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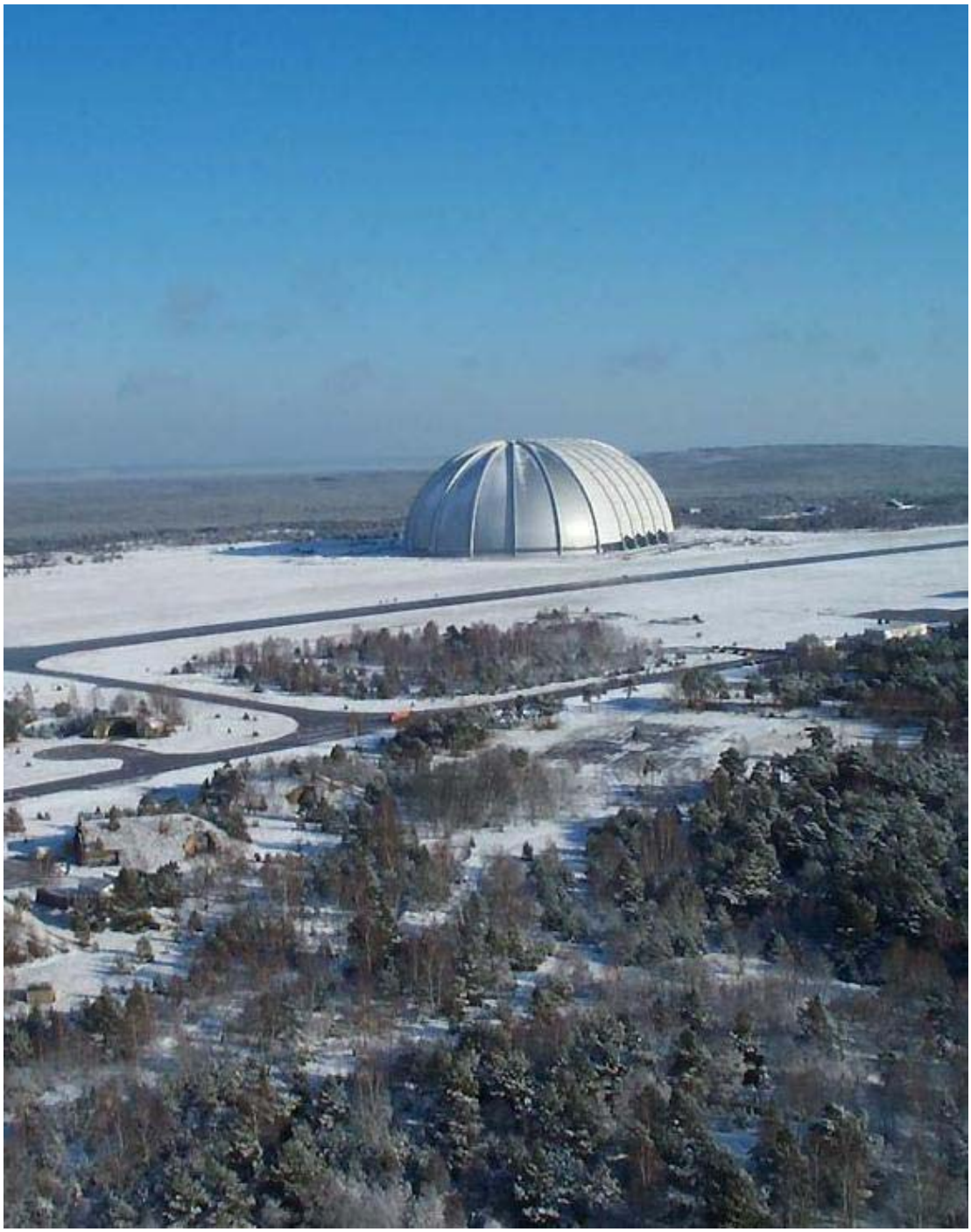

CargoLifter in Winter, Brand, Germany

From The Editor's Desk

Well, the holidays are over for another year, and we would like to thank all of you for your snail cards and e-mail good wishes this holiday season. Many of you used it as a welcome break from building and flying, a time to kick back and enjoy.

My own holidays were hectic, with inlaws and others filling our house down here on the outskirts of New Orleans. Santa brought a new DVD player, and we watched Harry Potter, Lord of the Rings, and of course Bond, James Bond.

The New Year brings many changes and new ideas, and INAV is changing with it, for the better, we hope. Guerilla (or gorilla) flying is introduced this issue with The Scofflaw by Dave Gee, a quick and easy rubber model for flying in church meeting rooms, train stations, movie theaters, and such. Also indoor electric is given a boost by the second annual Uni-Dome Indoor Event at the University of Northern Iowa at Cedar Falls. Contest details follow later in this issue. Both of these areas are sure to be hot items in the coming year, and we welcome your comments.

We made up a belated photo page from the CargoLifter photos of September 14-15, 2002, sent by Mikita Kaplan of Brno, Czech Republic. (I also now own one of those cool, black team shirts). His daughter Gabriela, or Gabi, is also coming up fast in the indoor world. Stay tuned.

