead for his newsletter. That it has lasted this long may be a tribute to the symbolism of the graphic design or perhaps the indoor flyers respect for tradition? or editorial inertia?

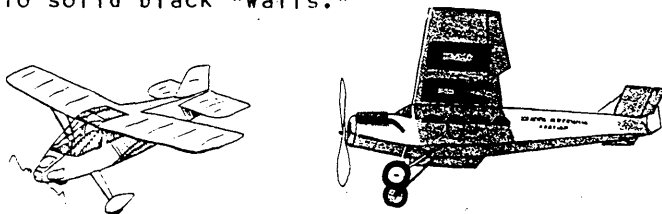
I chose the bold type face "Clarendon" and inclosed it in a dark rectangle halftone (now black) border to signify the walls of a building, which is common to our sport. Without buildings, we have no sites! In the early sixties, microfilm models and IHLG were the main types flown. I chose one of each to illustrate the activity to the literal minded. I do not recall if the mike job shown is a 90 cm FAI class or a AMA class C, but the swooping IHLG is most certainly a Lee Hines "Sweepette."

I would like to thank Bud Tenny for the opportunity to design the masthead art, and Walt Erbach, Charley Sotich and Doc Martin who have taught me about Indoor. I am fortunate to have such knowledgeable mentors and friends.

VTO

Still crazy (about Indoor)
After all these years

Editorial note: When the art work got to me it was a copy of a copy..... of a copy and needed a clean up. Jack Textor worked it up on his computer but the half tones he could develop did not reproduce well on my copier so I went to solid black "walls."



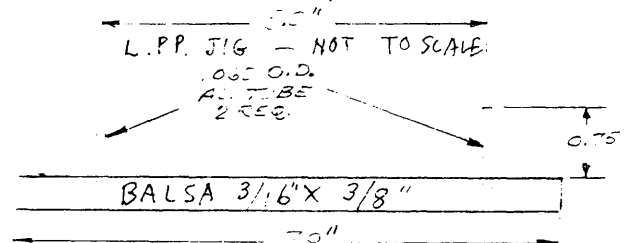
OFFICIAL WORLD RECORD

The FAI has approved Cat II record of 37:12 by Bob Randolph. Bob tells me he is building and testing some new V-P props that he hopes will be more suited for Cat III and IV.

TISSUE TUBES

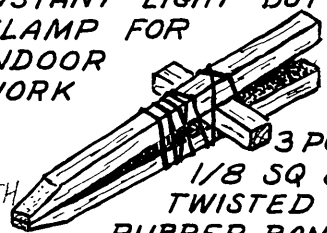
Tom Green as learned from Joe Krush

- (1) I use the shank end of drill bits for a mandrel. They are smooth, straight, and available in diameter increments of 1/64".
- (2) Prior to rolling the tube, coat the mandrel with Chap-Stick. This holds the tissue to the mandrel and also helps release the tube after rolling. Wet the tissue with your tongue before rolling.
- (3) With the tissue stuck to the mandrel, roll the mandrel one revolution so that the bare mandrel does not show and then apply thinned Duco and roll the tube. "As soon as the tissue end sticks down on its' own push the tube off using a thumbnail." When the tube has dried, coat with CA. This will stiffen the tube and prevent softening when the tube is mounted (or removed) on the motor stick.
- (4) I use a simple jig to mount wing tubes on the motor stick. The jig ensures that tubes are positioned accurately.



INSTANT LIGHT DUTY
CLAMP FOR
INDOOR
WORK

FROM:
PAUL
McILRATH



3 PCS
1/8 SQ &
TWISTED
RUBBER BAND

AVERY ON LIGHT BUILDING

For building Pistachio Paul Avery has a few suggestions. Pick a subject that has a low aspect ratio and a long fuselage. Stringers should be .037" balsa, no basswood compression loads just do not justify the weight. Hungertford wheels look great but are heavy, so turn them from balsa. Covering should be condenser paper. And last, using balsa make a pair of forceps (Paul says tweezers but in doctor school they told us to say "forceps") as shown in the drawing. His Huntington H-12 came in at 1.8 grams with nose ballast. Flights are over one minute. He is hoping for 1:20 to 1:30 with a Waterman Gosling.



INAV \$\$\$\$\$\$\$\$\$\$ CONDITION

Feel free to sign a friend up for INAV. The more some fixed costs, like photos, can be spread out the better. Might mention that INAV is in good shape. With the very high renewal rate INAV has enjoyed this past year there is plenty of money to meet subscription obligations.

LATEST ON U S INDOOR CHAMPIONSHIPS/NATS

As of now (March 7, 1993) the event schedule is not quite ready. Yet, because of the possible shortage of hotel rooms due to the auto race event it seems a good idea to get this out to you as soon as possible. The use of bulk mailing exacerbates the problem because some of you will not receive this for three weeks.

In short, by the time you get this the event schedule will be finalized and all of the entry materials will be ready. So do not let INAVs' lack of entry forms and lodging information keep you from going to the USIC/NATS for '93. Please note, there will be dormitory rooms available. The first year I went to Johnson City I used the dormitory facilities and they were fine. They were a bit spartan but clean and as I remember, air conditioned. The floor I was on was for couples so if you do need to stay in a dormitory do not let that discourage your wife from going. On the other hand if your wife thinks that "roughing it" is slow room service at the Ritz she might want to pass. Entry material will be ready long before you read this. For the full packet of contest entry information write or call:

TOM IACOBELLIS
198 MANHATTAN AVE
HAWTHORNE NY 10532

TELEPHONE: 914-592-5176 (daytime)

THE "I KNOW, I KNOW" DEPARTMENT:

Page 1 "deleted" has an "a" added.

Page 2 I forgot someone, don't know who, but I did.

Page 6 Text with fig.3 "drive through, music wire, taper, rough or drilled hole, place over drilled hole in metal plate." Just place the text where it will do the most good. Sorry, Otto.

Page 7 Text with jig drawing. ".062 O.D. al. tube 2 req." Sorry Joe.

Page 7 arms of the forceps are balsa 1/16 X 1/4 spacer 3/32.

Page 10 "At flies tough" should be "It flies tough"

Page 11 Sideways. Yes, it was that or type it again myself and you can see what a mess that could make of it. Bob is doing a great job with this series and we all should thank him for taking the time and expending the effort to do these pieces.

THE F1D CHALLENGE PART TWO BOB RANDOLPH

Set your own reasonable goals for certain model parts. Here are some of mine: I retire F1D Wings when they hit .012 oz. I won't use a stab frame if it exceeds .0027 oz. I won't use a cabane that exceeds .0006 oz. nor wing posts (2 plus Boron) that exceed .0014 oz.

When I was assigned in Cleveland from 1965-1968, my home was only 12 miles from Micro-X. I spent hours sorting through Jerry's 4000 sheet stock, weighing and measuring to find exactly what I needed. I will admit that I'm very picky about wood. Because of my standards, about 75% of what I mail order from both major suppliers, I do not use. However, I never send back any wood.

For several years now I have been building mostly from my "reject" stockpile, so Jerry thinks I buy from Gitlow, and Lou thinks I buy from Jerry.

The secret of my success really is no secret. I love to fly indoor and year after year make between 500-800 flights. I doubt if anyone does more. I know the constant practice flying, adjusting, and steering helps. The word "practice" makes me smile and I'll explain why. Last year an old friend from my Cleveland days was vacationing in California and looked me up. Since I was all packed up and actually enroute to my flying site, I invited him and his wife and two kids to my practice site. After 2 or 3 flights his 5 year old son said he didn't see why I had to practice since I knew how to fly. The kid was right and perhaps we should call these "test sessions".

I don't know about you, but I find it difficult to maintain a high level of indoor enthusiasm if I don't fly frequently. I suggest you look over every gym in your area and try to get the best on a regular basis. I should point out that stable air and a non-catchy ceiling are way more important than a high ceiling. Teachers and principals are usually fascinated at the lightness and technology that goes into an F1D. I got my site by accepting complete responsibility for my "assistants" and being meticulous about cleanliness. I locking up, and resetting the school alarm system. I frequently hold talks and flight demonstrations for classes. School officials know that I'm very serious in my efforts to advance the state of the art and are pleased to hear of my accomplishments. Last October I was lucky enough to take the new principal up in a club sailplane on an excellent thermal day for a 3 hour flight, topping Mt. San Jacinto (next to Palm Springs). I've never seen anyone enjoy a flight more. The point I'm trying to make is that you have to work at getting and keeping a good flying site.

My next article will probably cover test flying and the use of partial test motors to find the optimum motor. If you can't wait, you might look up my article in the September 1991 issue of Model Aviation. Since you will need an F1D to test fly, start building and good luck.

THE F1D CHALLENGE

Lt. Col. Bob Randolph

Getting Started in F1D

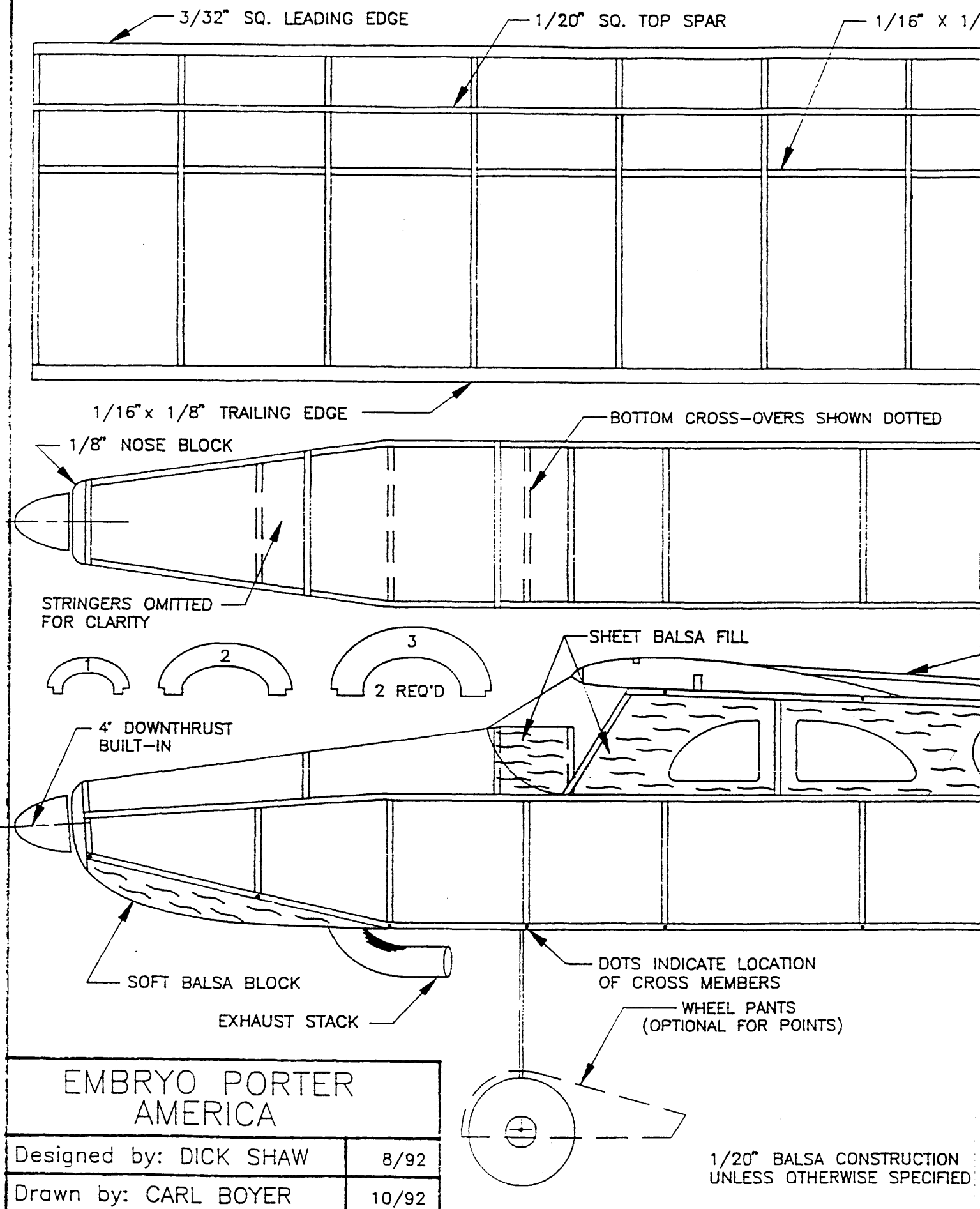
I have assumed that my direct and logical appeal in the previous issue was successful and some have decided to try F1D. My suggestions will not only get you started but are intended to guide the novice to progress rapidly by doing it "my way".

I was prepared to start out with a discourse on the importance of wood selection. Suddenly the idea hit me that what makes F1D so great is that everything is important. You need a good design, a well built model, a well adjusted motor, good rubber, and capability to find the optimum motor to obtain really long flights. Any one factor that doesn't measure up will reduce duration. Therefore your goal should be to improve all of the skills required. Some may question what skill has to do with rubber. The skill is being able to identify which of the rubber you possess is best and to keep an active look out for better. For the 84 World Champs Stan Chilton furnished the US Team with three batches of Pirelli Rubber that was so superior that I would almost kill for more. Both of my World Records were set using good Dolby Tan.

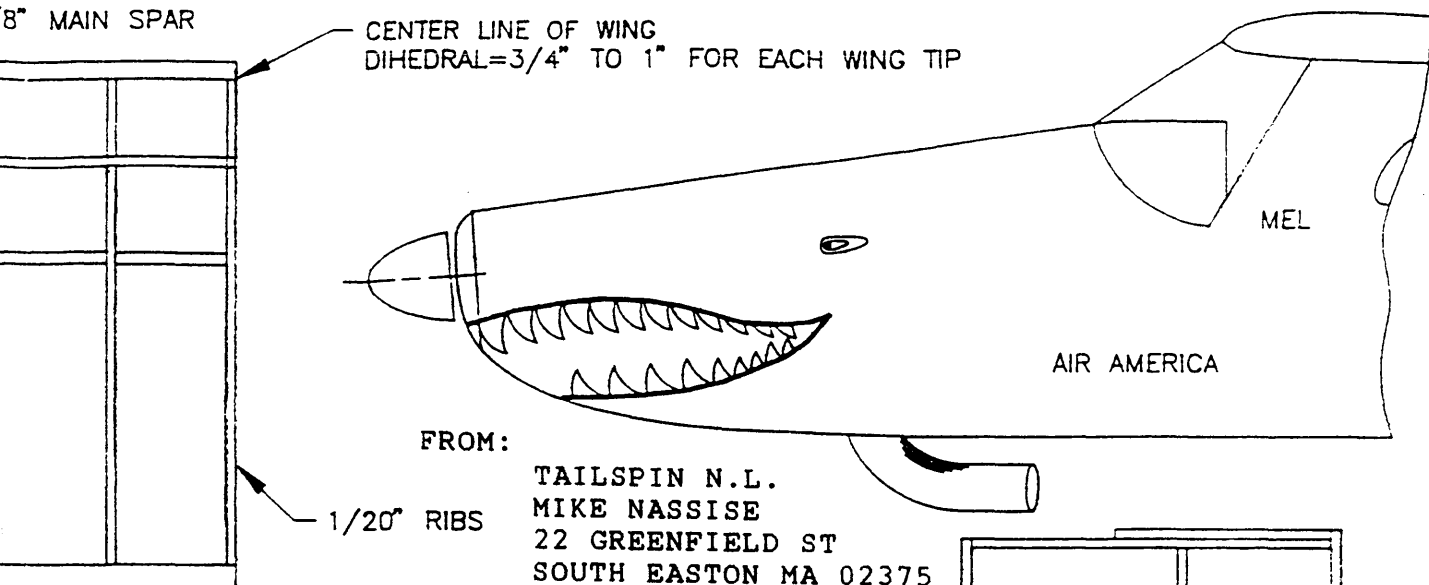
You can't improve your F1D craftsmanship without good tools. You must be able to obtain uniform readings of wood sizes and weights. I use two direct reading scales that I made. One is 0-5/100ths and one is 0-25/1000ths. I use a dial paper gauge that cost \$12.50 about 30 years ago. Also, you absolutely need the best rubber stripper available. I've tried them all and suggest the one made by Bob Oppegard (140 East Golden Lane, Circle Pines, Mn 55014).

I still use Ambroid thinned with Acetone. I don't have a set ratio but go by color and viscosity. I recall the advice from Bill Bigge to use only enough Ambroid that the wood fails before the glued joint after about two minutes. You must remember to keep adding Acetone to your glue gun because it will evaporate after a week or two.

I strongly recommend that your first F1D be a Proven superior design. This will not only save a lot of development time, but will allow you to expedite and concentrate on improving of your building and flying skills. One very common mistake is to try and hit the designers light weights with your first ship, resulting in a really weak model that won't last through a test flight program. It's better to make everything 25-30% heavier and then keep reducing the weight on your 2nd, 3rd, and 4th copy before you match weights. You must keep detailed records of all parts if you expect to progress.



8" MAIN SPAR

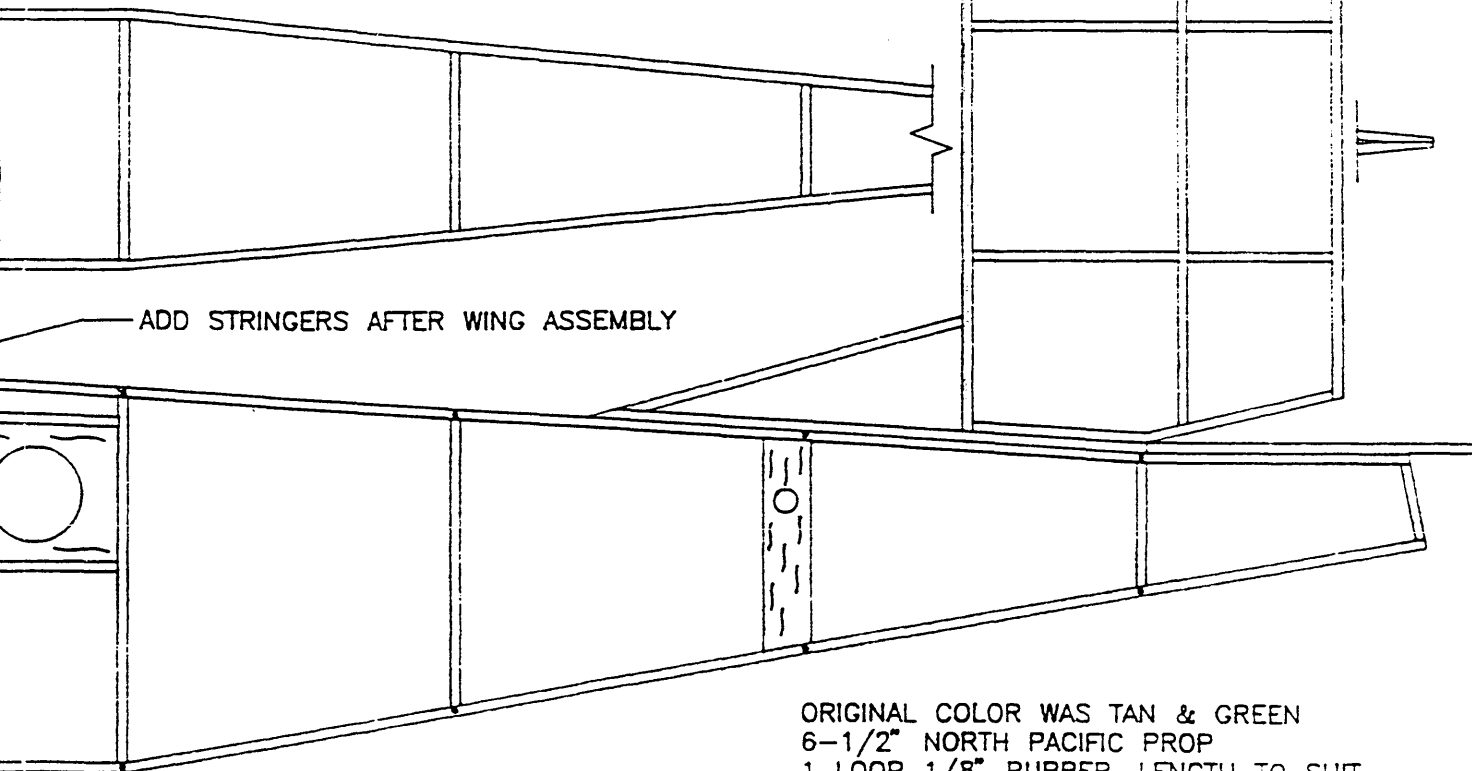
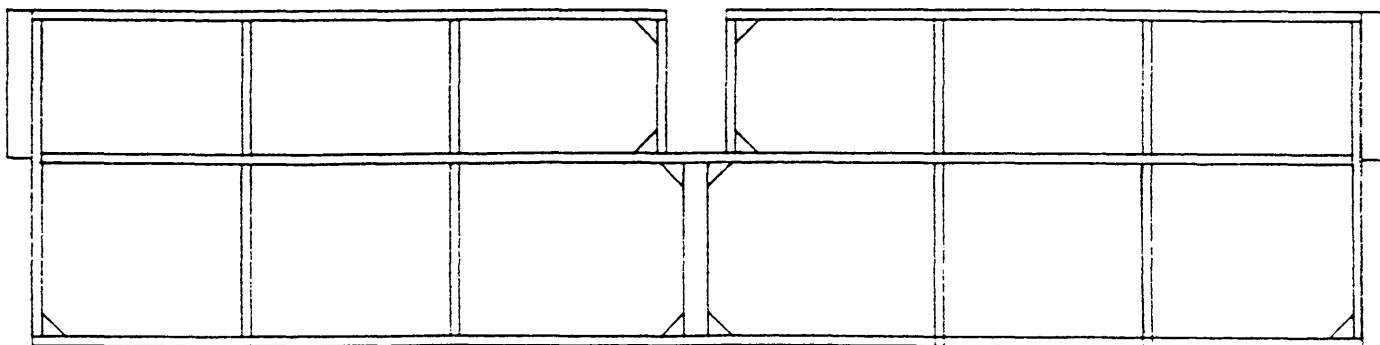
CENTER LINE OF WING
DIHEDRAL=3/4" TO 1" FOR EACH WING TIP

FROM:

TAILSPIN N.L.
MIKE NASSISE
22 GREENFIELD ST
SOUTH EASTON MA 02375

1/20" RIBS

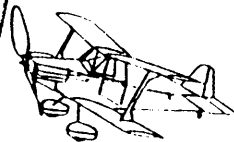
\$ 7.00 / YR (SIX ISSUES)