Fly safely and have fun. - Carl Bakay

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Send all dues to
Adult subscriptions available online at www.IndoorDuration.com/INAV
Tim Goldstein (INAV subscription editor)
13096 W. Cross Dr.
Littleton, CO 80127 Tim@indoorduration.com

Carl Bakay (editor)
1621 Lake Salvador Dr.
Harvey, LA 70058-5151 carl@sd-la.com

Contributing Editors: Steve Gardner, U.S.A., Nick Aikman, U.K. Cover photo by Nick Aikman

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Sample ad copy should be sent to Tim Goldstein at the above address for publishing details.

From the publishers desk

First off I need to apologize to everybody for this issue of INAV coming out so late. It should have mailed in early January and it is totally my fault that it's fallen behind. The rest of the INAV staff did everything on time and it was me who dropped the ball. The current poor economic times hit me in December when I was told that the company I have been working at will be closing. All employees had to take a pay cut effective of the first to the year. So unfortunately the spare time that I normally devote to INAV quickly became reallocated.

With these changes in my life in mind, INAV need your help. We need to find someone with very strong skills in Microsoft Word that would be interested in helping to produce INAV. The specific help we need is laying out each issue in its final form. The primary requirements are a current version of Microsoft Word, Internet access with the ability to send and receive 4 or 5 MB files, and the time and desire to help INAV. Anyone that is interested should contact me at Tim@IndoorDuration.com or call me at 303-933-9147.

On another front, it has been pointed out to us that we forgot to thank all the contributors to the Jr World Championship team. Sorry for this oversight. The generous support of the indoor community gave the Jr team the needed funds to make the trip. Vern Hacker also deserves to be recognized. He took the initiative to get this started and was the spark plug behind the collection effort. It would not have happened without him.

Tim

We Forgot! The neat balsa density chart in Issue 109 was taken from NFFS "Digest", with the permission of Editor Walt Rozelle. Sorry Walt, and thanks.

UPCOMING CONTESTS FOR 2003

CANADA – ONTARIO - LONDON

Jan2 –Mar 31 2003 HANGAR RAT POSTAL CONTEST Open to ALL indoor flyers, world wide. Classes, same as 2002. (Note change to class "A" rubber selection Both classes must be built to the plan. No alterations!
Class A, change to rubber choice -- May use from 70 thou. to 125 thou.
Class B, No scraping of plastic blades! Must be STOCK. Motor to be 1/8" x 36" max. length.
Entry form available from CD Art Lane at artlane@juno.com, Day Phone : (519) 685-7002 Address : 9-617 Wharncliffe Rd., S., London, Ontario, Canada N6J 2N7

GEORGIA – ATLANTA

TTOMA Indoor Meet – The Thermal Thumbers of Metro Atlanta will be hosting a few more Indoor contests this spring. Check www.thermalthumbers.com for details.

IDAHO – MOSCOW

July 26 – 29 Kibbie Dome Indoor. A 4-day contest with the Wally Miller EZB contest (1.2 gm) flown in the middle of the main event. All AMA and FAI events flown. This is a world class 145' ceiling site. Normally an FAC contest is held at the same time. CD Andy Tagliafico at 503-452-0546

ILLINOIS – CHAMPAIGN

Feb 22,23 Indoor Contest sponsored by the Chicago Aeronuts. To be flown at the University of Illinois Armory, 505 E. Amory, Champaign, IL 61820, a great Cat III site. Entry fee is $20 if done by mail by Feb 12, $30 on site, $1 for Jr and Sr. Fee covers unlimited events. The schedule is:
Sat: 8am-11am HL glider and std. & unlimited cat glider. 11am-8pm A6, FAC NoCal, Science Olympiad, PP, LPP, Bostonian, ministick. 10-11am Bostonian judging. 1:30pm Delta Dart mass launch. 2:30pm double Whammy mass launch.
Sun: 8am-4:30pm intermediate stick, F1d, Cabin ROG, EZB, Helicopter, ROG Stick, F1L.
If you'd like an entry form mailed to you please contact Bob Warmann by mail at 245 N. Oaklawn Ave., Elmhurst, IL, 60126, or Geoff Bower by email at gbower@uiuc.edu

INDIANA – WEST BADEN

Aug 15-17 Indoor Time Trials for Cat III. Fly in this beautiful 97' atrium. See INAV #108 for a history and photos of the resort. More specific details in next issue. Contact: Walt van Gorder, 5669 Victory View Ln, Cincinnati, OH 45233. (513) 922-3351.

IOWA - CEDAR FALLS

March 1-2 UniDome Indoor Rally R/C Contest and Indoor FF
FF Events: #212 HL Glider, #215 Bostonian 7gm., #219 Unlimited Class Catapult Glider, #221 Electric Duration, #505 Peanut Scale, FAC No-Cal Scale, AMA Delta Dart- Jr. and Open classes.
R/C Events: #627 Indoor Electric R/C Duration, Indoor Electric Sport Scale. Contact Mike Gretz at Sig Mfg. for event details. E-mail `mikeg@sigmfg.com`.
Fly hours will be from 6pm to 11pm on Saturday the 1st and from 7am to 4pm on Sunday.
Contact Name : Bob Nelson, 433 Ardmore, Waterloo IA 50701. E-mail : bobsrc@forbin.net
Day Phone : 319-277-0211 Night Phone : 319-233-4771

MASSACHUSETTS – CAMBRIDGE

Evening Indoor at MIT –Flying from 7 pm to 9 pm at MIT's Dupont Gym, the corner of Vassar and Massachusetts Ave. in Cambridge, Mass. Call Ray Harlan at 508-358-4013. Feb 1, May 3.

NEW JERSEY – LAKEHURST

Indoor Flying at Lakehurst – The East Coast Indoor Modelers (ECIM) have the use of Hangar #1 every week from sunup to sundown. The hangar is 800 ft. long by 250 ft., and 180 ft. high. To join, contact Rob Romash at 856-985-6849. E-mail cgrain1@yahoo.com . Dues are $15 a year with a current AMA card.

TENNESSEE – JOHNSON CITY

May 30 – June 3 AMA/NFFS Indoor Nationals, Johnson City, TN. Flying is in the MiniDome fieldhouse of East Tennessee State University. Event schedule in this issue. CD Abram Van Dover is looking for assistant CD's to help out. Write or call him: 112 Tillerson Dr., Newport News, VA 23602, (804) 877-2830.

EXPERIMENTAL STUDIES OF LIFT & DRAG AT VERY LOW AIRSPEED

Vern Neff -- vdneff@aol.com
John Wereb

INTRODUCTION

In a previous article (INAV #106) one of us (V. Neff) speculated about the factors producing lift and drag at very low Reynolds numbers (Re) where little is currently understood about the effects of airflow. As anticipated this article produced some interesting comments from readers and also some controversy.

In order to sort out what is really important at Re < 5000 we have undertaken some experiments with an EZB type wing. The guiding factor in this effort has been simplicity. The experiments are based on a wing moving through air rather than air passing over a static wing. That is, they do not involve the wind tunnel. There are two major reasons for this approach. First of all we point out the well-known fact that the production of a uniform airflow at very low speed is difficult indeed and would require elaborate equipment beyond our means. The second reason is more fundamental and requires some explanation. Engineers use the wind tunnel because it produces (in principle) a uniform flow. This is required in order to simplify the hydrodynamics and to apply the concept of the ideal fluid and the Bernoulli principle. Our interest is more practical and immediate. We propose to measure lift and drag under real indoor flight conditions in order to discover any deviations from ideal fluid behavior. The ideal conditions begin to deteriorate when we get below the so-called critical Reynolds number. In terms of standard aerodynamic theory the critical Re defines a region below which the boundary layer for laminar flow separates completely from the surface of the wing. The importance of the critical Re for model airplanes was emphasized initially by F.W. Schmitz (1). Without going into detail we point out that, at Re < 5000, any airfoil is operating below the critical Re.

The basic procedure we propose involves a wing mounted on a lift (or drag) balance attached to an arm that rotates uniformly at low speed. Under these conditions, in addition to lift and drag, a third centrifugal force acts on the wing. Fortunately the centrifugal acceleration is orthogonal to both lift and drag and does not effect the measurements as long as the wing is in the horizontal plane of rotation.

We plan to do a series of articles on the results of our experiments. For one thing we already have too much information for one issue of INAV. Furthermore the experiments are open ended. We have already done lift and drag measurements on a flat wing. This will probably be followed by measurements on wings of various camber. In addition we can mount a complete model on the existing apparatus. This really opens Pandora's box and we will probably stop when we get tired or, more to the point, when you get tired of hearing from us. In this issue we propose to describe only the apparatus and procedure. Please do not hesitate to contact us concerning questions or objections.

THE ROTATING PLATFORM

In these experiments the wing is mounted on an eight foot rotating shaft. This is shown schematically in Fig (1). Rotating the wing through air presents the problem of a spanwise velocity gradient across the surface. For an 18" wing, the ratio of linear velocities at the outer and inner portions of the wing is 1.04. That is, the outer wing tip travels 4% faster than the inner tip. In terms of lift, this discrepancy can be accounted for by slightly offsetting the wing from center span. In any event we find that the velocity gradient is not experimentally significant as far the lift and drag measurements are concerned. The experimental apparatus does not allow for the measurement of the center of pressure or for wing pitching moments.

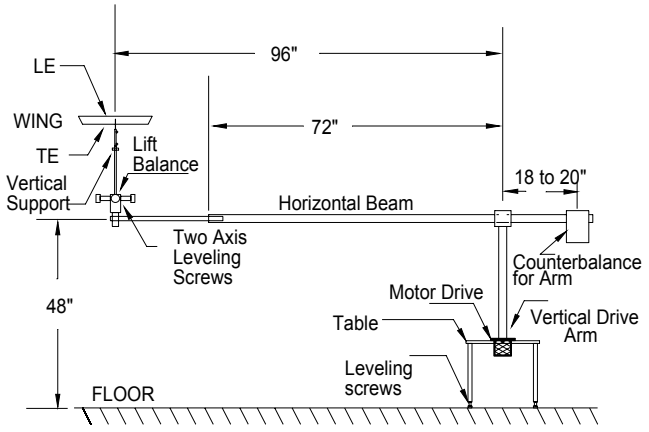


Figure 1 --- Wing Drive Assembly

The central feature of the rotating platform is the heavy-duty precision turntable assembly originally designed for use in a satellite dish positioning device. It is illustrated through a photo rather than a diagram and is shown in Photo # (1).