ORIGINAL COLOR WAS TAN & GREEN
6-1/2" NORTH PACIFIC PROP
1 LOOP 1/8" RUBBER, LENGTH TO SUIT

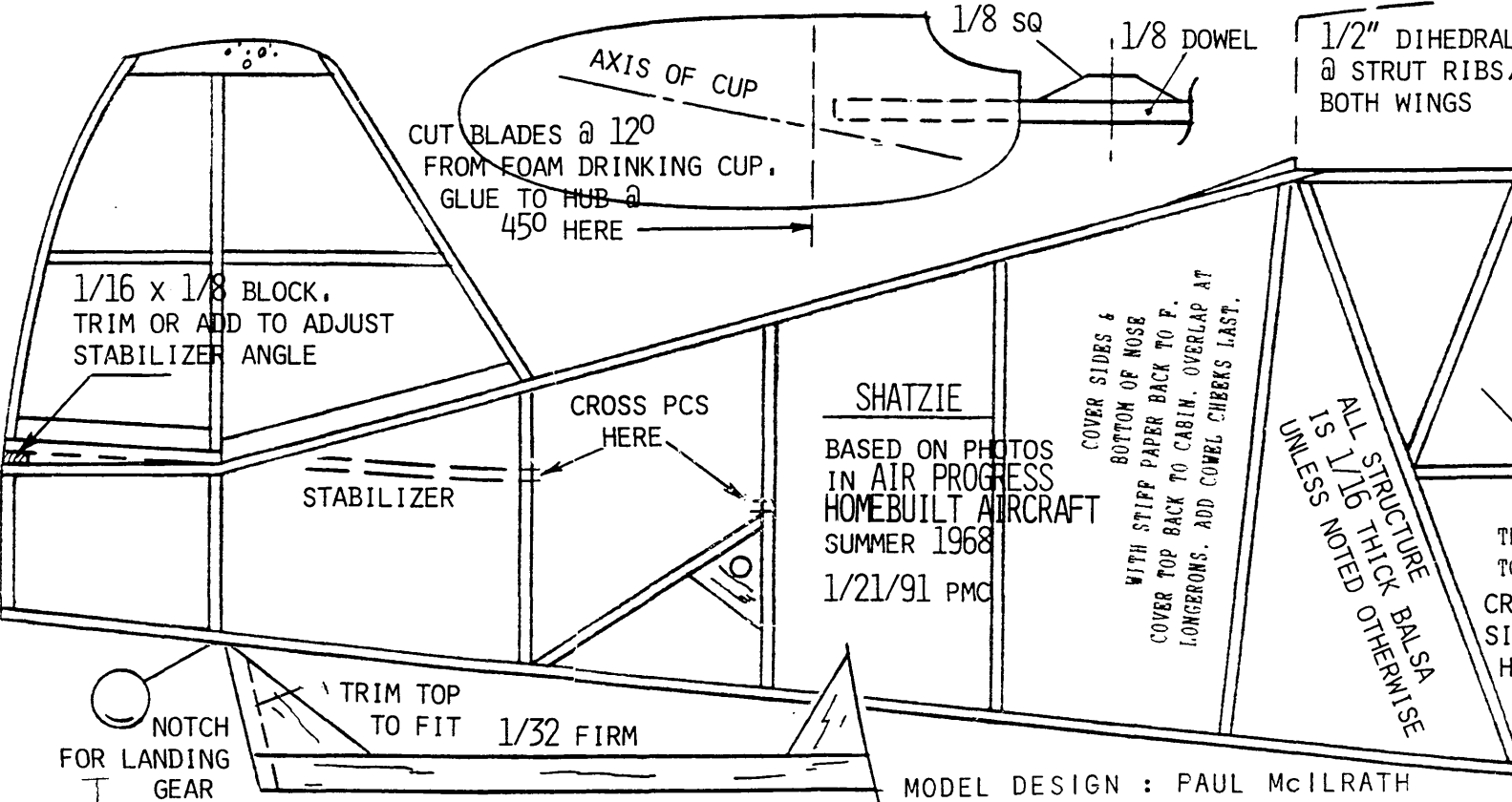
ALL WING AND TAIL TIPS
CAN BE SHAPED WITH THE
SAME TEMPLATE

INAV #68,69,70

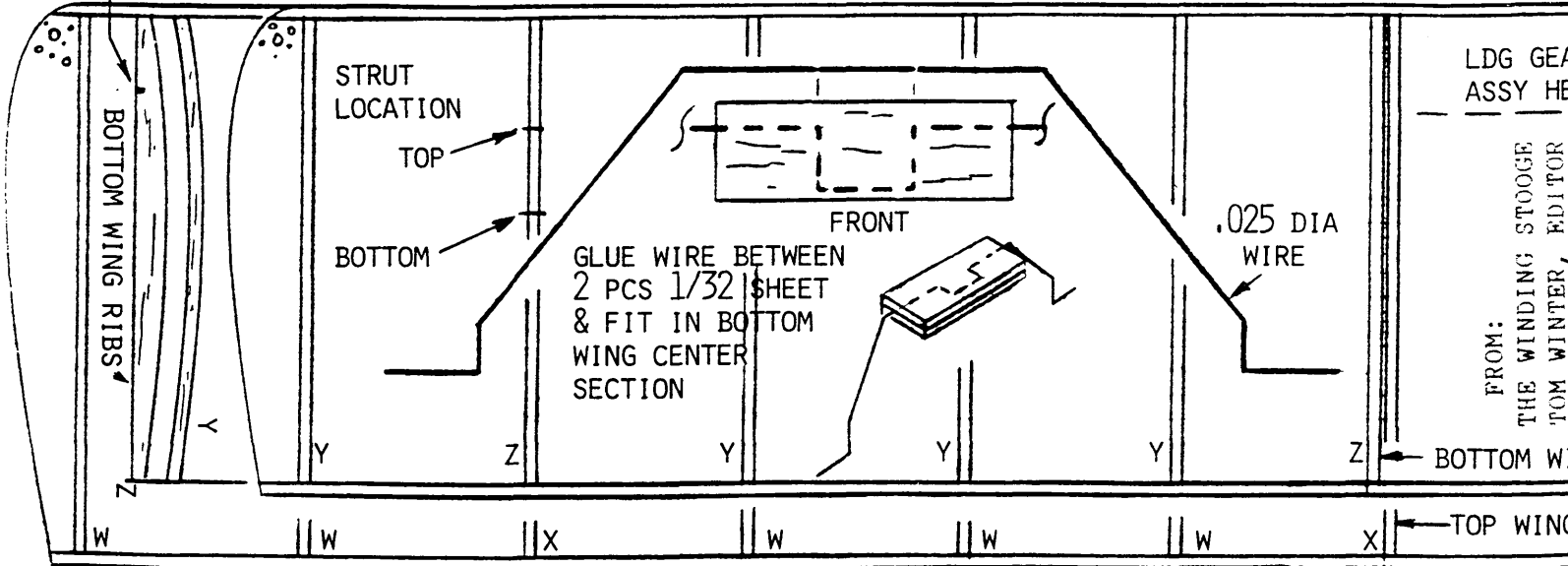
TRIM TO FIT FUSELAGE.
GLUE TO FUSELAGE
AFTER TEST FLIGHTS



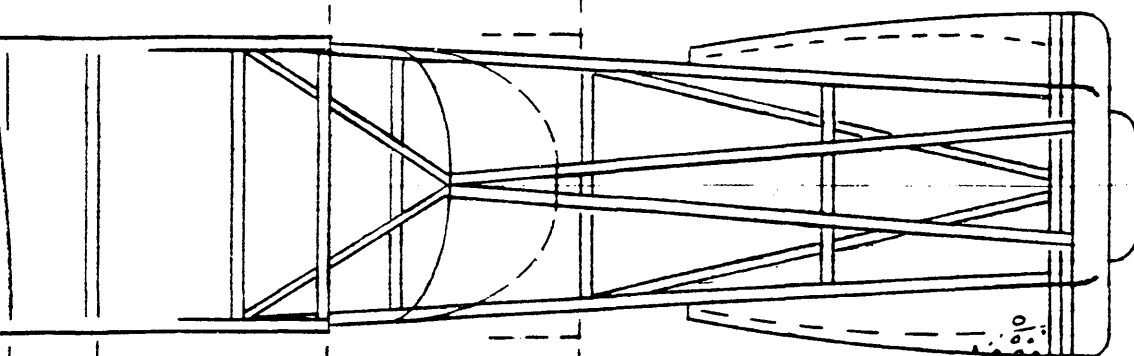
ALL TIPS
ARE 1/16 FOAM



MODEL DESIGN : PAUL McILRATH



COWL CHEEKS MADE FROM FOAM



FOAM PARTS WERE MADE FROM 2 LB
BLUE OR PINK INSULATING FOAM

PROTO WEIGHS 13 GM RTF WITH
14" LOOP 1/8 RUBBER, FLIES
ABOUT 1 MIN IN 28 FT CEILING.
24" OUTDOOR AND RC VERSIONS
ARE ALSO FLYING.

BALANCE

SMALL
DOWELS

DRILL FOR
60° DOWNTHRUST
(APPROX 1/32)



FROM:
THE WINDING STOOGES
FROM WINTER, EDITOR
BLACK
DES
ERE

AR
RE

PLAN DRAWN BY : PAUL McILRATH

STRUT
LOCATION

TOP
BOTT

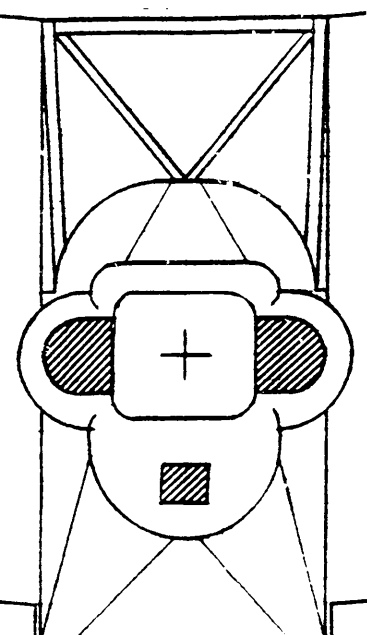
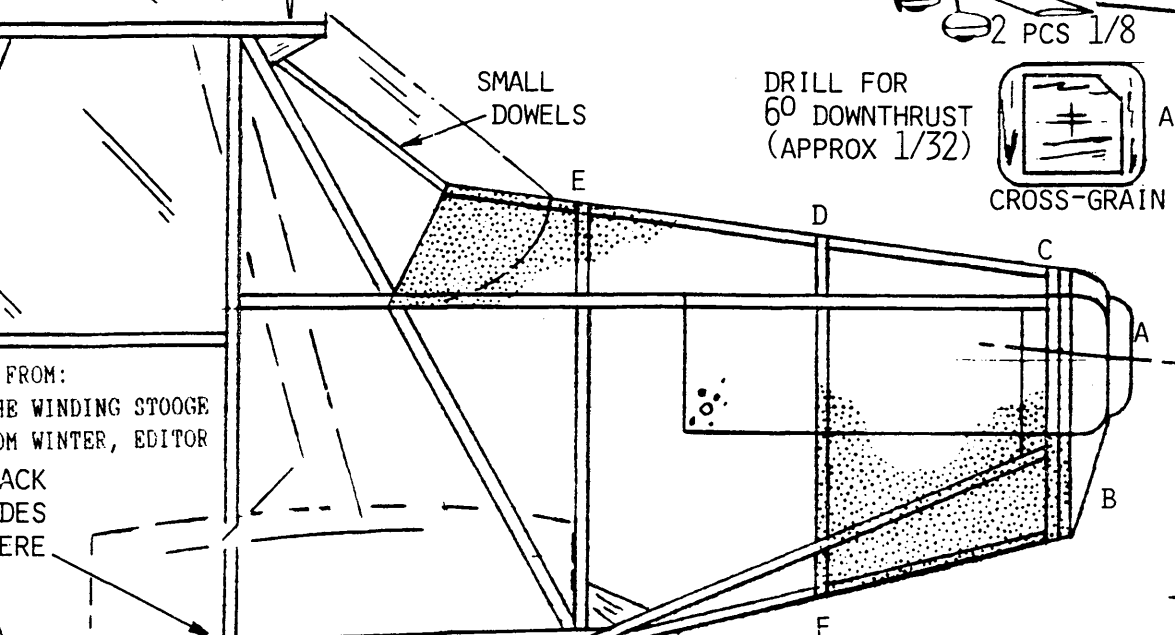
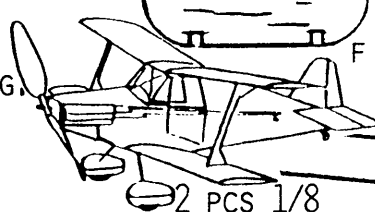
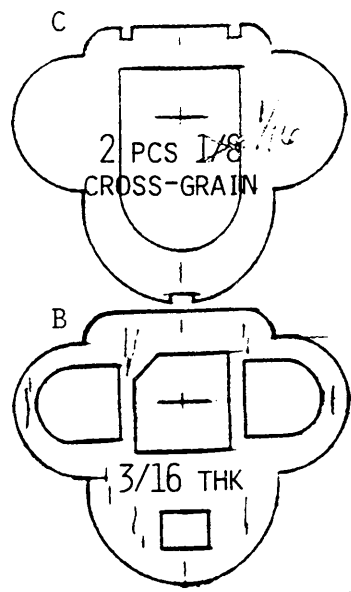
WHEELS & PANTS
ARE FOAM

RIBS FOR TOP WING

USE SAME TEMPLATE TO
CUT ALL RIBS

NG

G



ULTRA-FILM COVERING TIPS

ROGER SCHROEDER

I have recently completed a Pieces Easy B according to the 1992 design update by Earl Van Gorder and it provided an opportunity to improve my covering technique. In general, I try not to touch the micro-lite, but either handle it between sheets of newspaper or on a frame. In this respect, micro-lite is treated like micro-film.

To start a covering job, I lay down a flat sheet of newspaper that has been cut to a width about 1/16 to 1/8 in. wider than the roll of micro-lite film. The length is about 12 in. I unroll micro-lite on the paper trying to keep it straight and flat. Wrinkles can be smoothed by lightly blowing on the film, or as last resort, working the film with fingers.

As soon as the micro-lite is smoothed out, lay another similar sized sheet of newspaper on top of the film. Now the film is captive between the two sheets of newspaper. The film, and paper, can be cut to the length desired with a straight edge and razor blade. It can be picked up and carried around without worry.

I use a simple frame for covering which is illustrated in the drawing. It is made from a sheet of hard 1/4 x 3 x 36 balsa. Cut the balsa sheet in half, square the ends and sand the long edges smooth. You end up with two similar sheets about 14 to 18 in. long. Drill two undersize 1/8 in. holes in a lower corner of each sheet (about where shown on the drawing). Cut two 1/8 dia. steel wires to a length of about 10 in. Slip the wires through the sheets as shown. I found that reinforcing around the holes helps. The wires need to be a snug fit so that the position of the sheets along the wires can be adjusted, but the sheets stay put when the frame is handled.

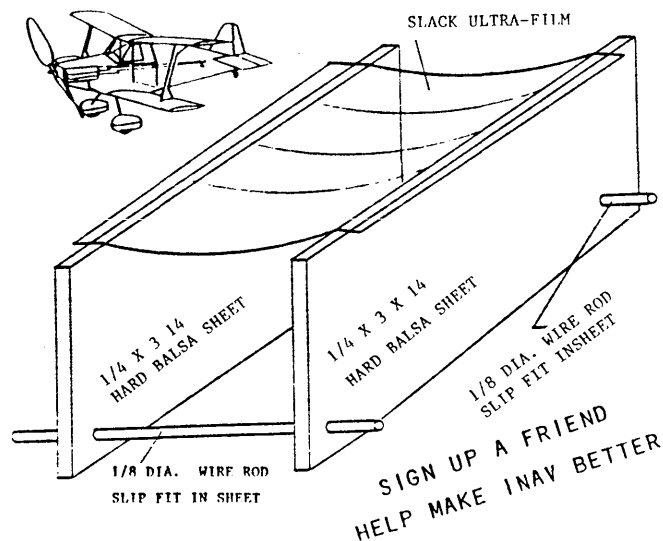
The film needs to be transferred to the frame. Adjust the wires of the frame so the frame width is about 1/2 in. less than the length of the cut film/newspaper laminate. 3M contact spray is the best for sticking film to the frame. Lightly spray the top edges of the frame, remove the top sheet of newspaper and invert the frame onto the exposed film. Press down to be sure the film is attached to the frame. Lift the frame. Some newspaper will stick, but can usually be peeled away easily. Set the frame down with the film up. Adjust the frame along the wires so the film is straight and slightly slack. The slack will be greater if you are covering a wing with a curved airfoil.

At this point I formerly misted some 3M spray onto the wing, or whatever I was covering, and then laid the wing onto the slack film. Four things invariably happened. They are:

1. The film never ended up flat on the wing.
3. The slack varied when the film jumped and messed up the airfoil shape.
4. I got into a foul mood.

For the 92 Pieces, I changed my technique. The wing was laid on the film dry without any adhesive. The frame could then be adjusted to straighten out any wrinkles and have the slack match the airfoil shape. After adjusting, I sprayed some 3M into a cup and added thinner to it until it was mostly thinner and a little adhesive. I used a very small brush to paint the thin adhesive on all the outlines and ribs where the film was supposed to stick to the wood. I had to let it dry for some minutes. Acetone may be a quicker drying solvent, but I didn't know if it would cloud the film. Once the adhesive was dry, the film was cut along the wood outlines with a hot wire cutter (Dr. Bates wonder cutter). I was very pleased with the resulting covering job.

Note that there are no ends to my frame. The end of the film is not supported by the frame. This is an advantage because I can build the dihedral into a wing and then cover it, one panel at a time, by using film lengths just a little longer than the panel to be covered. The lack of ends on the frame allows me to (carefully) lay a tip panel on the film, attach it with liquid adhesive, and then cut it away from the frame. When doing this, the rest of the wing must be supported correctly to get the tip panel to lay flat onto the film.

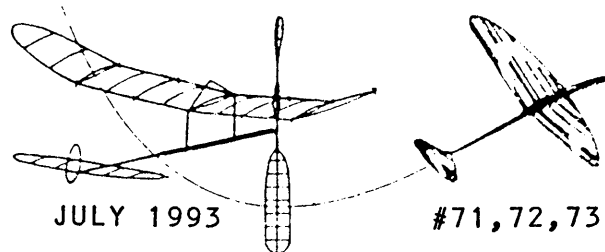


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One billion gallons of gas per year would be saved if all US autos used the minimum octain gasoline recommended by their automobile manufactures. Most cars don't increase their mileage or performance with high octane fuel. More crude oil is required to refine high octane gas than standard 87 octane gas.
(US Dept. Energy via Trib.Media Services)

INDOOR

NEWS and VIEWS



JULY 1993

#71,72,73

EDITOR: Plenny J Bates 2505 White Eagle TRL SE, Cedar Rapids IA 52403. Voice: 319-362-2969

NEW EDITOR: Lester W Garber 2324 E 5th ST, Duluth MN 55812. Voice: 218-728-6827
Fax: 218-728-6841

DON LINDLEY

Don Lindley was my best friend and I imagine that there are many people around the world who are saying the same thing. I remember how he would greet me with his warm, double-barreled hand-shake and we would pick up where we had left off a month or even a year ago. We never got talked out and I could share my wildest ideas, dullest stories and deepest fears with this man. When we parted, he would leave me with his so eloquent "As ever, tiger. Hang in there."

You could never know everything about Don-- he had so many talents and seemed to know something about everything. He was an engineer, superb model builder, artist, actor, pilot and teller of stories, sometimes irreverent, which got better and longer as the years passed. He was interested in all things aeronautical and mechanical, except for computers, which he never liked. He worked hard for model aviation often behind the scenes. His work on the 1987 National Free Flight Society Symposium was a labor of love. (Ed. note: If you have a copy, read page 19 for a wonderful insight to Don's humor and intelligence.) Don's family has requested that memorials be made to the AMA Scholarship fund, a fitting tribute to one who cared so much about young people and their plans and dreams.

Don was born in West Virginia in 1931 and started work at Langley Field, for NACA, in 1949. While in Virginia, he met his wife-to-be, Jane. She was a Southerner, he a "Gunrunner", she was a flatlander, he a mountainman. They married and the Civil War began anew. They had three of the finest children anyone could want: Bob, the eldest, married to Kim; Ann, a teacher living in Dallas; and David, attending the University of Texas in Austin. Don and Jane were the most hospitable people I know. It seemed they always had a house full of company at their home in Naperville, Illinois where Don worked for AMOCO as a research engineer. They also loved to travel and visit friends around the world.

At Johnson City 1992 Don had some beautiful models which he didn't get much chance to fly. He sat at one end of the big Dome and talked to everyone who came by, listening carefully to all complainers, reminiscers, questioners, rule-benders, etc., giving all his most considered opinions in his role as Contest Board Coordinator. Wally Simmers had to pick up his bench and move to get some peace and quiet. At that contest Don was also C.D. for the Helicopter-Autogyro events. When he did manage to fly his models he finished second in Bostonian. He did not say much about it but I think it meant a lot to him and I'm glad he got to take home a trophy.

Once when Don was visiting with us I was proudly showing him my collection of wood and rubber. He laughed and asked me why I was saving the good wood. And so I pass along my favorite Don Lindley saying:

USE THE GOOD WOOD !
you ain't gotten any younger !

Hey old tiger ! -- until next time !

As ever,

Jim Clem

DON LINDLEY

John Worth a longtime friend of Don has written "Memories of the Man" which will appear in a upcoming issue of Model Aviation. In fact it may beat this newsletter to your door. Please look it up for it is Worth reading. Don would have liked the pun. Some of the following is from my personal knowledge and some from John. Don usually had an opinion on most anything and it would be well considered and worth your time to listen carefully. He had a capacity to retain and analyse facts second to none, and a wonderful sense of humor. On the rare occasion when you caught the punch line before he could deliver it, it was funnier because he would make it so. He was intelligent, talented and sophisticated yet always had the capacity of a child to be amazed. He loved to tell stories about the building techniques of others that no one else could duplicate. I was referred to Don in the late 70's by Maynard Hill as a source of oil for a R/C duration record attempt. I got the oil and two or three pages single spaced about the oil and how to use it. Much later I was surprised to learn that he was not a chemical engineer. That was only one of many surprises when it came to his talents. I learned not to be surprised when a large envelope of useful material came from Don in response to a casual question about some modelling matter. He was Special events Contest Board Chairman And Coordinator of AMA's Contest Boards for years because he was the most qualified person for those jobs which take a broad based knowledge of model aviation. I, many others and the modeling world in general have lost a grand friend.

My sympathy goes out to his family.

Plenny J Bates

NOTE: As of NOW your editor is

Les Garber. His address is above.