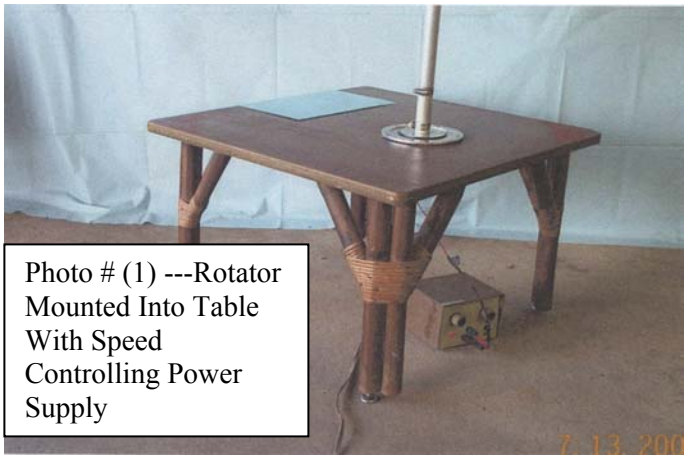


Photo # (1) ---Rotator Mounted Into Table With Speed Controlling Power Supply

The turntable was mounted on a flat platform with legs which are fitted with leveling screws. A 1" diameter aluminum tube 4' in length was rigidly attached to the turntable to serve as the vertical shaft. The horizontal arm also was a 1" diameter aluminum tube into which a ¾ " tube could be fitted at the end in order to adjust the shaft length. This is illustrated in Photo # 2.

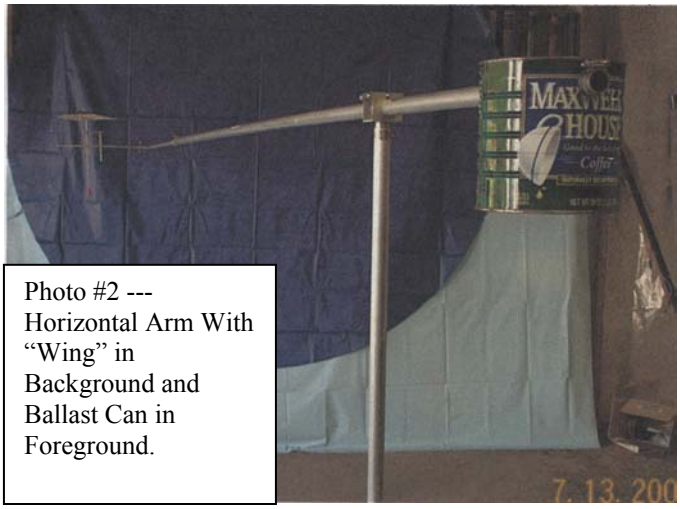


Photo #2 --- Horizontal Arm With "Wing" in Background and Ballast Can in Foreground.

The horizontal arm was mounted with a 2' overhang as shown in the Photo #2 At this end the shaft was equipped with a bucket into which gravel counterweights could be added in order to balance the horizontal arm. The working end of the horizontal shaft was designed to accept either the lift or the drag balance. This receptor is fitted with screws that allow for leveling in both the vertical and the horizontal plane as shown in Photo #3.

The rotator is powered by a 12 volt dc motor with a maximum speed of about 6 rpm. Motor speed can be accurately controlled with a variable voltage dc power supply. We use an ancient Heathkit supply. For the eight foot shaft the maximum rotational velocity gives a maximum linear velocity of 5 ft./s. This is the upper limit of attainable airspeed for the apparatus as described.

THE LIFT BALANCE

Both lift and drag are measured by employing the null principle to balance turning moments or torques. A schematic diagram of the lift balance is shown in Fig. (2).

We call the device a parallel pendulum (PP). The two parallel arms swing about a ¼" diameter solid aluminum rod which fits into the adjustable receptor at the end of the rotating arm. The arms are ¼" rectangular aluminum tubing 52 cm in length. They were drilled and fitted with 1/16" ID brass bearings located at the center. The bearings rotate on 1/16" OD steel shafts fitted into the aluminum rod. The two arms are

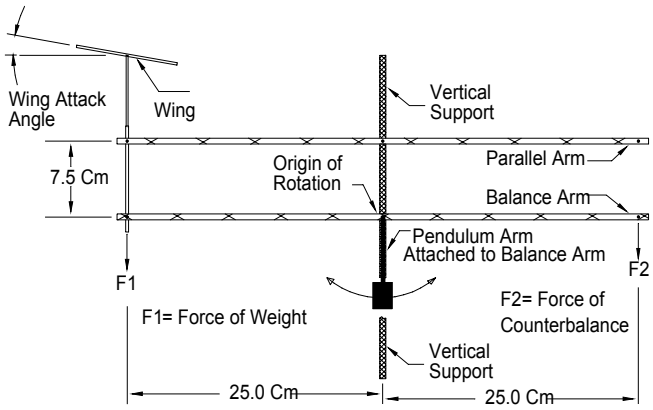


Figure 2 --- Lift Balance Details

separated by a length of 7.5 cm.

The wing mounting arm is located 25.0 cm from the left of center. It consists of 9.0 cm rectangular aluminum into which we attached with epoxy 1/16 " ID aluminum tube which serves to receive the wing mounting wire. All bearings were 1/16 " ID polished brass rotating on 1/16" OD steel shafts. The wing is mounted by attaching (with epoxy) a stiff 1/16" diameter wire to the under surface at the center of the chord. Slightly crimping the wire allows one to force it into the mounting tube with a tight fit. The wire is flexible enough so that it can be bent to any desired angle of attack, but stiff enough to hold this position during a measurement.

Photo #3--- Vertical and Horizontal Adjustment on End of Horizontal Arm.

A 1/16" OD brass pendulum arm is rigidly attached to the lower parallel arm. It serves two fundamental purposes. First of all it serves as a marker for the null measurement. That is, the measurement is made when

at a certain flight speed, the arm is exactly vertical (i.e. parallel to the direction of the gravitational field). This position is determined visually be simply observing the position of the arm as we gradually increase flight speed (remember that flight speeds are very small). Although this method seems absolutely archaic; it actually works quite well and leads to reasonable reproducibility of the

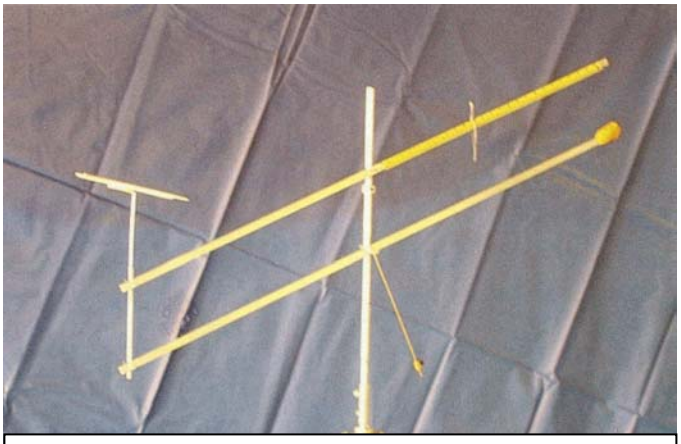


Photo 4 --- Lift Balance in Off-null Position

Photo 5 --- Lift Balance in Null Position

measurements. What this method of measurement lacks in sophistication, it definitely gains in simplicity. The second function of the pendulum arm is to act as a counter weight and to allow for adjustment of the sensitivity of the measurement. The sensitivity varies with the angle of attack. The arm is equipped with a movable cylindrical brass weight that can, if necessary, be adjusted at different angles of attack.

Because the equipment described in the preceding presents a certain relatively small (compared to the wing) cross sectional surface area, it can affect the lift when moving at some given speed. For this reason we have designed the apparatus keeping in mind the idea of compensation. For example, the parallel arms left of center would contribute lift if the rotation is counterclockwise. On the other hand the arm would contribute negative lift in the region to the right of center. This is the main reason why we have chosen both arms to be the same length. This effect will vanish when we are at the null position and that is one of the major advantages of the null measurement. It could, however, cause problems when we are off-null which would lead to an unequal sway in the pendulum. The balance condition
for the torques and forces is indicated on the diagram.

Photos #4 and #5 show the lift balance in the off-null and null position respectively. They illustrate clearly the simplicity of the visual method of null detection.

The actual procedures for the lift measurements are as follows: We first mount the lift balance (including the wing) on a stand for the purpose of standardizing the measurement. The gross weight of the wing is then balanced by adding clay to the lower arm at F2 and a nominal weight, e.g.—1.0 gram, to the upper arm at F2,

(refer to Figure 2). When we achieve perfect balance we transfer the apparatus to the rotating platform. Here we first adjust for the proper angle of attack and then for proper horizontal and vertical alignment. We then remove the 1.00 gram weight and the wing drops to a lower position determined by the mass of the pendulum arm and its counter weight. We then gradually increase rotational speed until the wing rises to the null position. At this speed there is l.00 g of lift operating on the wing. The flight speed in ft./s is recorded at this speed. We then attach a nominal weight, such as 0.100 gram to the right side of the upper parallel arm. Again the flight speed is increased to the null point. At this speed there is now 0.900 g of lift on the wing. This procedure is repeated in increments of typically 0.100 or 0.200gram up to 0.900 gram at which weight there is 0.100 gram of lift on the wing. The wing speed is recorded for each weight. We thus obtain data for lift vs. speed at a given angle of attack. We repeat this series of measurements for the wing set a different angle of attack. This procedure is very useful because we obtain data for lift vs. flight speed at a given angle of attack as well as lift vs. angle of attack at a given flight speed.

THE DRAG BALANCE

In principle the drag balance is essentially a lift balance rotated by 90 degrees. In practice there are important additional considerations about drag measurements. First of all, at relatively low angles of attack, the drag coefficient is only a small fraction of the lift coefficient so we need very good sensitivity to measure it. The problem of compensation, discussed above, also becomes more acute. The reason for this is that the various instrument components contributing to drag are blunt (non-streamlined) objects that produce very large drag effects. In addition the drag torque must balance the gravitational torque. In this case the corresponding forces are at right angles rather than in opposition as in the case of lift.