MIAMA GRAND PRIX

Results from Doc John Martin

COCONUT SCALE 13 entries				best fly	total
	stat pts	fly pts			
1 Rees - Travelair	2	2:02	4	6 *	
2 Eggert - Alrcoach	4	2:10	2	6 *	
3 McGillivray - Curtis-Reld Bipe	5	2:17	1	6 *	
4 Blair - Alexander Eaglerock	8	1:54	(5)	13	
5 Savage - Groussard	10	1:53	(6)	16	
Rees - Fiesler Storch	1	1:48	(7)	8	
Rees - Zippy Sport	6	2:07	(3)	9	

* Tie broken by lowest static score

COCONUT MASS LAUNCH 12 flew

1 Eggert 2 Blair 3 Rees

PISTACHIO SCALE 21 entries				total pts
	best time			
1 Iacobellis - Martin MO-1	1:19	10		
2 Coughlin - Mubousin PM X	1:34	11		
3 Linstrum - Folker Universal	1:30	12		
4 Martin - Goldwing Ultralite	1:31	12		

PEANUT SCALE

	subject	
1 Ganser	Volain Hydro	209.5
2 McGillivray	Isaac's Fury	207.0
3 Miller	Volain Hydro	204.0
4 Bourke	Farman Moustique	176.5
5 Weckerly	Waco E float	172.5
6 Eggert	Fokker D-7	168.0
7 Hines	Heinkel HE 100V	159.0
8 Martin	Goldwing	152.0
9 Fink	Fokker D VII	151.5
10 Fink	Avia Racer	145.0
11 Thompson	Lacy M 10	133.0
12 Buxton	SESA	126.0
13 Sanders	Cougar	115.5
14 Grant	Sperry Messenger	108.0
15 Stevens	Cougar	90.0
16 Sydor (JR)	Jodel	73.8

NO-CAL SCALE

BOSTONIAN				clarisma	total
	time	time 2 best			
1 Loucka	6:40	1 Miller, R	545	1.14	621.30
2 Slusarczyk, C	6:29	2 Buddenbohm	501	1.16	581.16
3 Obarski	5:23	3 Boyles	485	1.18	572.30
4 Henderson	5:19	4 Coslick	472	1.14	538.08
5 Robelen	5:11	5 Avery	442	1.18	521.56
6 Ganser	5:07	6 Marett	451	1.09	491.59
7 Garber	5:03	7 Blair	394	1.15	453.10
8 Eggert	4:43	8 Ganser, R	396	1.09	431.64
9 Baird	4:41	9 Weckerly	363	1.09	395.67
10 Bourke	4:16	10 Barker	316	1.17	369.72
11 Marett	4:15	11 Thompson	331	1.10	364.10
12 Romash	4:12	12 Robelen	303	1.10	333.30
13 Voorhees	4:09	13 Phillips	299	1.03	307.97
14 Coslick	4:02	14 Fink	274	1.09	298.66
15 Buxton	4:01	15 Peterson	244	1.12	273.28
16 Leifer	3:58	16 Konefes, E	244	1.10	268.40
17 Warmann	3:44	17 Sanders	200	1.08	216.00
18 Stonecipher	3:24	18 Konefes, S	151	1.08	163.08
19 Von Bueren	3:20	19 Van Dover	127	1.08	137.16
20 Konefes, E	2:56	20 McIlrath, PN	99	1.18	116.82
21 Barry	2:39	DNF Henderson-Ganser, J-Nusser-			
22 Konefes, J	1:57	Buxton-Smith-Martin-Obarski-			
23 Diebolt	1:52	Knight-Hartman-Thomson-Plassman-			
24 Van Dover	1:34	Plasserelli-Sullivan, E-Grant-			
25 Nuszer	1:24	Pavek-Stevens-Barry.			
26 Campbell	1:19				

AMA RUBBER SCALE

	subject	
1 Blair	Georgia Special	180
2 McGillivray	SE5 Replica	174
3 Rees	Martinside "Buzard"	170
4 Passarelli	Nesmoth Cougar	166
5 Nuszer	Cessna 1911	157
6 Hines	Curtiss Robin	
	(Corigan)	122
7 Miller, J	Volson Hydro	89
8 Martin	LePelican Ultralite	86

PEANUT SCALE

	subject	
1 Ganser	Volain Hydro	209.5
2 McGillivray	Isaac's Fury	207.0
3 Miller	Volain Hydro	204.0
4 Bourke	Farman Moustique	176.5
5 Weckerly	Waco E float	172.5
6 Eggert	Fokker D-7	168.0
7 Hines	Heinkel HE 100V	159.0
8 Martin	Goldwing	152.0
9 Fink	Fokker D VII	151.5
10 Fink	Avia Racer	145.0
11 Thompson	Lacy M 10	133.0
12 Buxton	SESA	126.0
13 Sanders	Cougar	115.5
14 Grant	Sperry Messenger	108.0
15 Stevens	Cougar	90.0
16 Sydor (JR)	Jodel	73.8

USIC/NATS 1993

FILE: USICRZB.93

Easy B

1 Calliau	24:32
2 Grant	23:34
3 VanGorder	22:17
4 Hunt	21:46
5 Coslick	21:26
6 Nolin	20:51
7 Robelen	20:51
8 Tagliafico	20:41
9 Garber	20:39
10 Wardcastle	20:25
11 Henderson	20:06
12 McGillivray	19:54
13 Wisniewski	19:00
14 Ganser	18:51
15 Obarski	18:48
16 Thompson, M	18:25
17 Slusarczyk, C	17:55
18 Eggert, W	17:49
19 Miller, Rich	17:46
20 Marett	17:41
21 Green	17:37
22 Hartman, P	17:26
23 Phillips, H	16:59
24 Linardic (SR)	16:56
25 Shepherd, J	16:49
26 O'Grady	16:32
27 D'Alessandro	16:31
28 Romash	16:29
29 Vallee, Tom	16:28
30 Barker	16:20
31 Clem, Jim	15:59
32 Fink, S	15:54
33 Vancil	15:44
34 White, Roy	15:33
35 Buxton	15:06
36 Eberle, B	14:48
37 Barber, Doug	14:38
38 Leifer, L	14:32
39 Weckerly	14:23
40 Rash, Fred	14:03
41 Belleff, D	14:00
42 Sydor, C (JR)	13:02
43 Diebolt	12:54
44 Zwielt	12:41
45 Singer	12:39
46 Plassman, G	12:26
47 Jones, R	11:18
48 Williamson	11:14
49 Martin	10:54
50 Fellin	9:43
51 Chilton	9:10
52 Eberle, R (SR)	9:10
53 Van Dover	8:37
54 Mrzos	8:29
55 Italiano, Tony	7:18
56 Plassman, J (SR)	6:42
57 Barr, L	6:10
58 Chabot, G	6:07
59 Sullivan	2:02
DNF Archibald - Brown	
Campbell - Couture -	
Forward - Grubbs -	
Hacker - Loucka -	
Mzik - Nuszer -	
Redoff - Slusarczyk, D	
Thomson - Williams, W	

HAND LAUNCH GLIDER

	Time
1 Buxton	149.0
2 Boehm	147.4
3 Thompson	138.6
4 Kimball	122.8
5 McIlrath P J	118.8
6 Buddenbohm	113.7
7 Romash	111.3
8 Plassman	106.0
9 Von Bueren	103.6
10 Peterson	91.5
11 Jessup	89.9
12 Slusarczyk C	81.5
13 Belleff	79.8
14 Stevens	57.0
DNF - Schlarch, W -	
Shepherd - Hartman -	
VanDover	
SR	
Plassman	93.3
JR	
Sydor	87.2

FEDERATION R.O.G.

1 Tagliafico	8:12	OR
2 Clem	7:10	TX
3 Coslick	6:54	MO
4 Coughlin	6:40	OR
5 Baird	6:29	Tn
6 White	6:25	MO
7 Rash	6:15	Tn
8 Radoff	5:07	NJ
9 Barber	4:56	NJ
10 Ripley	3:25	TN
11 Leonard	3:02	VA
12 Leonard (JR)	2:18	VA
13 Green	1:22	PA

MANHATTAN CABIN

1 Van Gorder	11:56
2 Ganser	11:39
3 Marett	11:12
4 Loucka	11:04
5 Krush	10:56
6 Grant	10:24
7 Avery	10:22
8 Coslick	10:20
9 Barr	10:00
10 D'Alessandro	9:40
11 Triolo	8:47
12 Weckerly	8:32
13 Miller	7:42
14 Phillips	3:50
15 Van Dover	2:45
DNF Plussman - Green	
Slusarczyk, D and C	

FILE: USICROGC.A93

R.O.G. CABIN

1 Ganser	27:00
2 Loucka	24:33
3 Belleff	21:49
4 Iacobellis	17:46
5 D'Alessandro	17:14
6 Krush	16:46
7 Williams	16:28
8 Marett	13:31
DNF Slusarczyk -	
Vallee - Hacker	

FILE: USICHLST.93

HAND LAUNCH STICK

1 Doig	38:37
2 Grant	32:56
3 Williams	32:19
4 Hunt	31:37
5 Chilton	31:16
6 Slusarczyk	31:09
7 Shepherd	30:48
8 Wardcastle	29:45
9 Underwood	29:02
10 Chabot	27:43
11 Vallee	26:35
12 Mzik	26:05
13 Hacker	24:29
14 Linardic	21:15
15 Burke	20:01
16 Belleff	13:03
DNF Landrum - Louka	

35 CM MICROFILM

1 Shepherd	21:55
2 Eggert	20:43
3 D'Alessandro	19:44
4 Krush	17:37
5 Underwood	16:29
6 Williamson	15:46
7 Chabot	15:17
8 Vallee	13:53
9 Jones	11:07
10 Landrum	8:32

SRNIOR

1 Eberle	10:22
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CATAPULT GLIDER

	Time
1 Plassman	162.8
2 Thompson Mike	162.5
3 Schlarch W	161.4
4 Warmann	159.0
5 Schlarch R	156.8
6 Fulmer	152.7
8 Nolin	152.1
9 Belleff	151.5
10 Garafolo	150.7
11 Vancil	147.6
12 Von Bueren	146.3
13 Konefes E	145.2
14 Buddenbohm	138.0
15 Person	137.0
16 Buxton	133.0
17 Greene	123.7
18 Wisniewski	121.0
19 Rash	114.4
20 Garber	113.0
21 Peterson	108.5
22 Konefes J	106.9
23 Jessup	104.0
24 Radoff	102.0
25 Romash	96.8
26 Weckerly	96.4
27 Sydor (JR)	92.6
28 McIlrath P J	91.1
29 Triolo	88.6
30 Leonard (SR)	83.2
31 Plassman (SR)	79.5
32 Vancil	73.2
33 Forward (JR)	32.5
DNF Shepherd - Mrzos -	
McIlrath P N - Diebolt	
Tenny - Doig - Thomson	
Landrum - Plassman -	
Italiano - Sanders -	
Klintworth - Culpepper	

USIC GRAND CHAMPION

1 McGillivray	632.3
2 Ganser	614.2
3 Coslick	580.7
4 Marett	534.0
5 Grant	497.5
6 Williams	451.6
7 D'Alessandro	445.3
8 Krush	442.1
9 Vallee	412.2
10 Eggert	320.4
11 Slusarczyk	288.0
12 Shepherd	250.4
13 Hartman	236.6

Junior

1 Linardic	342.3
2 Forward	36.4

FAC GOLDEN AGE

C.D. Jim Miller total 3 flts

1 Stu Weckerly	Stout 2-AT	364
2 Walt Eggert	Cessna C-34	345
3 Doc Martin	Farman Strato	254
4 Stan Fink	Luton Minor	240
5 John Blair	Heath Hiding	171
6 Mike Hines	Curtiss Robin	50

FAC Hi-Wing Monoplane

C.D. Jim Miller

	best flt	scale	pts	Total
1 Mike Thompson- Lacy	51.5	82.5	134	
2 Stan Fink- Vagabond	51	78	129	
3 John Blair- Elias	45.5	59	104.5	
	Airport			

FAC WWI COMBAT 3 rounds

C.D. Jim Miller

1 Larry Loucka	DH-6
2 Jim Buxton	SE 5 A
3 Walt Eggert	DVII
4 John Blair	DH-6
5 Stan Fink	DVII

FAC RIPLANE

C.D. Jim Miller

1 Doc Martin- Astra	77.5	47	124.5
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FAC SCALE

	flt	scale	Total
C.D. Jim Miller			
1 Passarelli- Couger	0	82.5	56.5
2 Wickerly- Found/floats	15	56	52.5
3 Hines- Lippisch P-13	15	34	52
Rees- Martinsydz Buzzard			
Rees- Fiesler Storch			
Blair- Cessna C-34			
J. Miller- Voisin			

FAC PEANUT

C.D. Jim Miller

	best flt	scale	Total
Mike Hines- Heinkel V-8	10	64.5	55.5
Jim Miller- Voisin	DNF		130

FAC AT JOHNSON CITY

Jim Miller noted that the Johnson City USIC/NATS has a lot going for it for FAC events. The site is super, almost like outdoors with zero wind and never a chance of rain. FAC itself has a lot going for it in that the models do not need to be true scale (enlarged tail no loss of points) this encourages modeling subjects that would be impossible for AMA scale and gives the modeler a fighting chance of seeing his work fly well rather than losing it in trimming.

UNLIMITED SPEED

time

MORE USIC/NATS 1993

PENNYPLANE

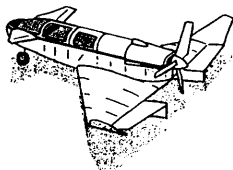
1	Winniewski	16:11
2	Bourke	15:45
3	Henderson	15:37
4	Coslick	15:32
5	Slusarczyk, C	15:28
6	Hardcastle	14:33
7	Hartman	14:11
8	Clem	14:00
9	Wermann	13:59
10	Iacobellis	13:43
11	Nuszer	13:35
12	McGillivray	13:17
13	Marett	13:12
14	D'Alessandro	13:09
15	Vencill	12:17
16	Phillips	12:15
17	Garber	12:09
18	Romash	12:08
19	Barber	12:02
20	Ganser	11:57
21	Radoff	11:57
22	Hacker	11:55
23	Boone	11:41
24	Krueh	11:18
25	Vallee	11:18
26	Mzik	10:56
27	Buxton	10:41
28	Konefes, E	10:26
29	Eberle, B	10:09
30	Sullivan, E	9:59
31	O'Grady	9:54
32	Fellin	9:52
33	Zufelt	9:49
34	Landrum	9:33
35	Italiano	8:47
36	Jones	8:39
37	Grant	7:52
38	Grubbs	7:20
39	Wzros	7:17
40	Gaertner	6:29
41	DNF Jones, J - Ganser, J	
42	VanGorder - Thompson - Geyer - Nelson - Green	
43	Pleasantman - Barry - Ripley - Slusarczyk, D - White	

SENIOR PENNYPLANE

1	Linaridic	11:03
2	Eberle, R	4:34

JUNIOR PENNYPLANE

1	Sydor	10:37
2	Forward	2:40



TOM VALLEE AND JIM CLEM V.P. PROPS

Tom Vallee and Jim Clem sent drawings of v.p. propellers based on the design by Cezar Banks. Each added a screw adjustment to preload the spring that reacts to the torque load to change the pitch. So both has screw control of high pitch, low pitch and start of change from high to lower pitch. The drawing of Tom's hub did not reproduce well enough for printing but as it is somewhat different from the Clem hub. Those who anticipate making a v.p. hub would do well the write to Tom (SASE of course) and ask for a drawing of his hub.

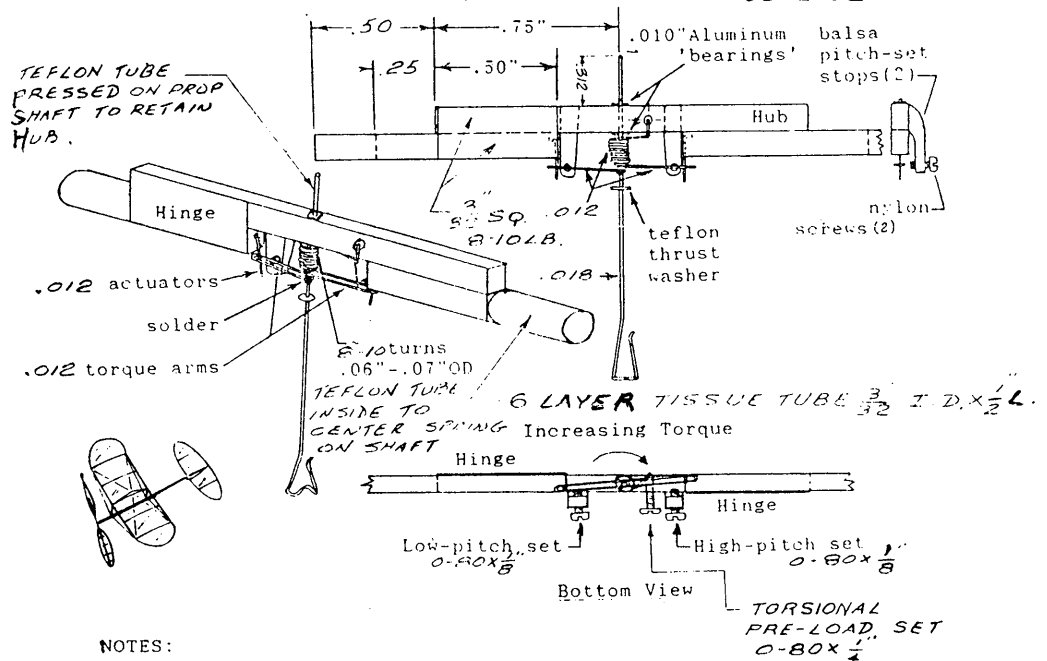
Tom Vallee
444 Henryton So
Laurel MD 20724

ADJUSTABLE VARIABLE PITCH PROP

by Cezar Banks
July '90

V.P. PROP. MODIFIED FOR P.P.

BY JIM CLEM
JUNE '92



NOTES:

Hinges are iron-on Monokote or Micafilm.
Ends of nylon screws act as adjustable stops to rotation of torque arms.

O-80 Nylon screws are available from:
Small Parts Incorporated
6901-N.E. Third Avenue
P.O. Box 1321736
Miami, Florida 33238-1736
Ph. 1-305-751-0856

Threads in balsa stops are 'cast' out of cyano using O-80 steel machine screw as a mold. Force screw it out when cyano has 'set'.
Torsional pre-load on spring determines when 'switchover' starts. I try for 2-4 minute mark. To adjust, bend free end of spring or add shims where spring end is glued to hub. Transition time to reach low pitch stop is determined by number of coils and coil diameter.

NOTE: BE SURE AND REVIEW BOB RANDOLPH'S ARTICLE "TOP CAT 904-1" IN THE SEPTEMBER 1991 ISSUE OF MODEL AVIATION

Jim set a CAT I Pennyplane record with this hub in April at the FAI regional and record trial, Bedford TX. The old record from 1988 was 11:31 and Jim has worked on it for years without result until April when he made four flights all exceeding the old record. Out of the box warm up was 11:58 then a 11:56 then a 11:52 (no touch !) and the last 12:46. Jim thinks this "standard" pennyplane biplane can do 13 minutes CAT I. And this plane that is 3.31 grams because of patches following being "run over" by a 6.2 gram LO-CAL.

***** CONNECTICUT AREA *****

Glastonbury Connecticut area modelers should be quick about checking out the Glastonbury Modelers Club. They fly indoor and outdoor FAC type models. Do not worry about being hit by an out of control 1/4 scale monster or getting some social disease as these fellows are pure, pure gumbanders that is, so don't worry join the fun.

CONTACT:

George B. Armstead, Jr.
89 Harvest Lane
Glastonbury Conn. 06033

DOUBLE WHAMMY

LAKEHURST FLYING 1993

Chuck Marcos

I can give some history but not much in the way of development since it has never been changed from the first day the plans were laid out. (Intent was to develop "one design" more sophisticated than the delta dart-- PJB) The basic construction was 1/16" sq (even the ribs) and the delta dart prop and bearing had to be used. That meant no rolled tissue sockets, no Japanese tissue or condenser paper, and no music wire. A rather smallish horizontal stabilizer was used to allow the use of very light wood and still have a rugged model. The wing warps, tailboom offset, and wing offset were standard indoor trim. It was found that some left thrust was necessary after test flights. The tip LE was swept back so the novice could assemble the model with the LE forward. I wrote an article for the NFFS which appeared in the April, 1979 issue. Editor John Oldenkamp gave it the name "Double Whammy" because a second, more advanced model, was built as a novice pennyplane from the same plans using a 12" sheet balsa propeller and a 0.1 mil mylar covering. The idea was to move the absolute novice from delta dart to indoor stick using components and knowledge gained from the previous model to aid in his advancement. Following its publication, I received 40 or 50 requests for plans each accompanied by an SASE.

For competition with the double whammy, a 24" strand of 1/16" FAI (black) rubber was supplied to each contestant. If you break it, tie a knot! At the 1979 or 1980 West Baden USIC, we sponsored the first "cash bash". Plans and props were supplied. The mass launch event was won by my son Aaron. He built every bit of the model too! I only told him when to stop winding. ever since that time, the event has mostly been flown as a cash bash. The initial rounds are always thrilling to see with 15 to 25 models being launched simultaneously. I especially like to see the interesting color schemes that folks come up with using gift wrap paper.

I have built 4 or 5 of them with a record assembly time of 90 minutes once the wood is selected. I use only Ambroid glue and nitrate dope. I've noticed that it doesn't help to take great pains to reduce the weight much below 5 grams and if you do, a rather flimsy model results. The biggest performance boost comes from knowing how to wind the motor and also by adjusting the propeller pitch to optimize the flight path to the site.

Gary Underwood has again lined up a large number of dates at the United States Navys' Lakehurst Airship Hanger Number One. You will need membership in East Coast Indoor Modelers (active since 1931), cost \$40.00 for 1993, and following information, in this order and by numbers: (1) Name, (2) Address, (3) Telephone number, (4) AMA number, (5) Contest director Yes - No, (6) Drivers license number, (7) Vehicle make, (8) Vehicle model, (9) State & license plate number. Last year's members note changes. Flying started in May and will run into the Fall. This is a military installation, you must have AMA membership and supply the information above. Well worth the price to fly in such a vast space. Contact:

Gary Underwood
East Coast Indoor Modelers
9 Treelawn Terrace
Mercerville NJ 08619

All told there are 54 flying dates. Gary and Kit encourage membership in the Navy Lakehurst Historical Society (\$6.00/yr) as this group is important to the efforts of the East Coast Indoor Modelers in retaining the use of Lakehurst as a flying site.

MACE MODEL AIRCRAFT CO.

Don Mace has just released catalog No. 6. Listed are five Mace kits, EZB, MiniStick ("Densect"), HL glider, and two beginner level models with plastic props the P-18 Hawk and the P-24 Condor. The 18" Hawk and the 24" Condor built by the thousands have proven a nice big step up in performance from the AMA Racer and AMA Cub. Don has ten of his plans for sale and in addition is a source for Micro-X kits, Peck kits and accessories, and some other indoor needs. Send \$ 1.00 for the catalog to:

Mace Model Aircraft Co.
359 South 119 th East AVE
Tulsa OK 74128

PECK-POLYMERS NEW CATALOG

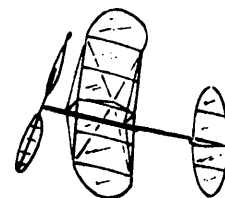
A beautifully produced forty 8 1/2 X 11 pages filled with the stuff gum band twisters love. Partial list: 248 plans by 31 designers, 32 three views, one page props, one page CO 2 - Brown and Gasparin, R/N - Lees - West wings kits, 29 Peck kits, VL and Silver Streak electric, Peck blimps, Airtronics and Cannon R/C (ugh) systems, modeling tools, Hannan - Ross - Hall - Warner and other books, A new CO 2 - HEIBI, and much more. Worth the \$4.00

TO: PECK-POLYMERS
P O Box 710399
Santee CA 92072-0399

Phone: 619-448-1818

FAX: 619-448-1833

They Take Visa, Master Card, and Am. Express



4 FREE FULL SIZED PLANS IN THIS ISSUE

DOUBLE WHAMMY FULL SIZED PLAN THIS ISSUE

FINDING A SITE - IT IS EASY

Thoughts on how to get and keep a site. When you have spotted a possible site be sure to talk directly to the person who has the authority to give permission for use. An intermediary will certainly garble your message from lack of knowledge of indoor flying. A good pitch to the head person will make it very hard for them to say "no" on any basis other than schedule conflict.

Prepare yourself with the answers to the questions that are sure to come. What organization do you represent, if any? How much of the facility do you need? How many people will be involved? The ages of those in charge? What are the liability risks to the site owner? You must have full answers to these questions.

AMA Insurance should settle most risk concerns. Carry the AMA Insurance Information sent to every member with you. It is a great selling tool. The fact that the AMA is the official voice of aeromodeling in the U.S.A. will carry some weight. You will need the flying site, and access to rest rooms. The number of people at your usual meeting will not approach the number in your club especially if it is a general interest club. Many people think that modeling is a child's game so be sure to point out that most will be stable old folks. At this point the site owner is still thinking of a eight pound model with a screaming 60 up front. Now, brake out a well trimmed indoor model that is almost ready to fly. Wind to a bit more than level flight torque and demonstrate. The slow flight will dissolve most doubts as to risk. Showing a well done peanut scale could be a good idea as everyone likes miniatures. Now you may get a hundred questions from a fascinated person that controls the use of the site. Don't make it complicated, take a minimum of planes and equipment.

With the above method I have never been turned down. There are still some things that can make a site useless such as heating that cannot be turned off or high rent. Helping youngsters or using the formal AMA Adopt a School program may pay the rent.

For keeping the site a few enforced rules can go a long way. Leave the site cleaner than before you came. This can make or break it for you. Put everything back in its place. Wear only specified footwear on the floor. Get to know the person in immediate control of the site (as the janitor), make them happy with you. Don't just go to them when you need something. If they relate well to you, you will be able to nip problems in the bud. Send them and the one who gave permission club newsletters and at the end of the season a "thank you." Also place a "thank you" in the club newsletter.

I hope my experience will help you get and keep a site.

Happy Rafter Banging,

Michael Spless
225 Pine
St Peter MN 56082-2226



NOTE: Michael is a outdoor FF flyer who has been flying indoor for about one year. He did not know "It cannot be done." May we all learn from him.

Get a local site. GET A LOCAL SITE. It can be done most anywhere. It may take several attempts at several places but it can be done. This is not only for your new flyers but is for you as their numbers may be needed to get the site. The person who controls the use of the hall you want thinks of a model airplane

as a thing with a chain saw engine on the front. So do not forget to take a ready to go model (as a LPP and / or scale) to demonstrate. At present the AMA does not have a packet for getting an indoor site but Doc Martin has some material that may be of use. The AMA can be a big help if the site owner wants proof of financial responsibility and your group members belong to AMA. This got the indoor flyers in Des Moines a site. Expect to pay a fee for use of most sites.

We do not have 10,000 active indoor flyers. Why, because they do not know this end of the hobby exists, in error think it is "harder than anything they could do" or do not know that they can get a site. It is a reality that indoor does not have heavy duty business interested in promoting it. The AMA and certain people in the model industry have given good support but most of it is up to us, one on one. JUST DO IT !

Covering with Ultra-Film
By Bob Randolph

Last week I read Roger Schroeder's fine article on covering in the April 1993 issue of IN&V. While I like most of what Roger says, there is an easier, quicker, and lighter method. Coat the wing ribs and spars with the thinned out 3M and allow to dry completely. Place the wing upside down on the covering frame exactly where you want it. Use a clean brush to gently apply rubber cement thinner. The fluid will spread rapidly to the spars and ribs dissolving the 3M and bonding the film.

This method is so fast and easy that once you have tried it, you will never use any other.

STARLINE INTERNATIONAL

Sal Fruciano at Starline is now importing a precision rubber stripper from Poland. Price \$95.00. Catalog of imported free flight items is one dollar. Starline International
6146 E Cactus Wren
Scottsdale AZ 85253

DOMEDUSTER PLAN PACKET No. 2

Stan Fink is at it again. An even dozen plans by nine designers. Two winning Ministicks, an EZB and a Limited Pennyplane comprise the duration section. The remainder are a nice selection of scale models. It is all indoor so for \$8.00 postpaid you cannot miss with this one. Make checks payable to Stan Fink.

Address: Stan Fink
1810 Pine ST
Philadelphia PA 19103

Phone: 1-215-732-5014

SOURCES FOR SMALL DIAMETER REAMERS

Several years ago, I bought a set of small diameter tapered reamers which have proved very useful for indoor work. My set consists of about a dozen tools, ranging from about .006 (tip of smallest) to .093 (shoulder of largest). I think they came from Timesavers, and cost around \$15.

These tools are used in antique clock repair. If you phone, be prepared for a possible language barrier: they may call them "broaches", and talk in metric sizes.

Paul McIlrath

Timesavers	Merits Antiques
Box 400	P.O. Box 277
Algonquin, IL 60102	Douglassville, PA
708-658-2266	19518-0277
Catalog: \$3.00	215-689-9541
	Catalog: \$ 3.00

FROM: SAM 86 SPEAKS

STORING RUBBER MOTORS

by Bill Henderson (from the MAAC mag)

There has been a lot of discussion in various newsletters around the world recently about the best way to store your rubber motors. The traditional way has been to put them into paper envelopes, but this has its problems since brown Kraft paper is acidic in nature and bleached white paper has residual acid and bleach chemicals in it. These attack the rubber and cause it to become brittle and break easily, usually well below the normal expected breaking turns. Museums have faced this problem in using artifacts and now use special acid free paper for storage containers, but it is expensive.

A cheaper substitute is the glassine envelopes used by stamp collectors which have an acid free wax based surface. Other people have been using plastic bags, with or without the snap sealing edge. It has come to light that these bags are made from many different materials, some of which, particularly PVC, are as bad for rubber as acid paper. PVC contains plasticizers to make it flexible and these can leach into the rubber with dire consequences.

The best plastic bags to use are those made from either polyethylene or polypropylene, which are, basically, sophisticated waxes that do not affect rubber. How can you tell the difference when the type of plastic used does not appear on the package? Fortunately there are a few simple tests that will help you identify the good bags based on the way the plastic burns and on its specific gravity. When you put a match to a PVC bag it burns with a sooty, yellow flame and has an acrid smell. Polyethylene and polypropylene burn with a blue edged flame and smell like burnt wax.

Unfortunately the latter two are sometimes compounded with other polymers that are not good for rubber storage but these will not necessarily change the appearance of the flame.

Since the unmodified polyethylene and polypropylene are lighter than water (S.G. 0.92-0.97) and PVC is heavier than water (S.G. 1.2 and higher) then the following method will tell you what you have. Take one of the bags, open it up and fill it completely with water. Now put the full bag, with open

edge up, into a deep pan of water and pull it to the bottom. If it stays there it is PVC or a modified polyethylene/polypropylene, and do not use for rubber storage. If it slowly rises to the surface of the water it is unmodified polyethylene or polypropylene and is OK to use for rubber storage.

FROM: SAM 86 SPEAKS

USING DOUBLE TISSUE

from Alit Vogelmann

Back in the thirties, some of us covered our newfangled gas models with two layers of Japanese tissue because it was tough, low priced, inexpensive, and cheap. I had forgotten all about it until I read of some ingenious indoor applications of double tissue by the late Ken Groves. He detailed the technique in the article on his Bristol Scout in WINNING INDOOR DESIGNS, 1987 - 89, published by the NFFS.

Ken pre-doped and laminated two or three layers of tissue and used the material to cover cowls and turtledecks. The laminated tissue, much lighter than bond paper, is stiff enough to be used without supporting formers and stringers in many indoor applications. Ken even further stiffened appropriate areas by pre-creasing the stuff to simulate fabric-over-stringers.

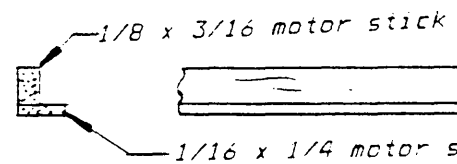
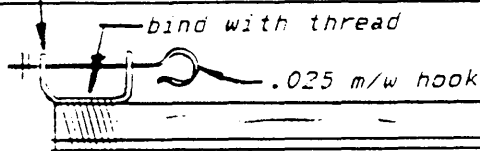
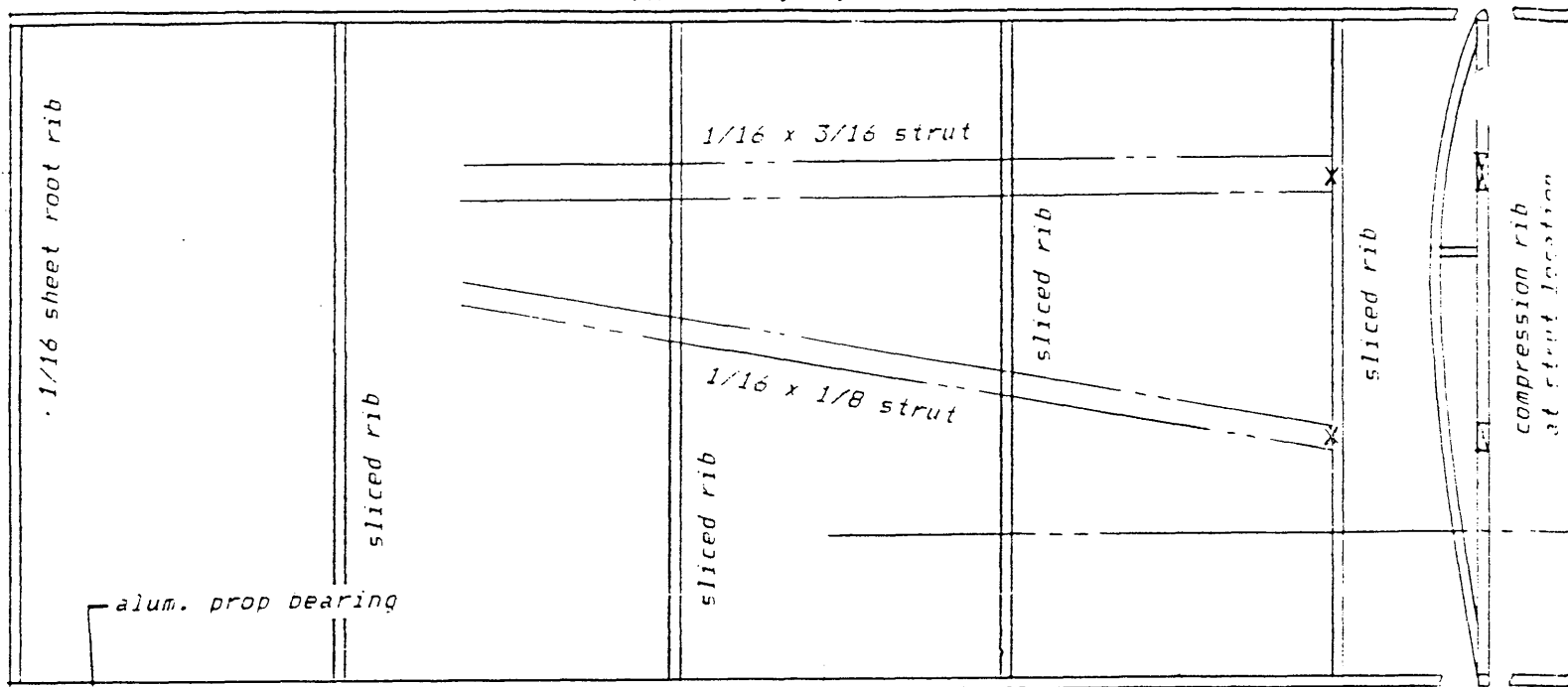
I have used it for turtlebacks, cowlings, wing fillets and tips, and the center panels on a gull wing design. The greatly increased strength and manageability of double tissue make the cutting and application of identification numbers, canopy or cabin trim, and pencil-thin control surface outlines much easier also. It's worth trying for this alone.

Summarizing the procedure: Two moderate size tissue blanks are saturated with dope and pressed together on a clean, flat surface such as a piece of glass. Wrinkles and bubbles are worked out with your thumbs while the dope dries. The dried material can be attached to the frame and trimmed in the usual way. Or the tissue can be cut to size before application. If the underlying surface has been doped, acetone or thinner can be used to adhere the pre-doped covering. Glue stick or thinned white glue works on undoped structure.

WINNING INDOOR DESIGNS- 87-89 is available again from NFFS. Get a copy and read Ken Grove's Bristol Scout article for details. you'll find that the entire book is loaded with valuable plans and ideas covering every phase of indoor flying.

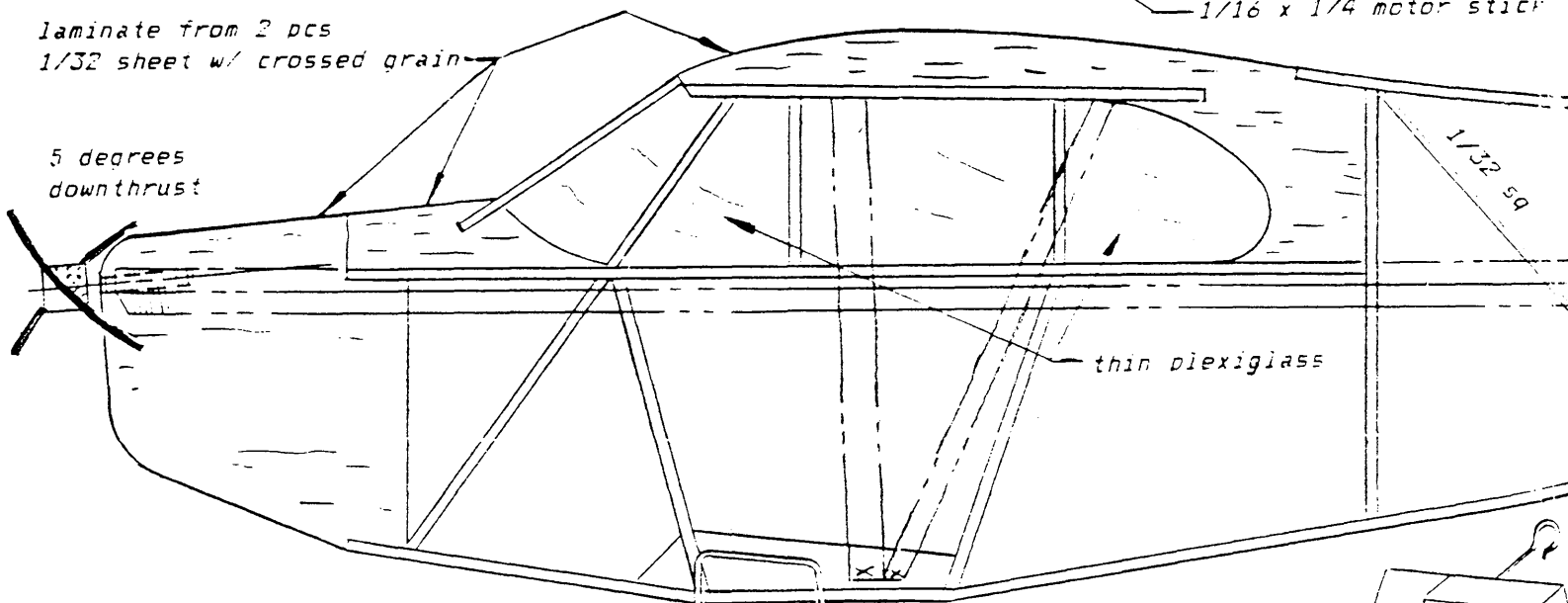
NEW 98 FOOT SITE ?

From C I A Informer - Stan Chilton has a potential Lake Charles LA site with a 98 foot ceiling and no open girders. The Lake Charles people are eager to have an annual event. Stan is shooting for a trial gathering of fewer than ten flyers sometime in Oct. or Nov. with a goal of a large yearly contest in conjunction with Mardi Gras.



laminate from 2 pcs
1/32 sheet w/ crossed grain

5 degrees
downthrust

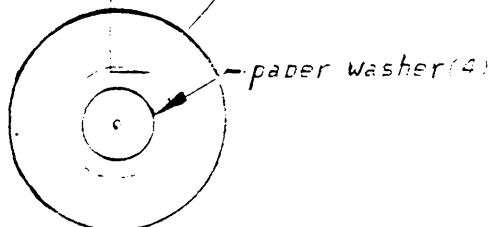


card stock fairing

NO CLASS
NO CAL CUB

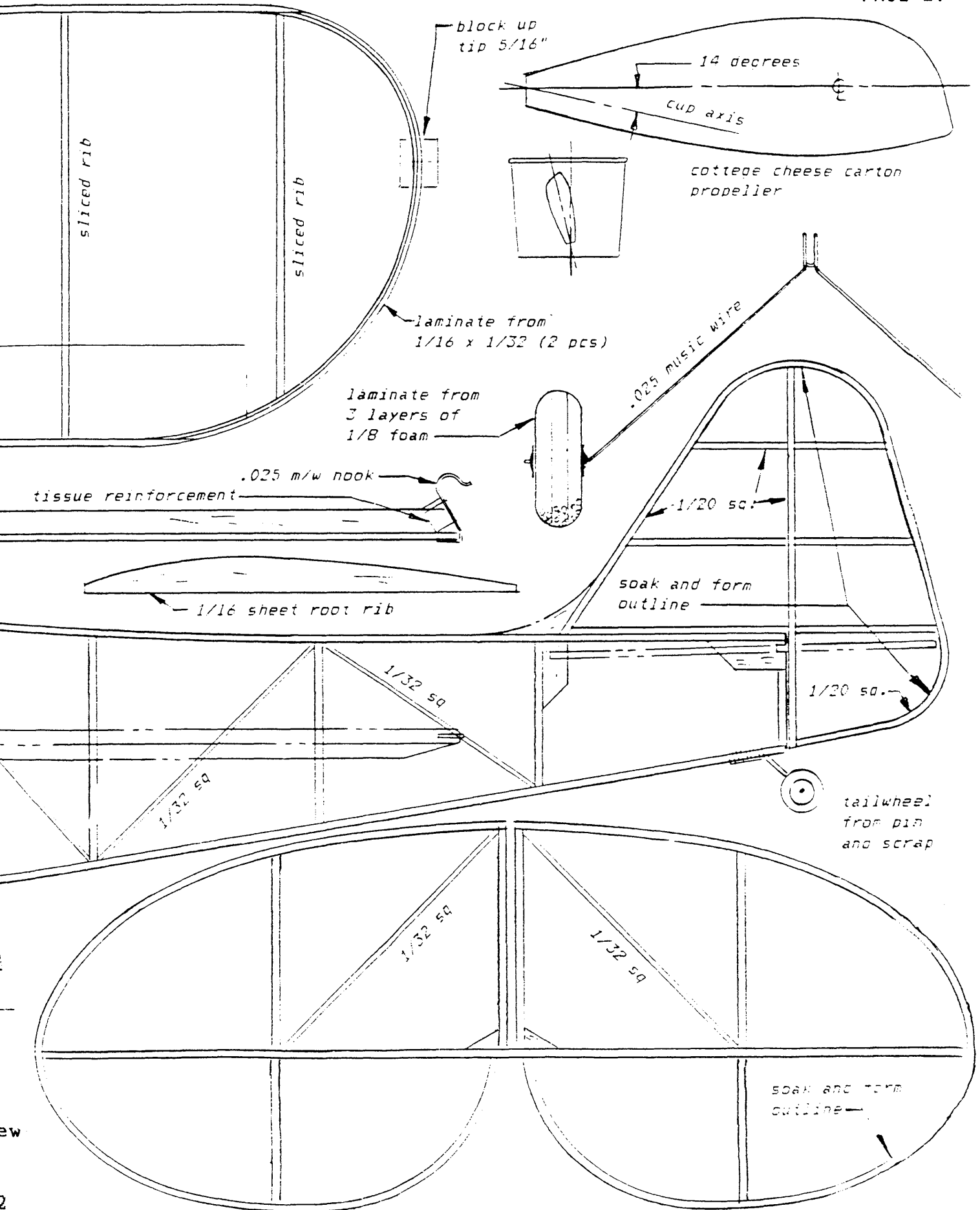
L.SATTERLEE 2/18/91

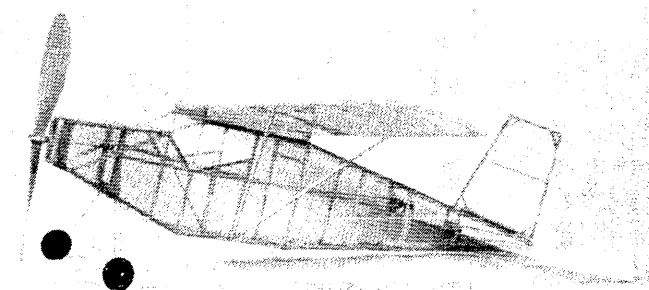
All material 1/16" sq unless
otherwise specified



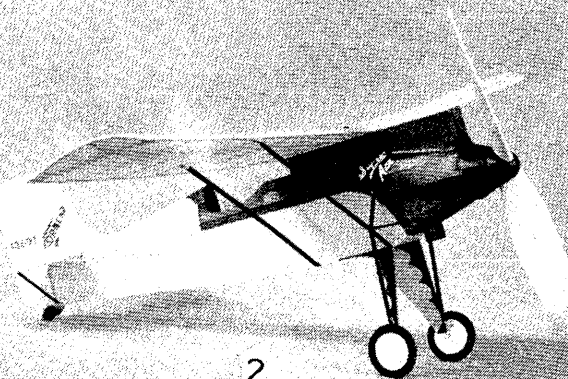
propeller hub
1/4 sq x 1"

FROM: Indoor Flight Review
Editor: Jack Textor
29 SW 58 TH DR
Des Moines IA 50312