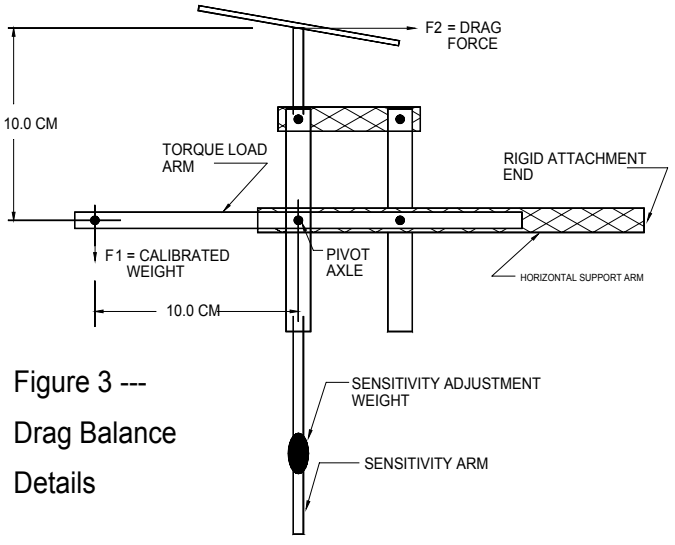


Figure 3 --- Drag Balance Details

A schematic diagram of the drag balance is shown in Fig. (3).

The mounting rod is in the horizontal position. The parallel rotating arms are vertical with respect to the gravitational field. A torque load arm is rigidly attached at its center to the forward (left) parallel arm. A 1/16" hole is drilled in this arm at The position of F1 10.0 cm from the center. The purpose of this hole is to accept wire weights of different magnitude. The pendulum is mounted rigidly to the forward parallel arm as shown. Clay was attached to the pendulum arm as the Sensitivity Adjustment Weight. In this case the weight added serves to standardize the balance and also acts as the counterweight. The vertical wing mounting tube is rigidly attached to the horizontal crossbar separating the pendulum arms. The crossbar remains in the horizontal plane of rotation at any angle of the pendulum arms. The wing mounting tube is designed so that the center of the wing is l0.0 cm from the center of rotation. This was done so that the gravitational torque T1, at F1, and the drag torque T2, at F2, both have the same radial length. The relationships are: T1 = 10 X F1 and T2 = 10 X F2. The dimensions of the various parts and bearing surfaces are the same as those used for the lift balance. For drag measurements the pendulum serves the same purpose as the indicator for the null position which is again determined from visual observation.

The procedures for the drag measurements are as follows: The horizontal support arm is first mounted vertically in a rigid stand. Clay is added to the pendulum arm in order to balance the mass of the wing and its support structure. When the wing is balanced the mechanism is transferred to the end of the horizontal arm such that the support rod is mounted horizontally, not vertically. The balance is then adjusted for horizontal and vertical alignment and the angle of attack is set as described previously for the wing balance. The balance is at null with no extra added weight so, in this trial, we add a small weight , such as 0.100 gram to the hole in the left arm at the position of F1. The wing moves down to a position determined by the torque of the pendulum. Airspeed is gradually increased up to the null position. At this speed the wing is experiencing 0.100 gram of drag. In the case of drag we incrementally increase the weight on the left side of the fulcrum whereas in the lift measurements we incrementally increase weight on the right side. Again we make a series of measurements of drag vs. flight speed at a given angle of attack. We then change the angle of attack and repeat the procedure. Photos #6 and

#7 show the actual drag balance in the off-null and the null positions.

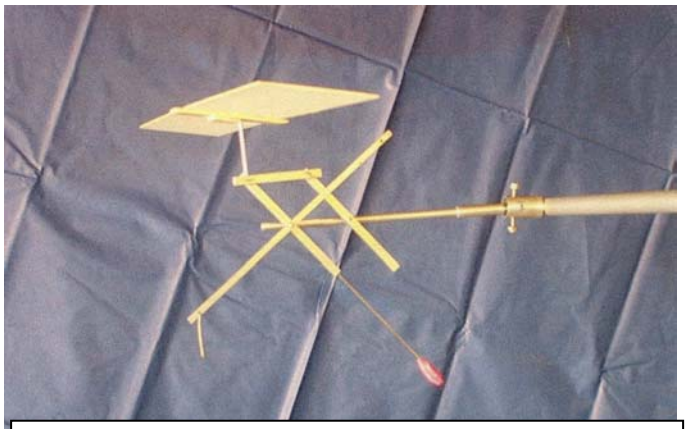


Photo 6 --- Drag Balance in Off-null Position

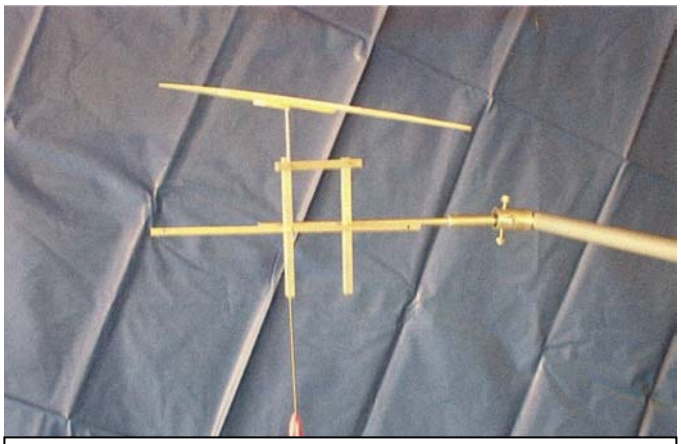


Photo 7 --- Drag Balance in null Position

4. EXPERIMENTAL ACCURACY

Data were obtained for a flat wing with a span of 18" and a chord of 3". The wing has the dimensions of an EZB but not the weight. It was constructed from a flat sheet of 1/20" balsa sanded smooth with #600 emery paper. This gives a stable structure with which we can work without worrying about the flimsiness of a real indoor wing. The actual wing mass is irrelevant because it is balanced out by our null procedure. We made a series of 5 measurements of flight speed required to obtain 1.00 gram of lift for the flat wing set at an angle of attack of 10 degrees. The data are presented in the following along with the relative standard deviation from the mean.