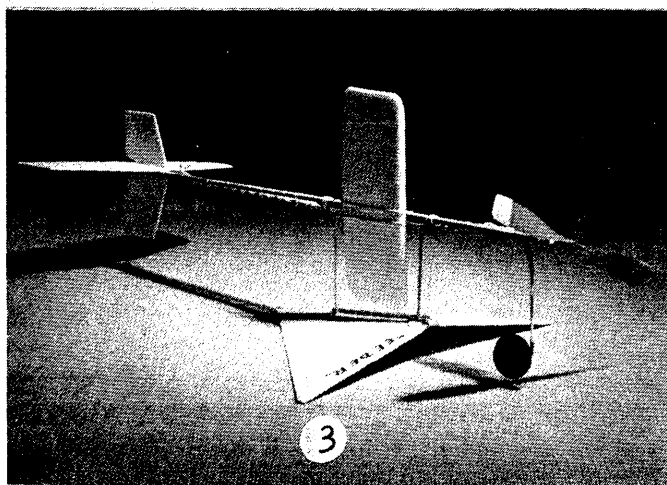




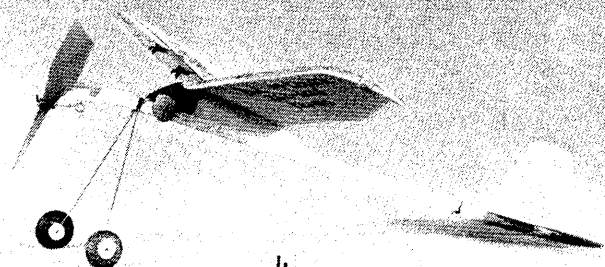
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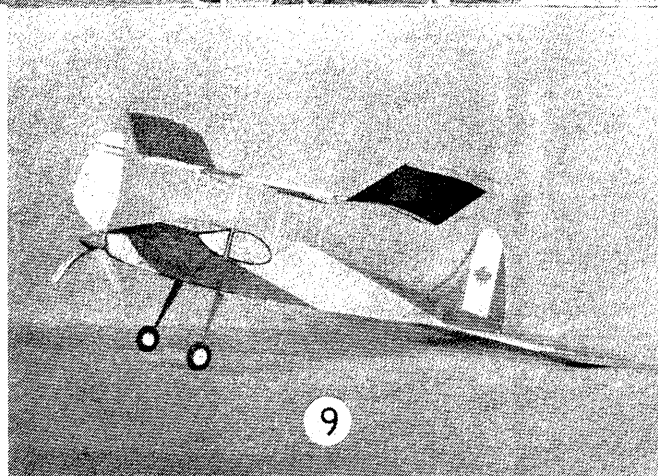
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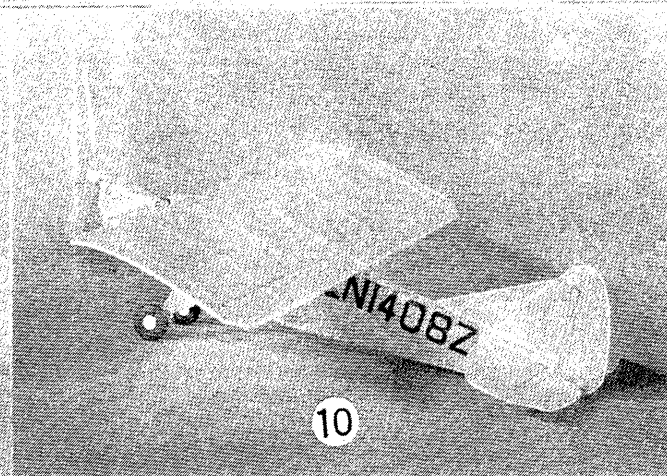
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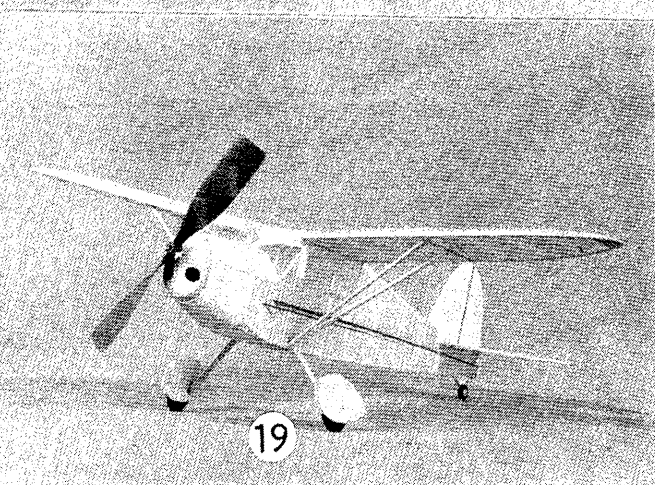
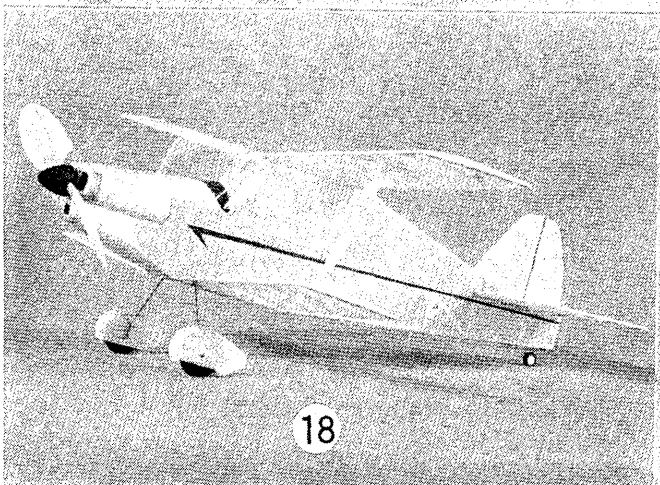
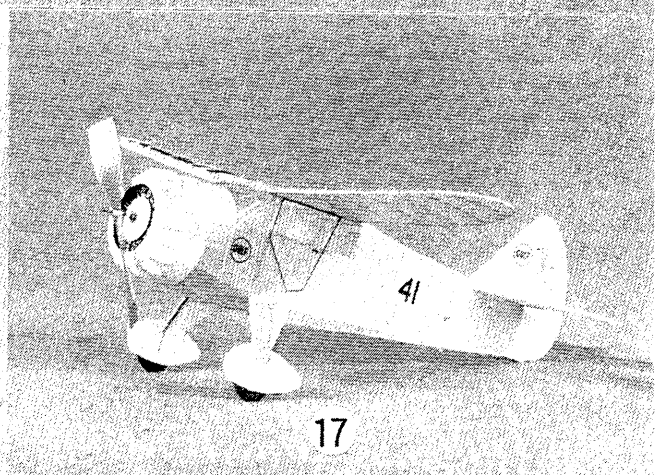
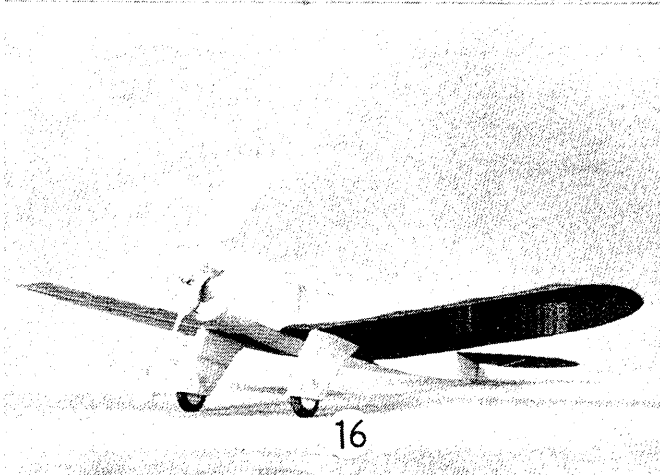
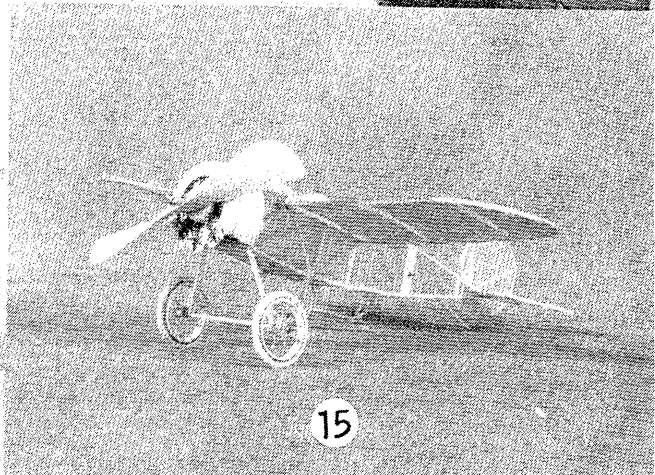
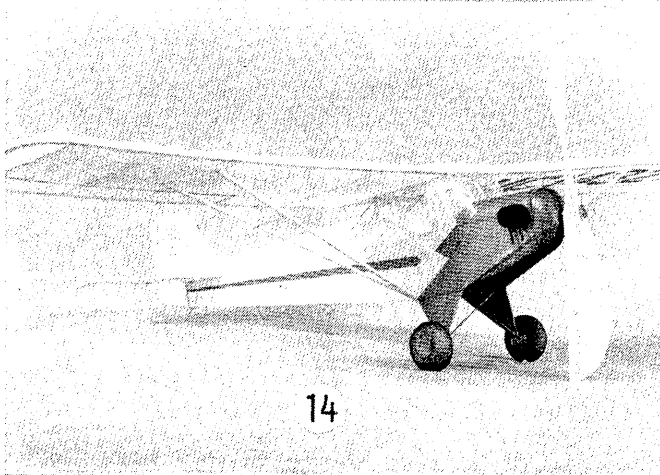
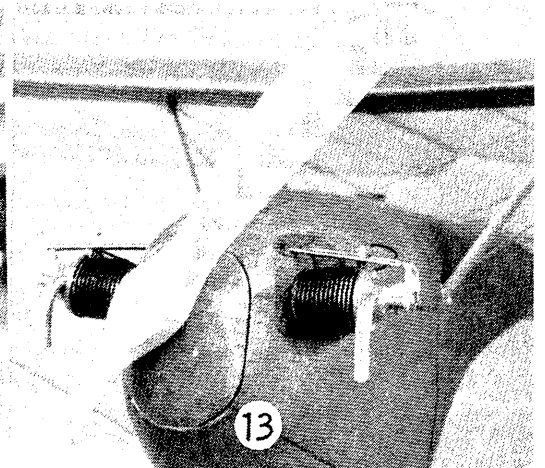
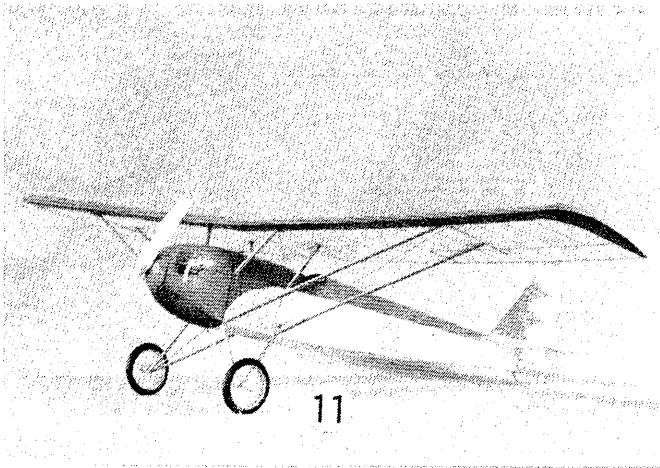
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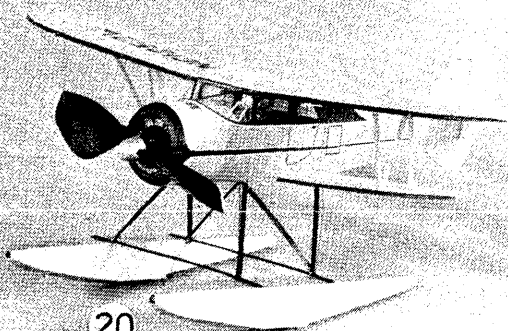


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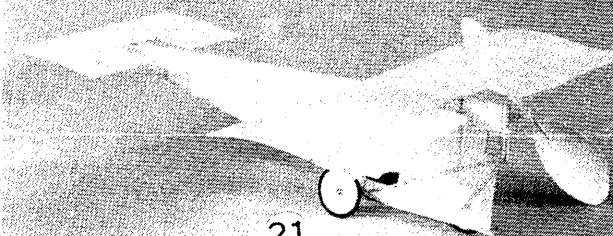


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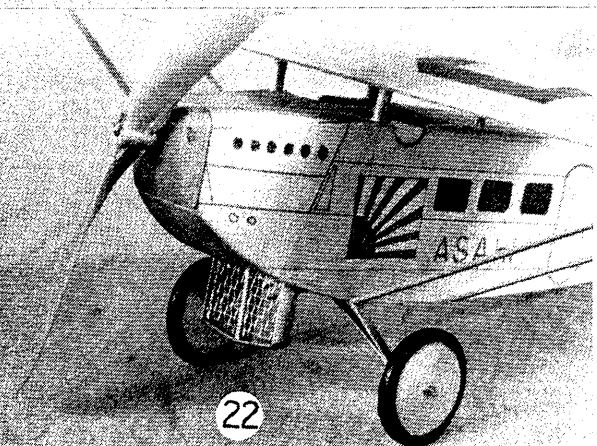




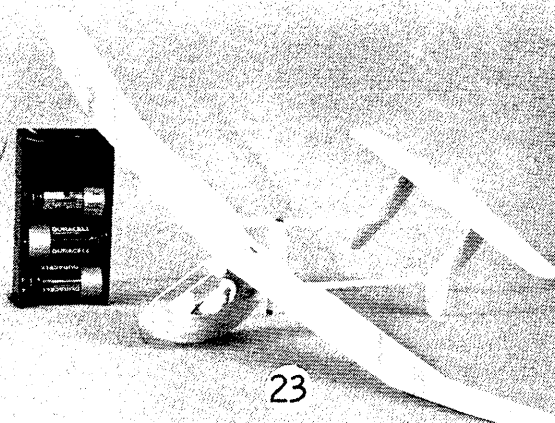
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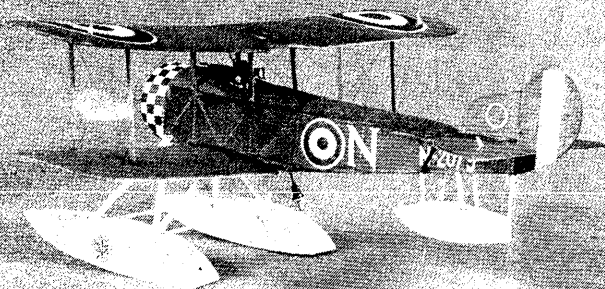
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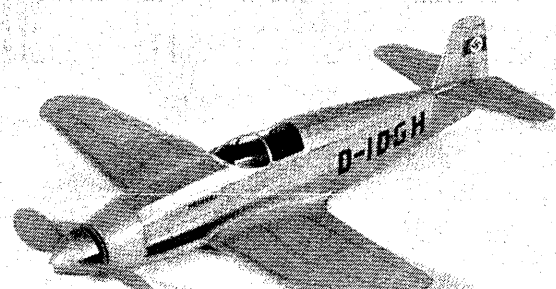
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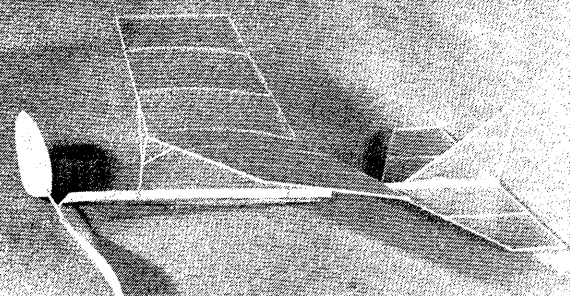
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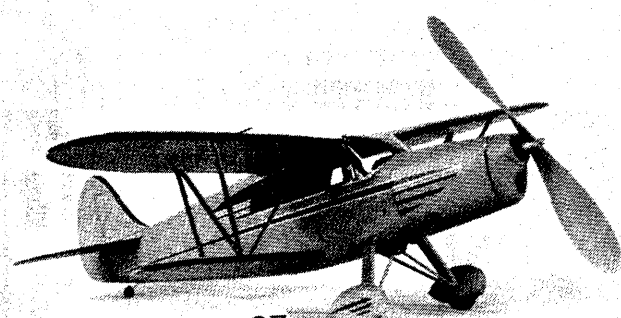
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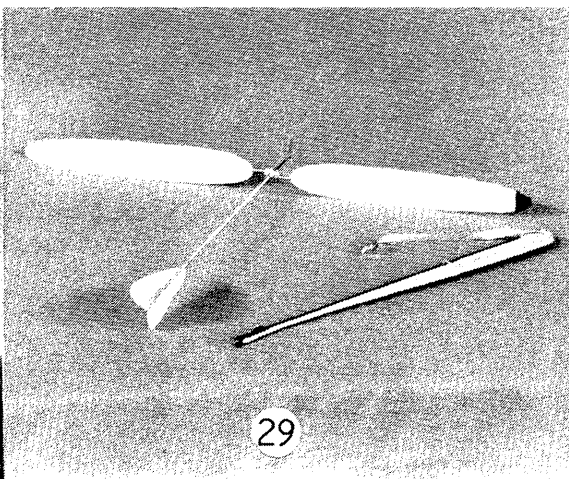
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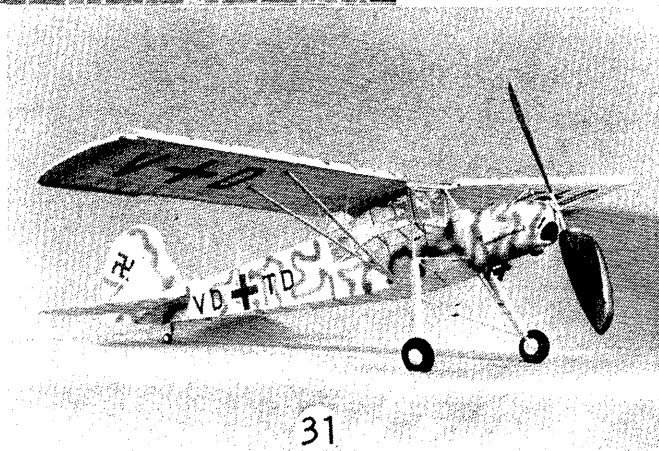
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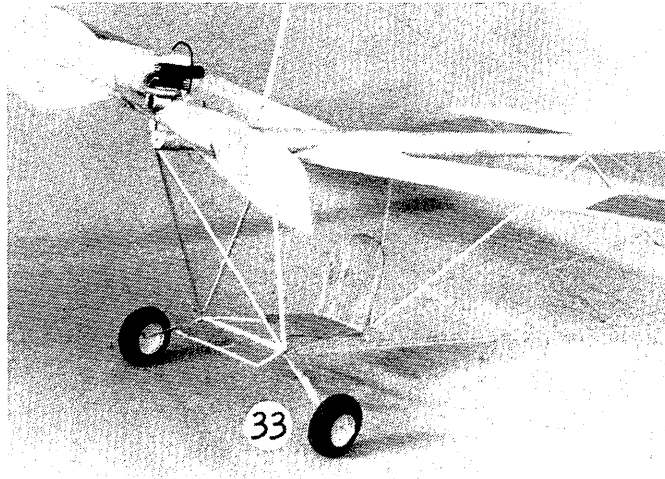
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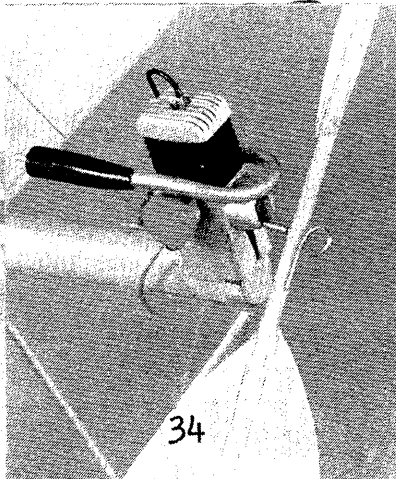
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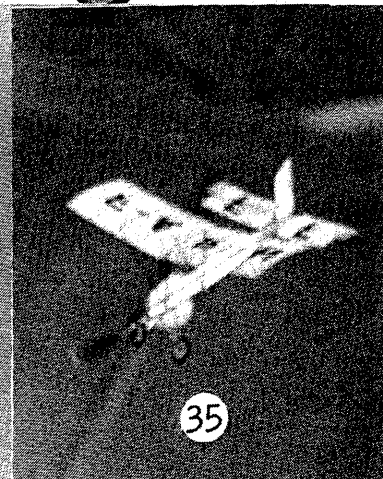
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33



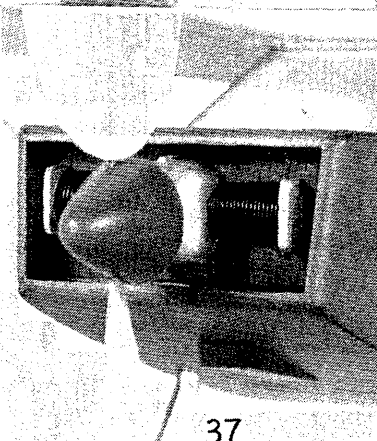
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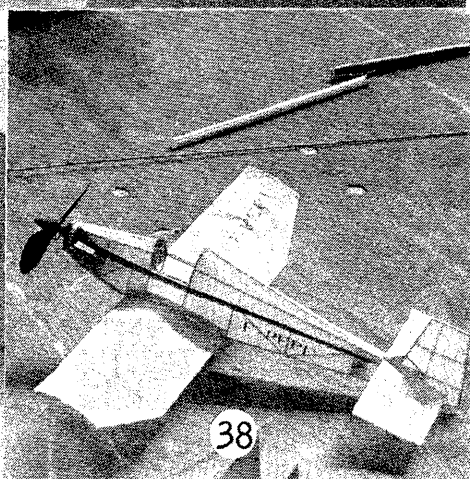
35



36



37



38

PHOTO INFORMATION (AS SEEN AT USIC/NATS '93)

- (1) Donald Lindley's BEAN MACHINE from plans April 1992 INAV. This one by Ed Seay Sr covered with colored Reynolds wrap which shows the "bones."
Now a kit by: Model Aircraft Labs
108 Lee ST
Irving TX 75060
(Telephone)
(214-438-9233)
Write or call Ed about the kits and the use of Reynolds wrap. The late Don Lindley designed this Bostonian to be simple to build to the minimum weight, as a result is a good flyer even in beginner's hands.
- (2) CORBIN SUPER ACE Kit/Plan Scale by Plenny J Bates. Not flown "official." Unofficial 1:54 which shows a clean, new, and neatly constructed model from the Golden Age kit would have a good chance in the K/P Scale event. This G.A. kit was recommended by my friend Don Lindley. It proved to be a fine kit and a good flyer.
- (3) SKIMMER speed model by Paul N McIlrath. Based on research of Dr. Alexander Lippisch in effort to develop fast fuel efficient craft for use on and over water. Man carrying prototypes were very fast and fuel efficient for the power used. Model's large vertical fin is to permit a tight turn without banking. The speeds were high but Paul was unable to get in a clean two laps without touching the floor.
- (4) FOAM RACER unlimited speed model by Paul J McIlrath. Took a second place and had the perennial winner of the event Larry Coslick bested until the last five minutes of the event. Your ever faithful editor attended USIC/ NATS '93 with Paul N (senior) and Paul J (the younger) McIlrath and they both helped with results copying and picture taking.
- (5) Paul J McIlrath and speed model.
- (6) Tom Vallee CD and timer for Speed events.
- (7) Larry Coslick Unlimited Speed winner second year in a row.
- (8) Marie Rees the brains behind Hiline electric motors at her display. Dave was busy as usual winning more than his share of scale events. Write to them at:
HILine
P O BOX 11558
Goldsboro NC 27532
They have a nice line of electric motors and accessories for electric. Cannot remember information pack cost but bet a \$1.00 bill and a SASE will get you all the information you need.
- (9) BOSTONIAN PATRIOT by John Marett of Canada. This was one of the first three Bostonians to exceed 4 minutes. John has been flying indoor since '83 or '84 and was Grand Champion USIC 1990.
- (10) FIKE No-Cal Scale by John Marett won first place USIC '87 and flown in every one since. Plan in "Winning Indoor Designs" by Jerry Nollin and Ed Knight. As permitted by rules a number of changes

from true scale were made to improve flying - Wing cord slightly reduced, Tail area slightly increased, Tail and Nose moment slightly increased.