LIFT --- Grams	Flight Speed --- feet/ sec
1.00	2.494
1.00	2.531
1.00	2.539
1.00	2.543
1.00	2.528
Relative Standard Deviation = 0.686 %	

In a following issue of INAV we will submit the results of measurements on the flat wing. They are both interesting and, in some respects, quite surprising. As a teaser we add that they do not support the Newtonian equations for lift and drag at large angles of attack. They also do not support what we would anticipate from standard aerodynamic theory at higher Reynolds numbers. Please stay tuned!

REFERENCE

(1). Schmitz, F. W., Aerodynamic des Flugmodells, l942, Carl O. Lange Verlag.

MAKING ROUND PROPELLER SPARS.

Nick Aikman

The usual way of making round, tapered spars is to twirl the wood between a folded piece of wet and dry paper. Whenever I tried this method, my results appeared to have been chewed by small rodents. The method I now use is hardly rocket science and others have probably discovered it as well. However, it does produce infinitely better results and with the current UK vogue for splitting the prop ribs and gluing them on either side of the main spar instead of on top, I offer this method of spar production for your scrutiny.

First, make 2 large sanding blocks 28.0 cms by 11.5 cms. These blocks MUST be perfectly flat – mine are from ½" MDF. Take 2 sheets of wet and dry paper, 1 of 320 grade and 1 of 400. Cut these sheets in half lengthways and then 'Spraymount' them to the 4 faces of the blocks, giving 2 blocks with a different grade on each face.

Cut a series of oversized, tapered spars, ½" longer than the finished length will be. For my last batch of F1D props, I used straight, even grained, 4.25 lb, A grain sheet. These blanks should be square in cross section and approximately 0.110" wide at the big end, 0.080" at the other. Draw a line across the big end of each spar to show its orientation when finished. In the top drawing, the spars are drawn overlarge in relation to the blocks for clarity.

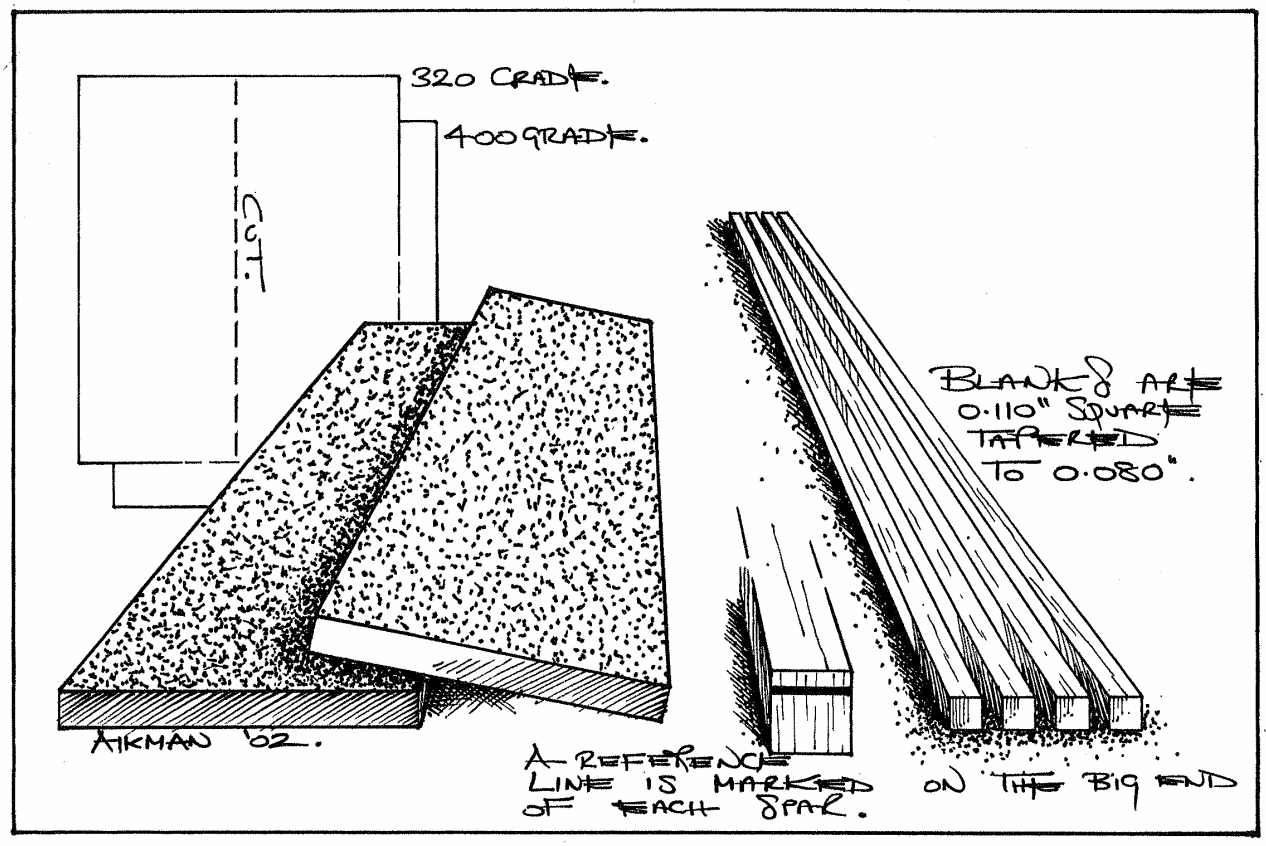
Now to make some balsa dust. Take a block and place it on your workbench with the 320 grade face upwards facing diagonally away from you. Place one of a matched pair of spars lengthways on the block and put the other block on top with the 320 face downwards. The 320 grade faces are for roughing out work, the 400 faces for fine finishing.