- (11) Georgia Special by John Blair. First in AMA scale. Plan drawn from EAA reprint of 1931 Flying and Glider Manual. 1" to 1' for a 28" wing span.
- (12) John Blair Scale builder extraordinary I
- (13) Georgia Special detail of 28 H.P. Morehouse engine. It is easy to see why it took first.
- (14) Taylor E 2 Cub Kit/Plan Scale John Blair. Megow plan from Schultz. 23.5" span. Took second place to Rees Zippy Sport
Plan source: Charles F Schultz
910 Broadfields DR
Louisville KY 40207
Send him a SASE and \$1.00 for list.
- (15) Herbst Monoplane by John Blair. Walt Mooney peanut plan reduced to Pistacho. Wire wheels per John Typond in Model Builder.
- (16) Kinner Sportwing Kit/Plan Scale by John Blair
- (17) Mr Mulligan Bostonian by Paul N McIlrath. High charisma points but came in last over all. But still a good smooth flyer and does it ever look good.
- (18) Shatzle by Paul J McIlrath. Design by Paul N McIlrath, plan in April 1993 INAV.
- (19) 3/4 Sig Cabinaire by Paul J McIlrath. Design by Paul N McIlrath
- (20) Waco E Model E floatplane by Stu Weckerly. Plan written in German with Ken Johnson's name on them. Stu added the Edo floats. Peanut Scale fifth place great for such a difficult subject.
- (21) White Monoplane No-Cal by Dan Baird took 5 th place with a 4:41. From Peanut plan (enlarged to 123%) in Model Builder Oct. 1983 - Don Assel.
- (22) J-BADA Dornier built in Japan. Model by Gil Coughlin. Radiator is aluminum screen. Plan to be in Model Builder a Linstrum design.
- (23) A "Could Be" ultra light by Robert Romash. All sheet balsa surfaces and Kenway electric power. A good sport flyer and all you need for field equipment is the 3 D cell charger shown with the model. Would be a great construction feature for Flying Models, Model Builder or Model Aviation.
- (24) Sopwith Baby CO 2 by Michael Hines.
- (25) Heinkel HE 100 V8 Peanut Scale by Michael Hines. Took a 7 th which was good for a complex low winger.
- (26) TATA SMOULA kit from Czechoslovakia is like a limited pennyplane but as close as you will come to an ARF in an indoor

CONTINUED FROM PAGE 15

- model. Kit has ribs cut, motor stick with bearing and rear hook attached and the prop is ready to slip together. Could be used in one design contest or as a quick built model to demonstrate in effort to get a site. A Hobby Lobby Import this example built by Michael Hines.
- (27) Waco C8W by Michael Hines. A one of a kind built for Menasco and powered by their engine. Later owned by Howard Hughes.
- (28) Les Garber. The editor of INAV after this issue. Things can only get better for the readers.... not Les.
- (29) A catapult autogyro by Les Garber. There is no class for this but it is sure fun to watch it rocket up with folded blades and then come rotating down.
- (30) Kit Underwood one of the people who make Indoor. She puts a lot of effort into the Lakehurst flying. If you think you would like to fly at Lakehurst contact Kit and Gary at: 9 Treelawn Terrace
Mercerville NJ 08619
(Telephone 609-586-4441)
- (31 & 32) Storch by Dave Rees loaded with detail all done to perfection.
- (33 & 34) Sky Rider ultralight by Dave Robelen 40" span and only 35 grams. The struts are all balsa. Nice engine detail.
- (35) Unknown No-Cal high in the dome. The modeler who was flying this should write to Les Garber and get credit.
- (36 & 37) Cougar FAC & AMA scale by Bill Passarelle a Skyscraper. spinner of silk and papier-mache and silk contains a freewheeling latch for outdoor flying.
- (38) Jodel Bebe Peanut Scale by Chris Sydor
- (39) Tony Italiano. After years of service to the rest of us he gets to do some flying.
- (40) Le Pelican AMA & Coconut Scale by Dr John Martin. 37" span 1" to 1"
- (41) John Voorhees with his monoplane Pennyplane. John has developed and marketed a wonderful series of foam surfaced stick models. The Breakfast Special made with light wood and light foam tray material has been a good entry to indoor for some newcomers.
- (42) Double Whammy by P J Bates. Not flown at USIC/NATS but included picture of it as it is one of the feature plans in this issue.
- (43) Alco Sport Peanut Scale by David Robelen. Dave used a thin airfoil and kept the weight to between 4-1/2 and 4-3/4 grams to get flight times of around 100 seconds.
- (44) Four on The Floor.
- (45) Four Standing Up. This is really the secret of those long flights in the Mini-Dome. Get four modelers close together and there must be hot air rising.
- (46) Pistachio by Gil Coughlin. This model has had about 700 flights in all sorts of places to demonstrate indoor flying.
- (47) Piper Vagabond tail by Norman Reece. The script on this Coconut Scale model was done free hand, very nice work.
- (48) Focker D 7 by Stan Fink. Diels plan scaled down to Peanut Scale size. The color to tissue was done by hand by Stan. A color photo would do it more justice.
- (49) Swing'in Easy by Roy White. One flight of over 13 minutes recorded at Johnson City this year and had 12:52 CAT II at Flint Mich. air lock building earlier. 800 mgm, front wing microfilm, flapper wings poly micro. Very smooth it has none of the jerking associated with a monoplane with wings working together.
- (50) Jim Clem my friend the Jet Speed flyer. Jim is still getting into the record book current CAT I LPP record holder.
- (51) Penny (full) biplane by Jim Clem.
- (52) Boussard 152 H by Tom Savage. Tom did a nice job modeling this French Utility Aircraft.
- (53) Corbin Super Ace K/P Scale by Bates. Please refer to photo # 2 in case you forgot that your editor once glued two sticks together and covered them with tissue.
- (54 & 55) "I've Got A Love-a-le Bunch of Coconuts. There They Are A Standing In a Row. Big Ones Small..." Sorry, no small coconuts here, only big ones waiting to be judged. A rows of great workmanship is what you see at the USIC/NATS Johnson City TN. You should go to fly, see the great models and your friends in '94.

SUBSCRIPTION RATES

\$9.00 U.S.A., Canada, Mexico
\$12.00 Air Mail all others

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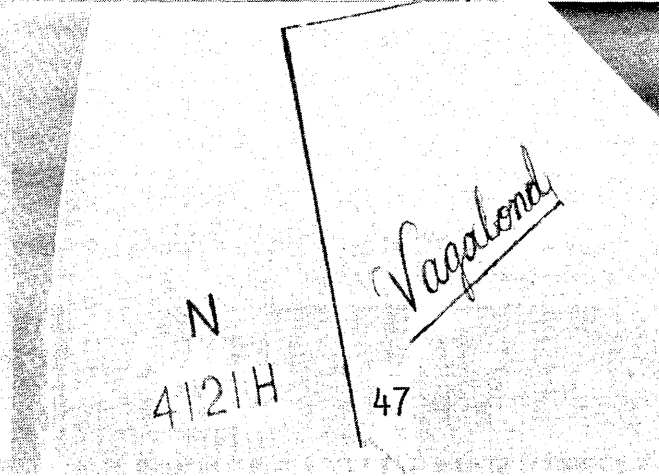
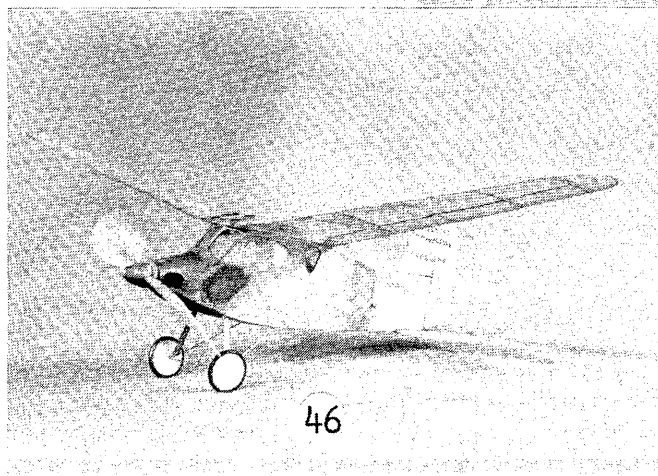
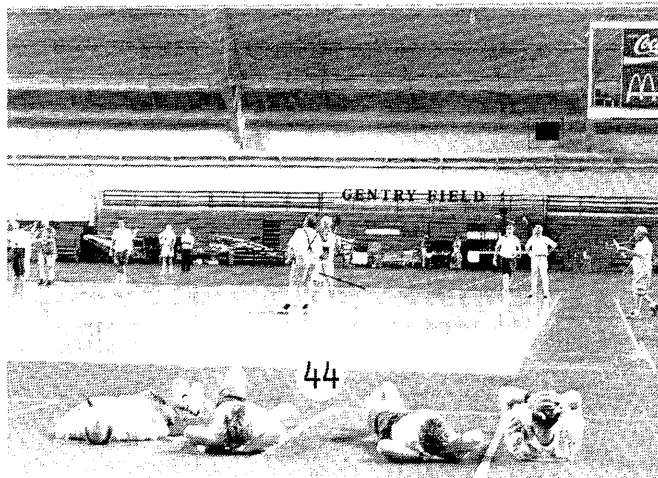
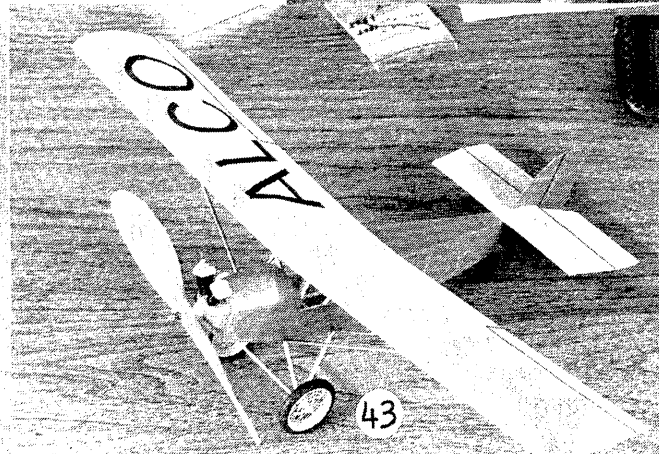
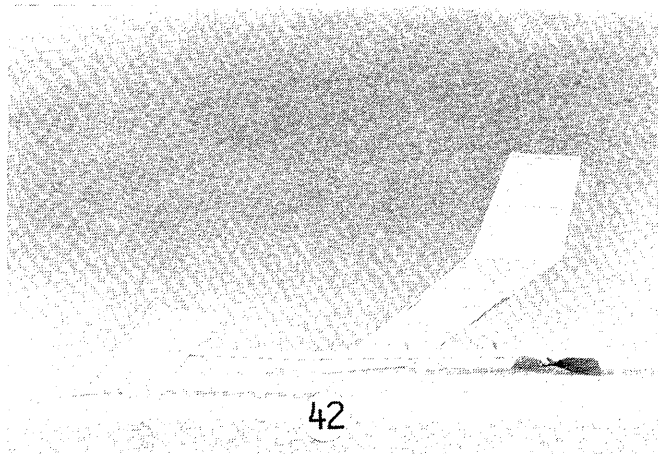
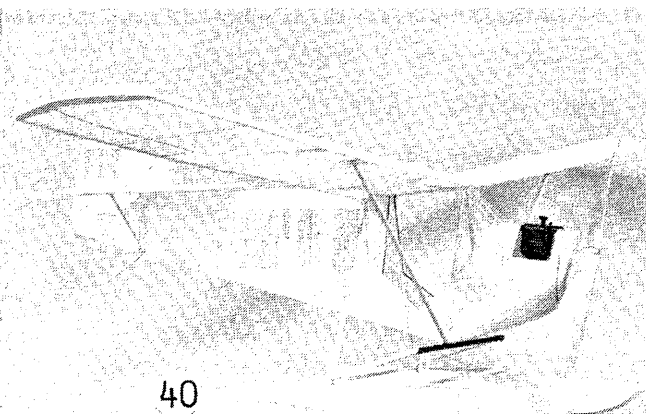
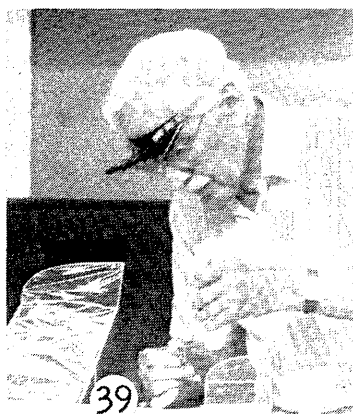
LESTER W GARBER
EDITOR INDOOR NEWS AND VIEWS
2324 EAST 5 th STREET
DULUTH MN 55812

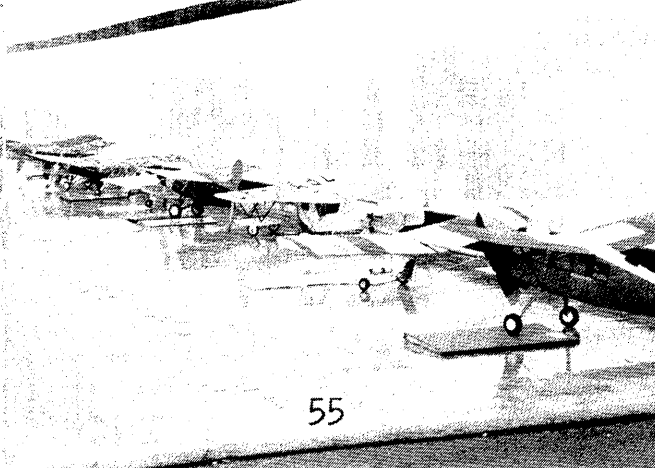
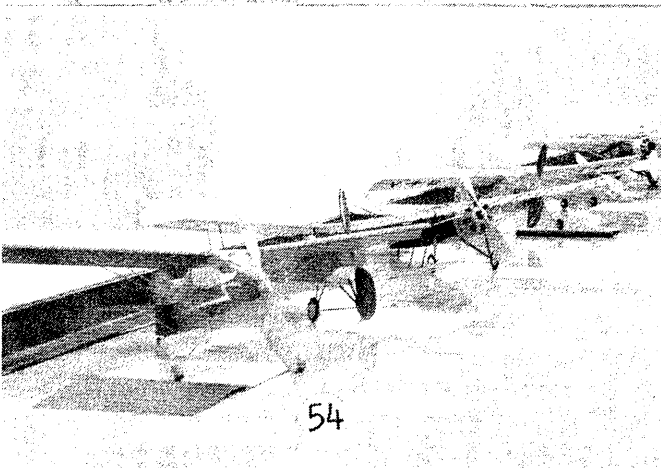
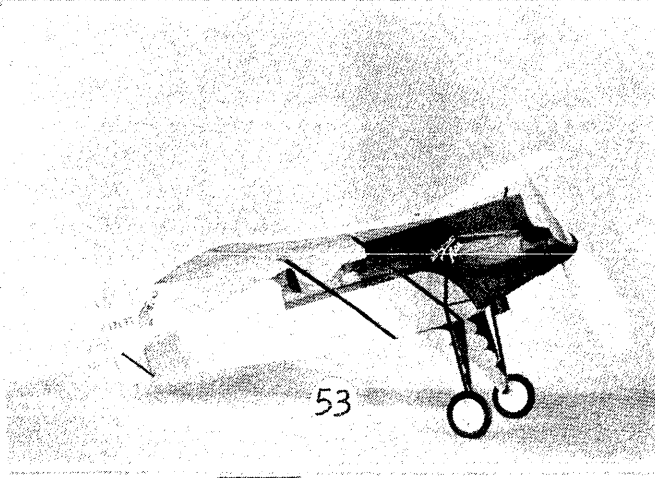
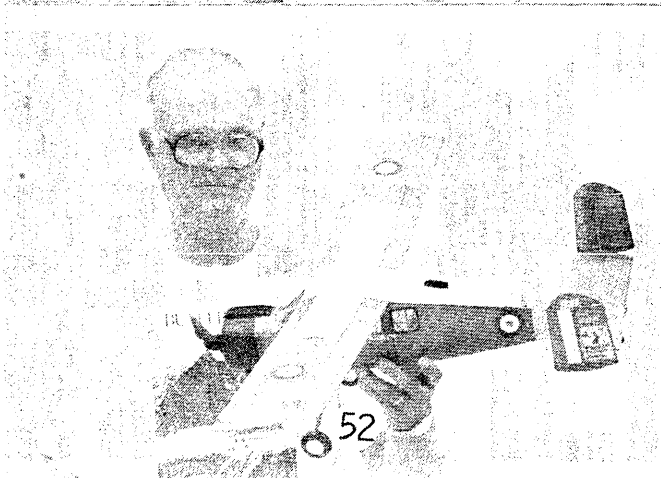
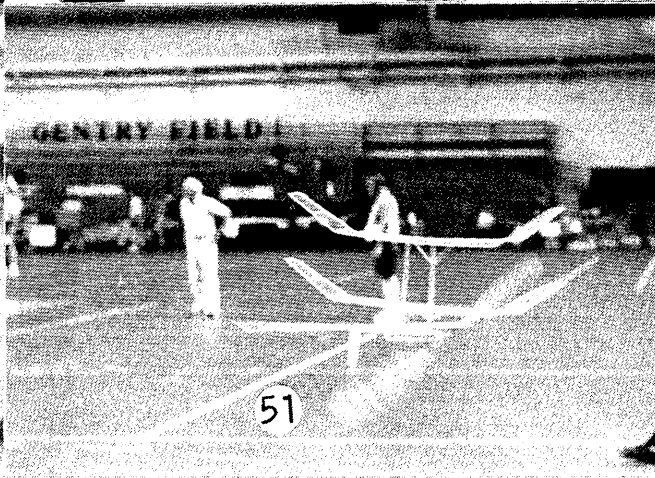
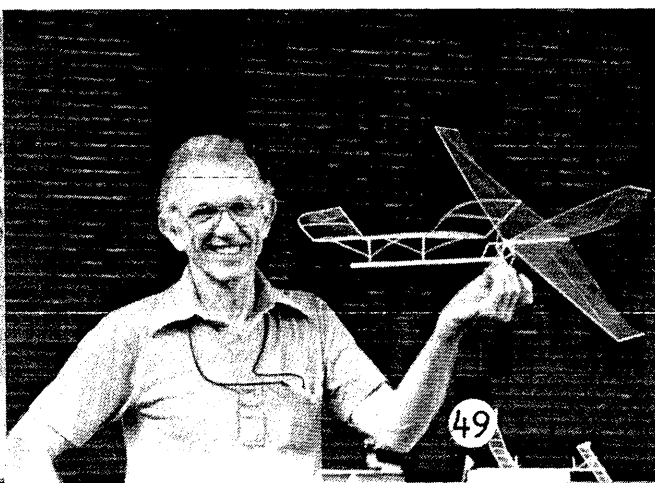
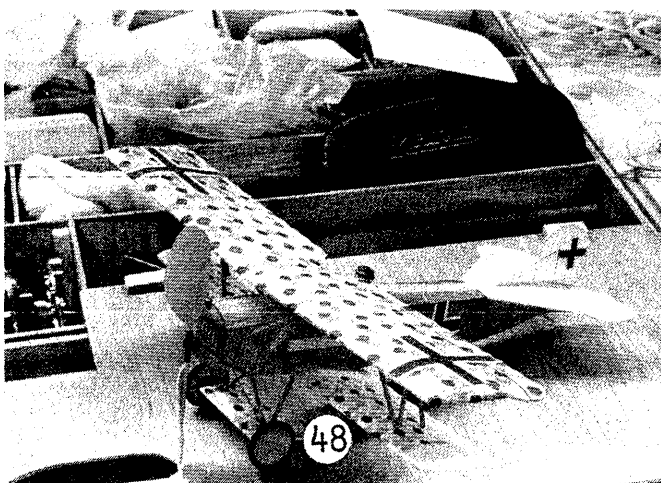
YOUR SUBSCRIPTION STATUS

EXPIRES THIS ISSUE

EXPIRES NEXT ISSUE

CHECK ADDRESS LABEL. IF # 71, 72 or 73 THIS IS YOUR LAST ISSUE. Do not depend on "RED X."





Wing Post

Note: Right wing - shorter than left

SEE PAGE 4
FOR THE DOUBLED-
WHAMMY STORY
BY CHUCK
MARCOS

JULY
1993

MATCH
SORRY
IF POINT
OF "X"
BEYOND
PAGE
(PJB)

Stick leading edge

Stick center
line (no rib)

Stick trailing edge

Raise tip 2 ft w. for
dihedral

INAV #71,72,73

PAGE 7

Raise end of tail boom 4 in when mounting

A Tail boom - 3 x 4 x 8 taper to top.

Wing root detail (A)

TOP VIEW (A) Not a barrel
for left turn

7/32" notch allows incidence
adjustment & wing removal

TOP VIEW (B)

TO NOSE
8 x 4 x 8 curve as shown

Rear post

Front post

Dihedral joint
detail

Trim away excess
after glue has dried

Cover wing before
adding dihedral

Double Whammy

Power - 12 in loop of 1/8 EAL
rubber

Fin - build into tail
boom. Cover left
side only.

Rear post offset 8 in to left
to provide proper wing incidence

Straight pin for rear
hook. Glue well

MATCH
SEE
NOTE
ABOVE

Leading Edge 1/2 in

COVERING Give wood a coat of clear dope. Place tissue over structure and apply thinner through tissue. Cover model with gift-wrap or tissue only. No film or condenser paper. Do not water shrink or dope tissue.

Raise tip 2 1/4 in. for dihedral.

MATCH

1/16 in. sheet guage

WING POST: MAKE 2 of 1/16 in. square balsa

Pin like this. Do not run through wood!

All ribs are 1/16 in. sq. sticks (no lumber).

Trailing Edge 1/2 in. C
Motor stick ~ 1/2 x 1/2 x 1/2 (no longer)

1/2 x 1/2 x 1/2 Packing for nose bearing

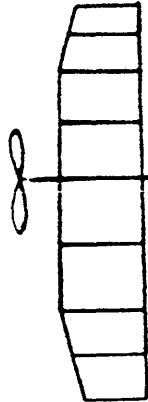


Balance Point

"AMA Cub" 5 1/2 in. prop and nose bearing assembly must be used. Available free at contest. Thrust bearing will need slight bend to left (left thrust)

All material is balsa wood. Four 1/16 in. sq. x 3/16 in. & one 1/2 x 1/2 x 3/16 in. required plus a small piece of 1/16 sheet.

MATCH



For View (not to scale)



DESIGNED BY: LARRY
DRAWN BY: JAMES
RUBBER .036x10 F
WING: 195 MG
M/S-STAB: 250 M
PROP: 130 MG
BEST TIME: 13 MIN
30 FOOT CEILING -

NO TOUCH LOW CEILING EZB

BY: LARRY COSLICK

As a personal challenge, I wanted an EZB that would post times around 13 minutes, no touch in our 30 foot site. A full sized EZB carries too much rubber and the motor stick is too long for no touch flying.

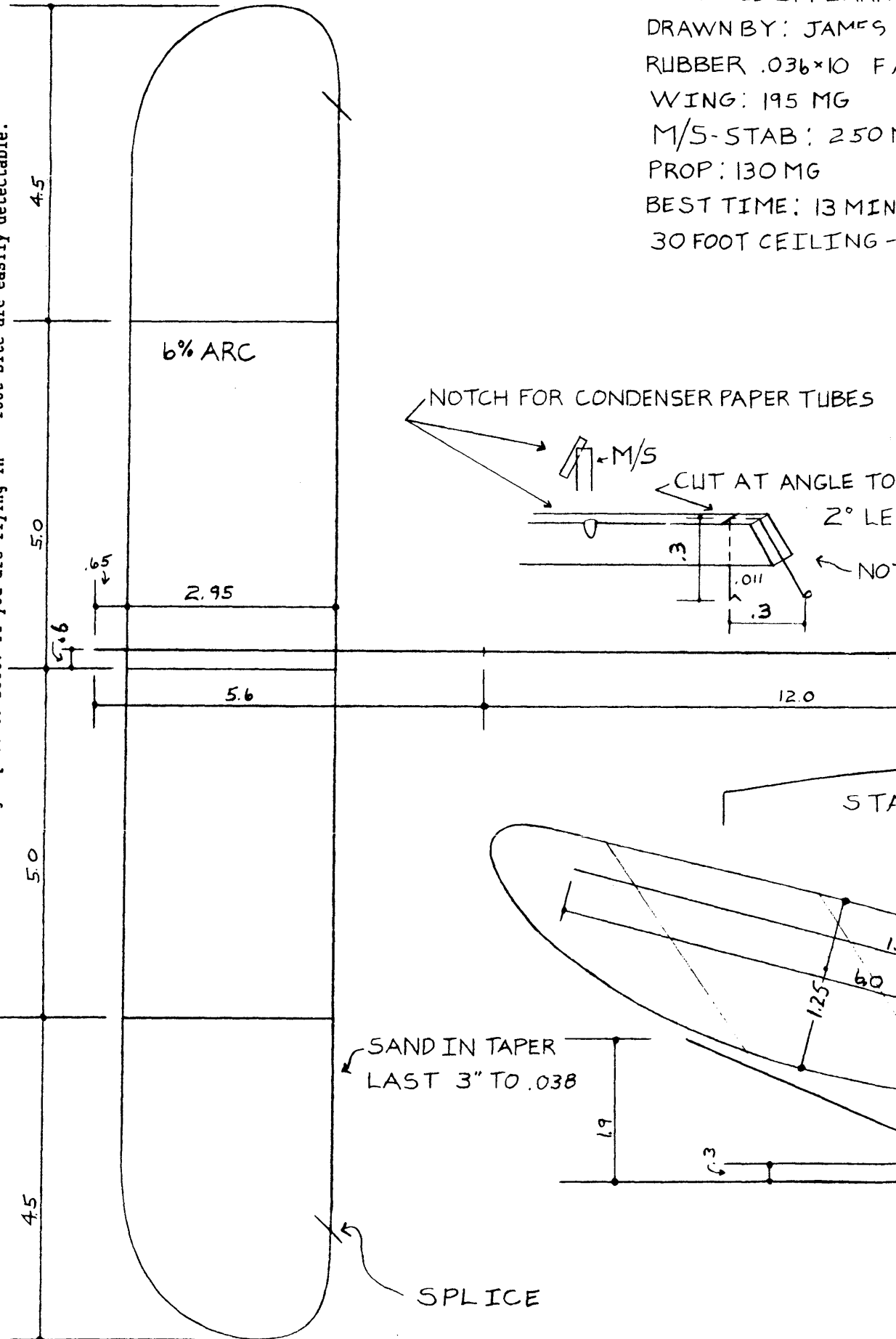
I started with a motor stick of 7 inches and finally settled on a model with a motor stick of 5.6 inches. It swings a

flaring 13.25" x 23" pitch prop and uses a loop of tan 10" x .036. At launch the prop rotates at 79 rpm with a launch torque of .09 to .11. The torque is checked before each flight with a hand held torque meter. I started with a 10" x .031 loop and worked up in thickness until the model was just under the steel and landed with less than 1/4 row of knots.

This model is competitive in ceilings up to 40 feet. If you are flying in

a site with a scrubable ceiling, a long motor stick is your best bet.

My competition model weighs .57 grams, but I have just completed one weighing .495 grams. This type of EZB is ideally suited for a no touch contest flown in rounds. The last round being 12 or 13 minutes with two attempts per round. If the model touches the ceiling in any round, it's out of the contest. Ceiling touches in a 30 foot site are easily detectable.



Y COSLICK
MERSEAL
AI TAN

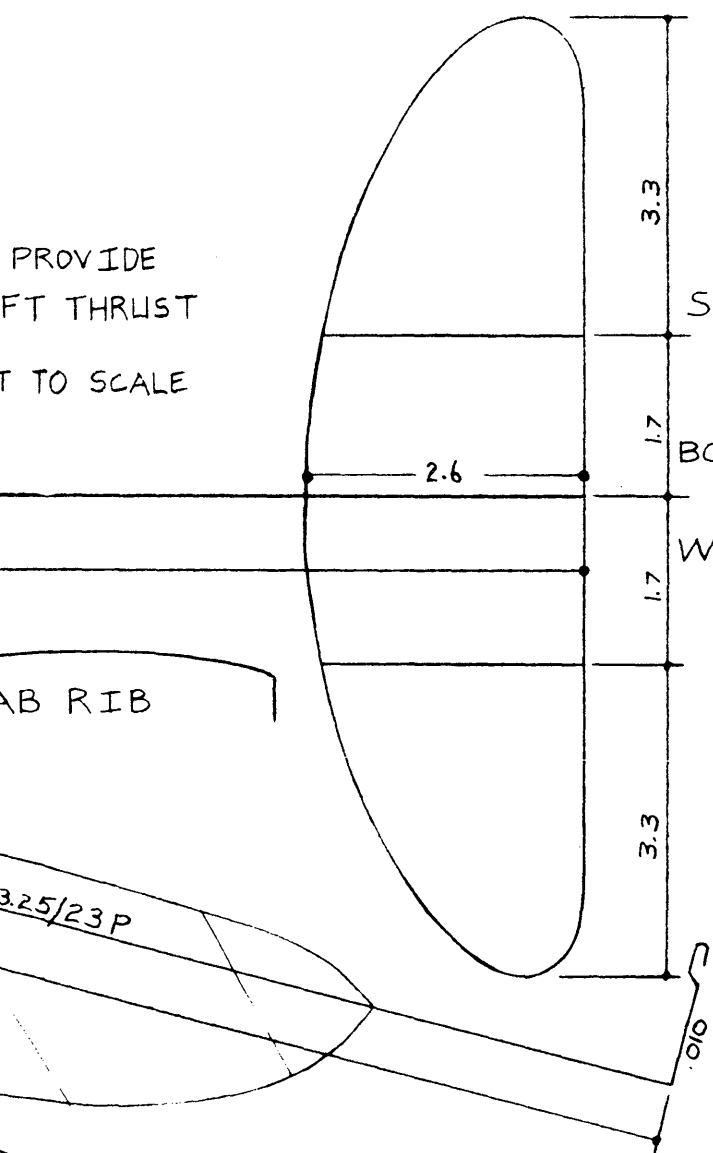
MG

UTES -
NO TOUCH

PROVIDE
FT THRUST
T TO SCALE

AB RIB

3.25/23P



PROP: SPAR CUT FROM 1MS 12" TAPERED STOCK
.040_w × .055_d AT HUB → .040_w × .025_d AT TIP
SPAR WEIGHT 25 MG - 35 MG WITH HOOK
BLADES .006 4.5 lb FORMED ON 23° PITCH
BLOCK
BLADES ATTACHED WITH THINNED
CARPENTERS GLUE

WING: L/E SPAR .029 × .058 10.5" LONG 6.75 lb
T/E SPAR .029 × .045 18" LONG 6.75 lb
L/E TIP .022 × .058 → .022 × .038 9" LONG 5.25 lb
SEE WING OUTLINE FOR T/E TIP
TAPER

RIBS .018 × .045 4.5 lb

WING DRY 105-110 MG

STAB OUTLINE: .022 × .032 4.5 lb

RIBS .018 × .032 4.5 lb

STAB DRY 20-25 MG

BOOM: .055_w × .080_d → .045_w × .040_d
12" LONG 4.0 lb

WING POST: .049 ROUND 1.3"

M/S FRONT .080_w × .120_d

CENTER .080_w × .155_d

REAR .065_w × .115_d 5.6" LONG 4.0 lb



nffs
NATIONAL FREE FLIGHT SOCIETY

3"

REAR VIEW

V-STAB

.6 OFFSET

INAV #71,72,73

JULY 1993

BOST•O•BIPE

SPURT BOSTONIAN
FOR FUN IN LOCAL GYM,
NOT WINNING THE UAC.

BUTT TO BODY

WING TO BODY

COVER TOP ONLY

TE
1 1/2" x 1/20" STRIPS
LE + TE @ TIP

WING P/B SLICED 1/32

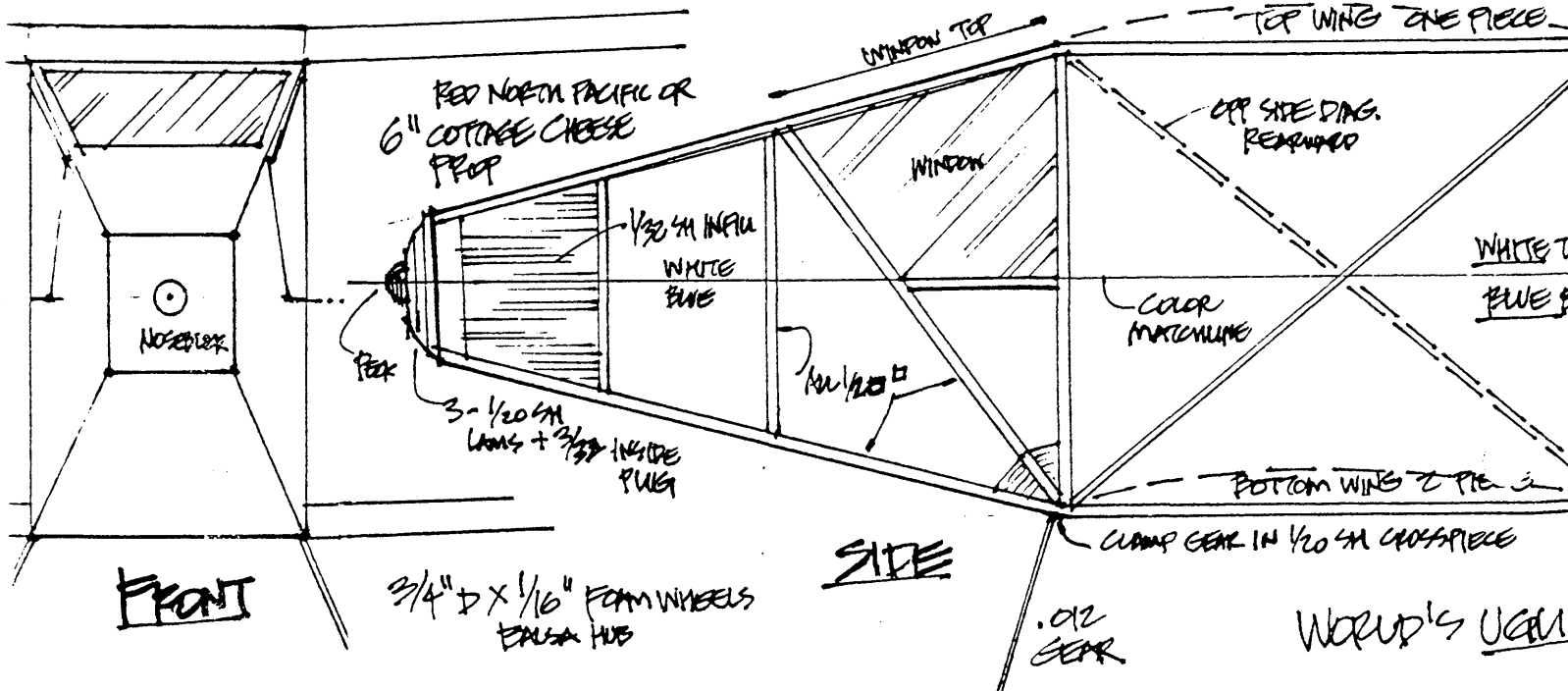
1/20" HD

ALL 1/32"

ADJUSTABLE

STAB

NOTE! ALL SURFACES COVER BOTH SIDES PER AMA RULES NOTE PATRIOTIC P/W/B COLOR SCHEME



JULY 1993 1/16th HP

INAV #71,72,73

PAGE 19

1/32 SUCKED TO AIRFOIL

WHITE TOP WING
BLUE LOWER

2 1/4" x 1/20" D LATE STRIPS

1/20th

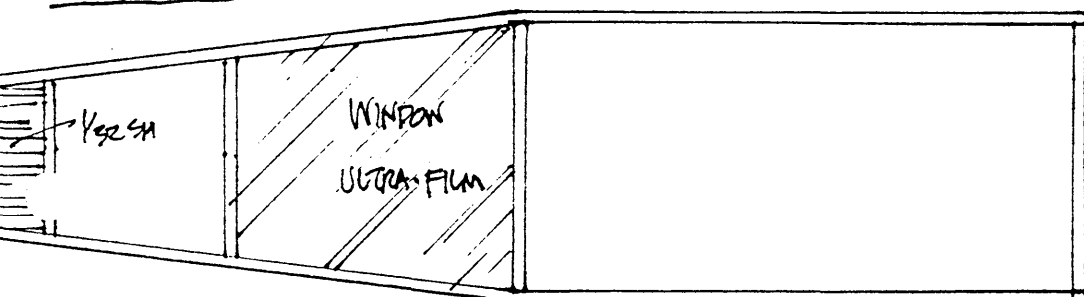
BIPLANE WINGS

1/4" DIRECTIONAL EARTH T & B

FULL SIZE PLAN

SCALE 0 1/4 1/2 1 2 3 4 5 IN

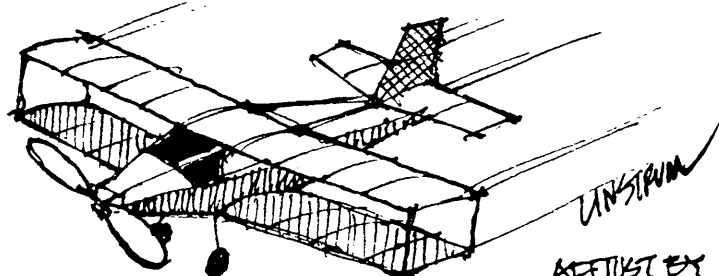
LOWER WING HAS NO CTR SECT.



THREE TO POINT C TAIL

TOP

TRULY UGLY!



UNSTRIP

ADJUST BY SHIMMING STAB TE AND TWISTING FIN OFF GE

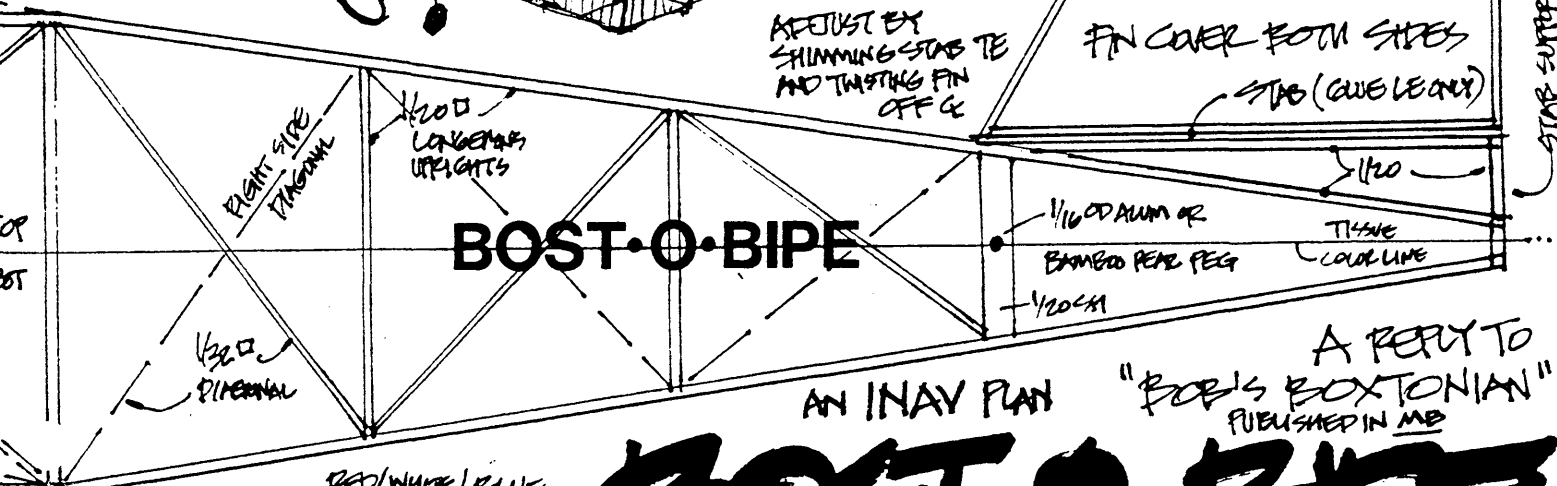
RED FIN

FIN COVER BOTH SIDES

STAB (QUE LEAN)

STAB SUPPORT ON C ONLY

BOST·O·BIPE



AN INAV PLAN

A REPLY TO "BOB'S BOSTONIAN" PUBLISHED IN MB

BOST·O·BIPE

BEST BIPLANE!

RED/WHITE/BLUE TO BOSTONIAN MAMA RULES INDOOR ONLY!

© 1989 DAVE "VTO" UNSTRIP FULL SIZE PLAN

BUILDING NON-BANANA FUSELAGES

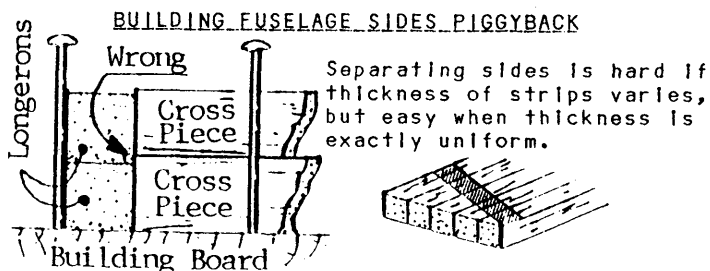
and other things the old guys think you know

First use A "grain" sheet for your strips. "C" should not be used for three reasons. First, the resulting strip is the same as a strip from "A" turned 90 degrees. Second, strips from "C" will have more variation in weight. Actual example from "C" sheet consecutive .062' square strips (grams) .104-.095-.094-.093-.095-.097-.098-.131-.118-.107. Note the variation of 40% with 33% between adjacent strips. End to end variation may also be greater. Third, in sawing balsa the yield of "C" sheets is low. There is no reason to use this rare stuff in places where "A" cut is the same or better.

For models with bent stringers in the fuselage try the following. Mark on the face of the sheet at one end with a colored pen. If the mark was at an angle or if you place a color code on face of the sheet where the strip is going to come off you will be able to identify adjacent strips that can be used for opposite (L-R) longerons. The marks also tell you the "grain" orientation of each strip. Build the fuselage sides with the "grain" in the same orientation. With this control of "grain" (stiffness) and weight (stiffness) when you pull the nose and tail ends together you will not get the "dread banana shape."

Building identical sides is easy. Just build one on top of the other using vertical pins or blocks as a jig. I use thinned DUCO as one wants to use a cement that can be made soft with solvent in case you use an excess. A little cement between the sides will not hurt. Also, all pieces must be of the same thickness measuring from the board. So when building with all parts cut from the same sheet the marked face is kept "up." If longerons are cut from one piece and verticals or "X" bracing from another use a precision stripper (Harlan, Jones, or Andrews) and set pieces so the fixed dimension is vertical to the building board. If you mix and match the sides will be interlocked and razor blade separation will be difficult at best.

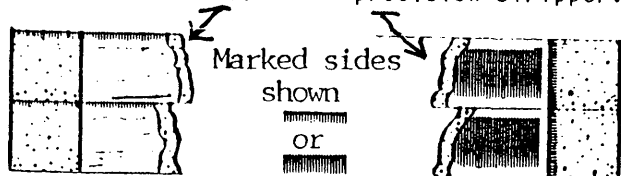
"Grain" in balsa is the radial medullary rays. Balsa grows to 24-30 inch diameter in only six years so the growth rings are one to two inches apart and are very hard to see. This has been lifted from Meuser, Lindley, and McIlraith as I have never had an original idea. - P.J.B.



Before stripping, mark one face of sheet with felt tip pen, then orient marked sides of strips as shown when building.

When all sticks are cut from one sheet:

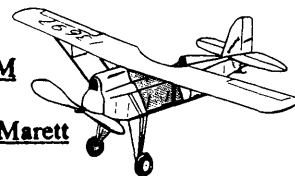
If strips are cut from different sheets using precision stripper:



MORE FROM SAM 86 SPEAKS

INDOOR TRIM

A letter from John Maret



Dear Dan:

I had an idea cross my mind today and as usual scribbled down my thoughts to possibly stick into MAAC Magazine. But then I remembered you asked for a bit of input, so maybe this will work for SAM 86 Speaks.

This is pretty simple beginner stuff, but it seems the R/C guys just don't see warps and beginners won't, until they get pointed out to them. Anyway, here it is:

Whenever we visit another beginner indoor flying session I notice again the one problem that causes more reduction of flight time than any other. It's not caused by poor rubber, but is often caused by weak construction or tight covering. It is drag, perpetrated by far too much decalage (the difference in incidence between the wing and tail surfaces.)

Theoretically a model should attain it's best flying condition when the decalage is zero. Unfortunately this rarely works with indoor rubber models because the propellor thrust line will always be a factor, and so will both the centre of aerodynamics and the centre of gravity. These factors must be in balance.

So what do you do? Well, one thing an indoor model needs is good recovery after hitting the rafters. This can be done in two ways - by moving the wing forward while reducing wing incidence, or by giving a little negative incidence in the stab. The first works well on the very light models such as EZB's, but the latter is more effective for No-Cals, especially short-coupled models like the Fike. Unfortunately, the instant you up that tail the model stalls out and you have to add weight to the nose. But one thing I learned a long time ago - the model that is balanced properly, with the correct angles of incidence, even though overweight by a bit will get far higher times than it's light-nosed stalling cousin. The reason is because the model is producing maximum lift for minimum drag throughout the flight range.

Another thing, remember that whenever the model flies nose up, the propellor has to work harder, and therefore is slowed down. Those slower turns leave extra usable turns in the air, again producing higher flight times. This is why you don't want a long nose dive off the ceiling. Valuable turns and time have been lost. Try to make the recovery as fast as you can, and always try to get that tail-down attitude through the whole cruise.

I think everyone can easily understand this, but then we come to the real problem. With newcomers the flying surfaces are weak and usually warped, often times so badly that in

CONTINUED ON PAGE 25

CONTINUED FROM PAGE 24

flight the wings flare open at the tips by 10-15 degrees. This is wash-in to the extreme, and it's deadly. The model will usually fly, but it takes an awful lot more power, and the time in the air is drastically reduced. The temporary solution would be wing braces (front and rear) to get the wing to hold it's correct angle of incidence all the way out to the tips, but the best thing would be a new, stronger wing.

The interesting thing about wing twist is that if the wing tips are twisted down ever so slightly (wash-out), this helps to keep the model from stalling and is particularly effective in low wing scale models.

I guess my real advice to the new flyer is, when building very light aircraft, don't sacrifice the strength of your wing for weight. Cut the weight out of the tail feathers, motor stick and prop. Keep the wing straight, with enough strength, and you will be rewarded with a model that is far easier to adjust, and is capable of much better flight times.

John



WE KNEW THAT

To reduce the production of CO-2 the effect of investment in energy conservation is about seven times as effective as investment in nuclear power. Each \$1,000 invested in nuclear displaces two metric tons of CO-2. The same amount in conservation displaces almost 14 tons of CO-2. Indoor flyers have long known the importance of energy conservation.

THE WAY IT WAS

One of the joys of editing INAV has been the flow of interesting letters. A recent one from Joe Hervat, Kenosha WI, was most interesting. Joe relates that he clearly remembers the "Golden Age" of aviation when attempts were made to fly oceans and speed record attempts were common. Joe was aviation struck and attempted his first model from wooden crate material. It would "fly" as far as he could throw it. His first contest was 1926 or 27 and as the youngest kid there did quite well with his twin pusher to take 3rd place with time of 65 seconds. Later met a manual training teacher who had a "commercial" fuselage model. The major material was split bamboo and the workmanship was first rate. This encouraged Joe to always do a good building job. Times were difficult (great depression) and as a result he attended meets in St Louis, Indianapolis, Akron, Cleveland, and Detroit by hitchhiking. He considered it a thrill to meet Frank Zalc, Carl Goldberg and others at these contests. I would like to thank all of those who have taken the time to drop me a note. It has contributed greatly to making my tenure as editor more fun than pain. -- P J Bates

PHOTOS IN THIS ISSUE

All of the photos in this issue except the one of Paul N McIlrath's speed model were taken in a rather mechanical way by your trusty editor. But I did have assistance of the first order, Bob Clemens photographer for Eastman Kodak and model builder. Bob shot the World Champs / USIC / NATS at J.C. for Model Aviation a few years ago so his advice was the best. The following is a summary of his recommendations. Black and white use Kodak T-Max P3200 and shoot it at 1200. For color use a FAST Kodak color film. If you do not do your own processing seek out someone who knows how to develop and print black and white. For still subjects stop down as far as your camera will go (in my case F 22). This will mean long exposures 1/4 to 1/2 second so a tripod must be used. Use a incident light meter if you have one (I did as Uncle sent me to Viet Nam the home of inexpensive photo equipment). If not use the meter in the camera and read from a Kodak GRAY card rather than the subject itself. Use reflectors to get light under the wings. I used 14" x 24" cardboard covered with aluminum foil dull side out. One was set on either side of the model slightly toward the camera. Also used a reflector in the shot of Kit Underwood. And it came out well in spite of shooting almost directly at one of the banks of lights. Contrast that (what a contrast) with the one of Jim Clem where a reflector was not used. Used a tripod for all shots but those of people had to pick shutter speed up to 1/30 second. Bob would use some high quality background for the models but I used cotton diaper material one white and the others dyed gray and black. The background was tensioned to prevent development of "waves" that would show in the photos. This and the generally flat lighting took care of the problem. I want to thank Bob for the letters and time on the telephone trying to make a photographer out of me. I did learn the truth of the adage "good photographs are created not taken."

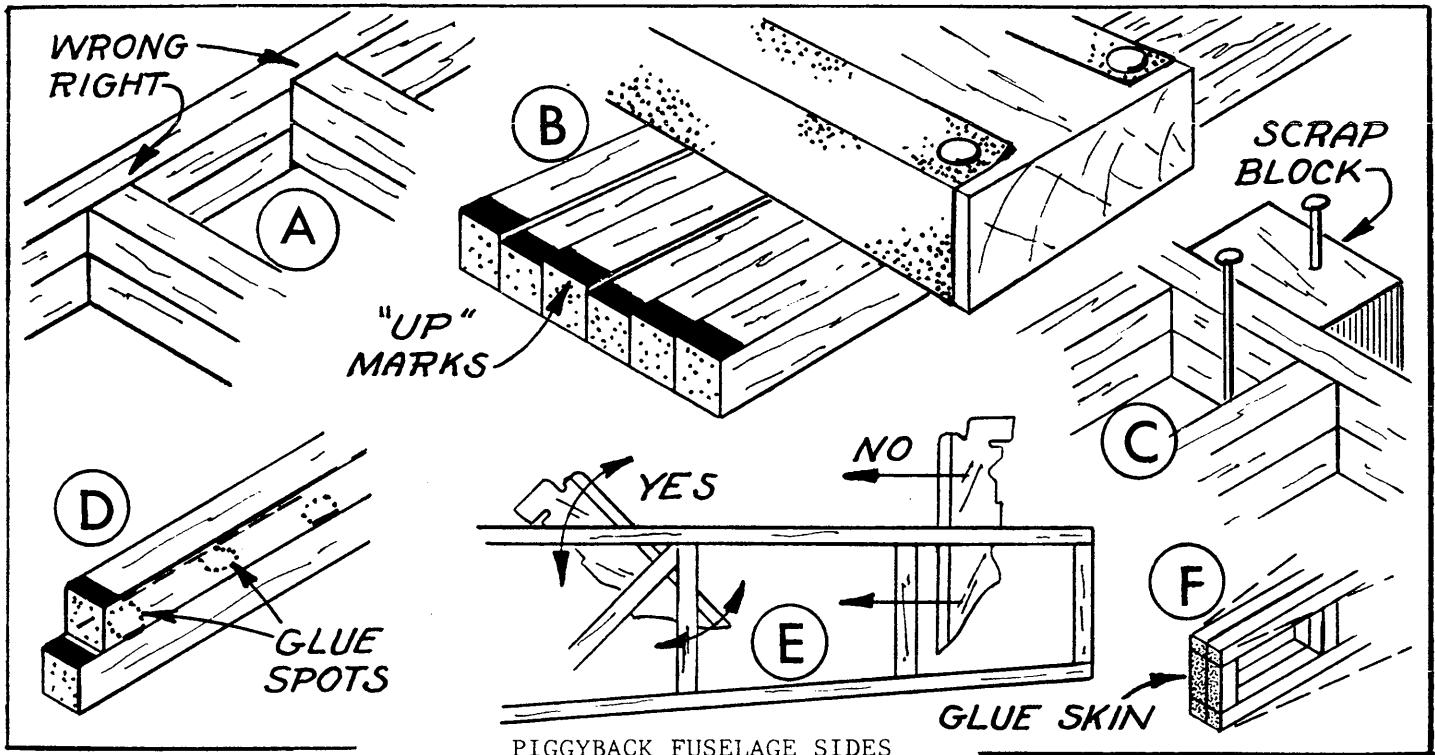
Cockpit Windshields Aluminum Cowlings

Jim Jones suggests carefully looking at the clear plastic jelly containers you get in restaurants and the plastic bubble packs for markers and other products as a possible source for windshields. The very thin aluminum pan with a peel off top that some places use for jelly may be useful as WW I Peanut scale cowlings.

GOOD LOOKING BODIES

Paul N McIlrath

An expansion of "Building Non-Banana Fuselages" seen on page 24. Yes, I know INAV subscribers know all this but you do keep that file for your new people don't you?



PIGGYBACK FUSELAGE SIDES

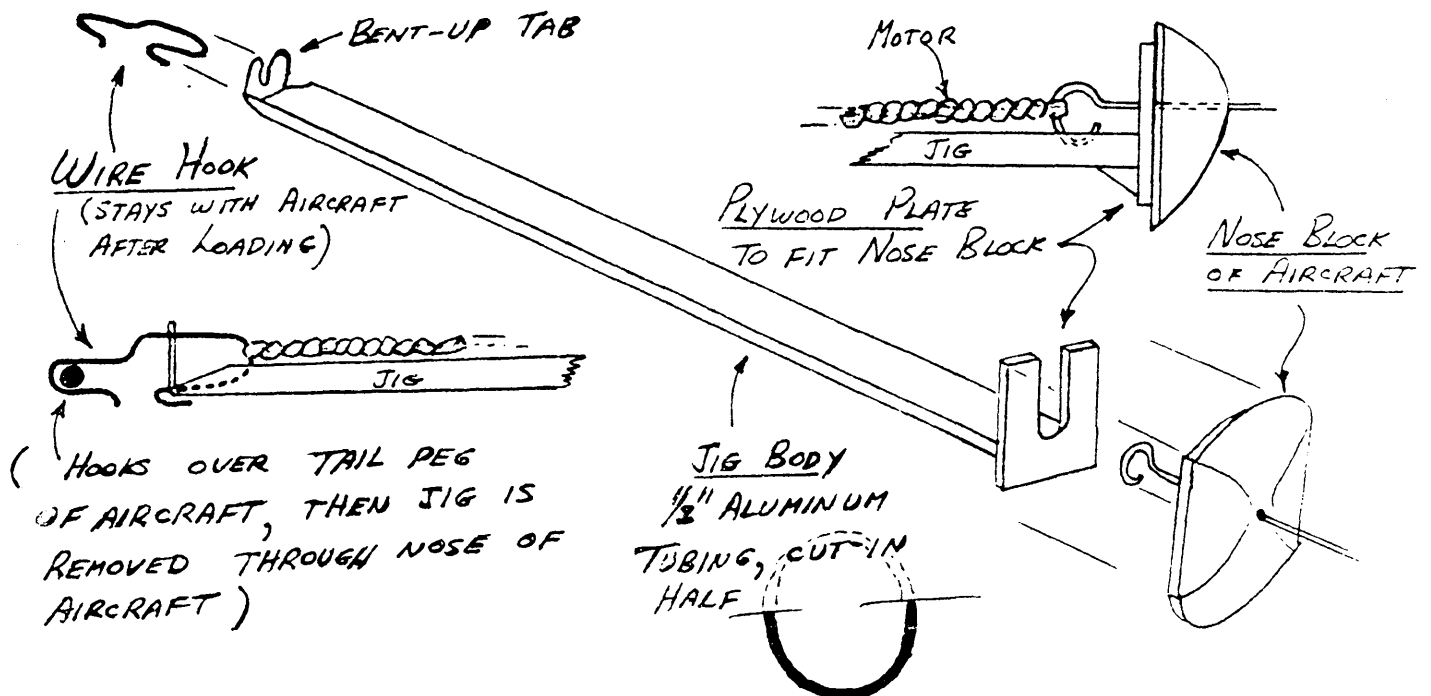
This procedure produces 2 precisely matched fuselage side frames in one operation. It is an expansion of Plenny Bates' method described in a recent INMARC Newsletter. Separating the frames is easy if the interface between them is kept perfectly flat, with no steps or offsets at the joints. See A. Two things are required to do this: all balsa strips must be EXACTLY THE SAME THICKNESS & the building surface must be flat & FIRM. -1- Scrape all glue blobs and other lumps from your building board. -2- Lay enough strips for the entire fuselage on the board, side by side. Mark the top surface with a felt tip pen. See B. Block-sand the surface enough to be sure all the strips are exactly the same thickness. Keep MARKED SIDE UP during assembly. -3- Spread plan and wax paper on the board. FLAT — No spongy spots. A fog of spray cement helps. Clamp down creases etc. with balsa scraps and pins. -4- Pin frame outline strips over plan, two deep. Position strips with scrap blocks (1/8 thick for 1/16 longerons, for example.) See C. -5- Lightly tack glue remaining strips together in pairs, marked side up, using tiny glue dabs roughly 1" apart. Remember, these joints will have to be separated later. Glue lightly — Duco, Sigmant, etc. — NO INSTANT GLUE. See D. -6- Cut uprights and diagonals from the tack glued strips and assemble just like a single frame. Be sure all parts are flush at the joints. REPEAT: No instant glue. -7- When glue is thoroughly dry, remove double frame from the wax paper. Sand outside surfaces smooth before separating. If any joints are not flush, repair them. -8- Separate the frames with half a double-edge razor blade. Slide it into the crack between the longerons & ALSO BETWEEN THE UPRIGHTS. Use the cracks to guide the blade & hold it flat. Always approach joints with the blade at an angle, and guided by 2 or more members. See E. Slide and wiggle the blade along — don't twist or pry. If you hit a stubborn spot or start to slice into a member, withdraw the blade and work toward the spot from another direction. Glue a partial split together after separation. -9- Fuselage assembly bonuses: Identical sides make the assembly of an accurate fuselage box much easier. With the 2 separate frames aligned, spread a glue film on the rear surface of the tail posts to form kind of a hinge. When front ends of the frames are spread apart to install cross members, the sides cannot shift front-to-rear. See F. The tack glued strip material can also be used to cut identical top and bottom cross members.

THREE CONNECTIONS FOR BETTER MODELING

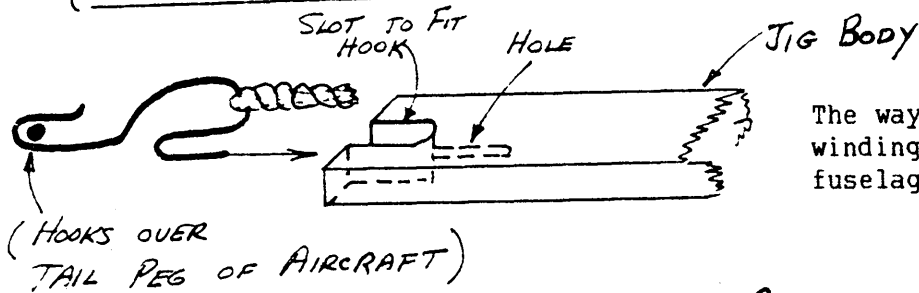
Hannan's Runway, Box 210, Magalia, California 95954 has a frequently updated loose-leaf catalog that's particularly strong on hard-to-find books of interest to rubber-power enthusiasts. Also lists plans. \$2.00.

Golden Age Reproductions, c/o Jim Fiorello, P. O. Box 1685, Andover, Massachusetts 01810 specializes in reprinted plans from magazines and kits of the 1930s. Also has several quality kits for 20 to 25 inch span. Catalog - \$2.00.

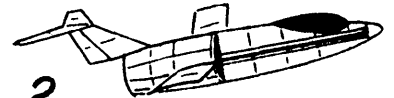
Aero Dyne R/N Models, 15421 Red Hill Avenue, Suite A, Tustin, California 92680 has a 12-page catalog of simple to advanced rubber-powered kits, plans, supplies and tools. Their new Island Flyer, designed by Clive Wiener, is a fine model for newcomers. Catalog - \$2.00.

ALTERNATIVE 1

(USING A STICK FOR A JIG BODY)

LOADING JIG FOR WOUND MOTORSNOT TO SCALE

The way to have the advantages of external winding (as with a stick model) for your fuselage model.

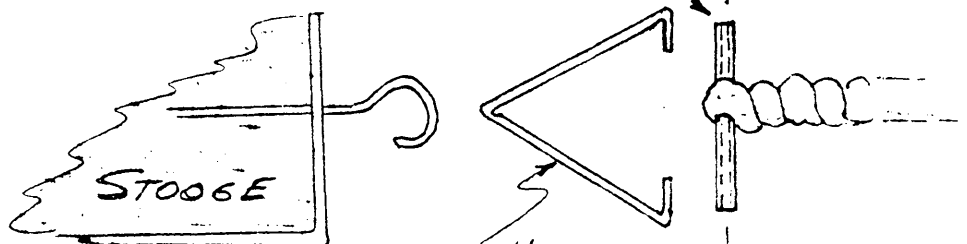
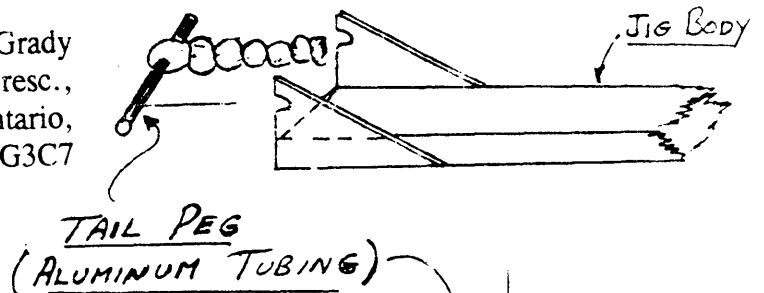
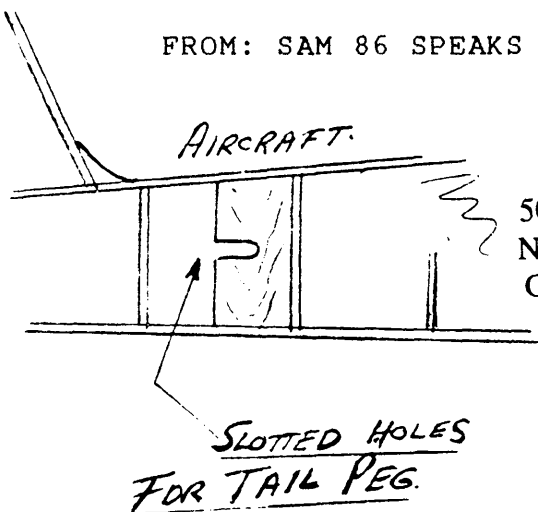
ALTERNATIVE 2

(USES THE ACTUAL TAIL PEG OF THE AIRCRAFT)

FROM: SAM 86 SPEAKS

Editor

Dan O'Grady
50 Largo Cresc.,
Nepean, Ontario,
Canada K2G3C7



Roy Bourke
MARKHAM INDOOR GROUP

(TO ADAPT TAIL PEG TO TORQUE METER/STOGE)

THE F1D CHALLENGE

Lt. Col. Bob Randolph

Partial Motor Test Flights

I have to credit the former World Champ and microfilm supplier Erv Rodemsky for getting me interested in partial motor testing in about 1983. I use this technique extensively and make very few non-official full motor flights. This saves time, rubber, and models. In my opinion, it is the "Royal Road" to successful FAI and other indoor model flying. I also use it when I fly Cabin and Mini-stick very successfully.

The basic concept is quite simple. For example, a quarter-sized test motor requires a test stick that is exactly three-fourths of the distance between hooks and that is weighted to exactly three times the lubed weight of the quarter motor. Since only one-fourth of the full motor turns can be put in, the model should climb to one-fourth of the full motor altitude and one-fourth of the full flight time.

The good news is that four times as many test flights can be made. The bad news is that any errors you induce through inaccurate procedure or faulty estimation of altitude will be compounded.

Make a 1/4 motor test stick that is 3/4ths of the distance between the hooks of your model. I suggest you also make a balance with moment arms in a 3 to 1 ratio to be able to quickly add the right amount of clay to the 1/4 test stick to match each 1/4 motor you fly. Incidentally use lubed test motors for the balance and always center the clay on the mid point of the test stick and mold it evenly around. Failure to do this will affect the model balance or worse, crush your motor stick.

We are trying to determine the optimum motor that will result in the most time for the existing temperature and conditions. After you find the optimum motor, back off turns and launch torque, you can expect that a full motor of 4 times the length and weight will fly close to 4 times the altitude and duration achieved. Since Cat 1 & II require ceiling scrubbing and beam tapping for competitive flight times, I will cover my modified test stick procedures in a future article.

The following is how I flight test a new ship. I make up 8-10 1/4 test motors (use one o-ring) close to the best guess as to the right length and thickness. Lets say this is 4" loop of .070 Tan. I would also make a 4" .068" and .072" plus a 3.5" and 4.5" of these same thicknesses. Balance the test stick for the motor to be used and put in 100 turns. Adjust wing incidence under this cruise power. Adjust circle size if required and check on the ships cruise attitude. If not enough nose up, adjust more negative incidence in the stab. This will mean readjusting wing incidence. You are looking for a floating cruise where the nose stays up to load the prop and reduce its RPM. Too much will produce a mush requiring more cruise power.

Peak 1/4 motor flying time will require a fully broken in motor but I must admit I break in these little motors by my flight tests. You do not want to out climb the site so start out with all the turns it will take

but back off so that the launch torque is 25 units. If this is still too much power, use your steering pole to prevent out climbing your site. Better to only climb 1/2 way up and then keep increasing launch torque slowly. You can't really tell if the motor is the right size until you reach full height. Upon landing, the turns remaining will indicate if you have too much or too little power. A non-VP prop should have about 1/3 row of knots left. A good VP prop will have very few turns left. For either type of prop. going deadstick before reaching the floor means the motor is too powerful. Whether to correct this by reducing the thickness or by increasing the loop length depends on the flight time you achieved.

Keep in mind that we are seeking flight repeatability, so you must be precise in your winding and test stick technique. I like to use several motors of the same size as they can rest and recover more fully between flights. The three most important factors for FAI flying are practice, practice, and practice.

The next article will probably cover VP prop adjustment and my low ceiling technique.

William E. Gough Jr.

Died April 7 at his home in Gurnee Illinois, at the age of 75. He built his first model at age 8 with thin boxwood. Bill was well known in the Chicago area for the many flying demonstrations he put on for Boy Scouts, schools, and libraries. He worked for Comet, Monogram and Playskool before retiring in 1978. In 1988 he was elected to the AMA Hall of Fame. Our sympathies are extended to his daughters, grandchildren and great-grandchildren.

NEW RETRIEVAL TOOL

From: F.M.

L. Kruse and Ben Strauss

Larry Kruse reported the following in his F/F Sport column in the March 1993 Flying Models. You do subscribe to Flying Models don't you? Ben connects two helium filled balloons with about ten feet of fuzzy yarn and attaches the line to the mid point of the yarn. The "V" shape and the fuzzy texture can be used to lift and gently pull on the model. Larry said Ben was able to recover one of his models that had resisted all efforts with the usual single balloon on one line. Oh yes, a subscription is \$23.00/yr or \$43.00/2yr USA. Send order to:

Circulation Manager
FLYING MODELS
P O Box 700
Newton NJ 07860-0700

The "I know, I know" department.
USIC/NATS mini-stick results are missing. This will be late getting to you as this final piece is being glued in place late evening of 7-12-93. Still needs printing (7 days), made ready to mail (2 days), and will spend 4 days to 3 weeks in the mail. Hope you enjoy it.