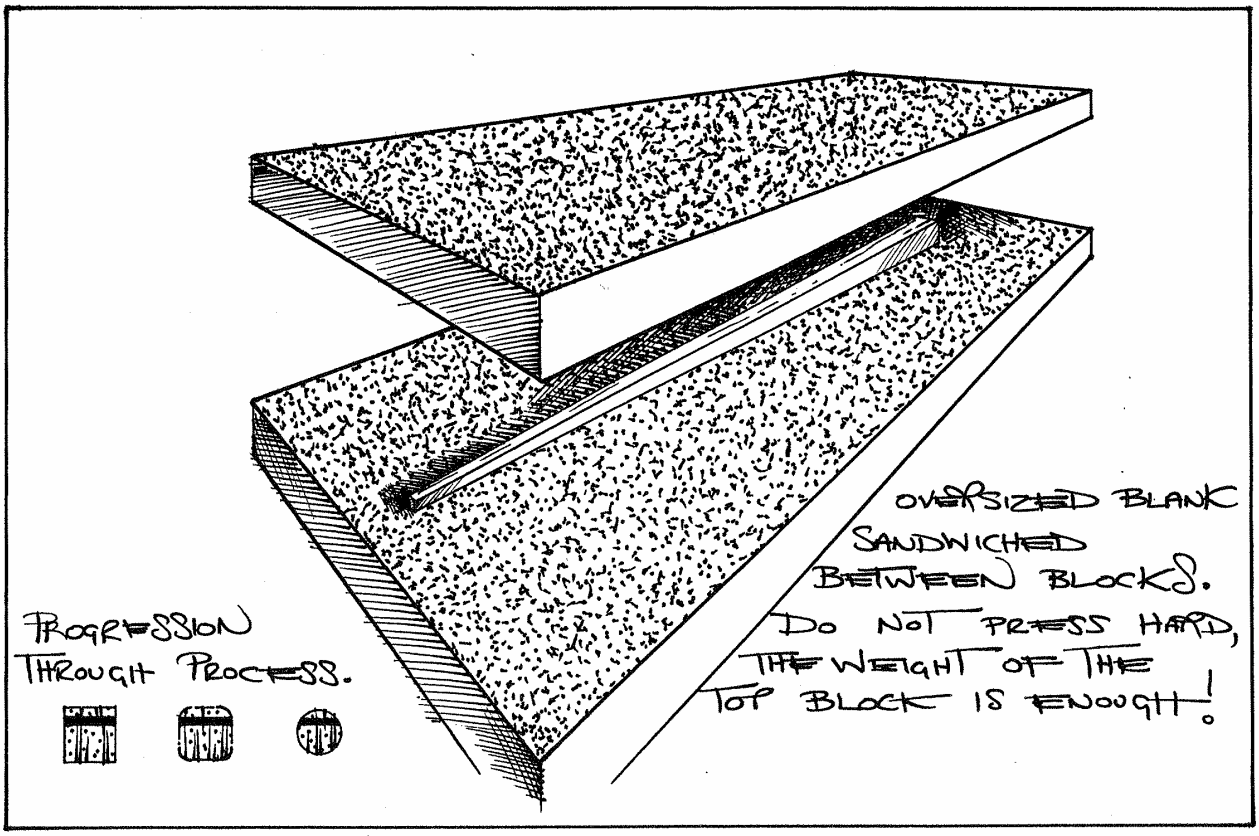
Holding the top block half way down, move it from side to side over the other block – the trapped blank will begin to rotate and a characteristic 'chattering' sound will be produced. It seems to work best with the fat end of the spar away from you. As you continue to move the block from side to side, the edges of the blank will become rounded as material is ground away from the corners. This is not sanding in the normal sense, you do not need to press down hard with the top block. The constant rotation as you move your hand takes away more and more balsa and the motion becomes easier as the blank cross section becomes more circular.

Working to produce a matched pair of spars you need to alternate between the two, comparing weights and diameters as you go. After the roughing out, when the spars become round, you can speed up the process by moving the top block backwards and forwards lengthways, as you continue with the sideways motion. Your arm becomes a machine. The lengthways motion comes from the shoulder joint and the sideways motion from the elbow. Touch and feel are important as you can't see what is happening. By pressing down lightly more on one end of the block, you will take more material away from that end than the other and can change the taper.

The 400 grade faces are used for the final stages as the diameters get smaller. Care is needed at this stage although the process is easier as the top block is gliding over the rotating spar which has in effect become a roller. Balsa is still being removed as you work. Using 2 or 3 full length pieces of boron on each spar (see next INAV) the final spar dimension can be modest – 0.060" dia' down to 0.030". Finished weight for a pair of spars without boron will be around 0.050 gms. Trim the spars to length.

Using this method, I can produce a matched pair of spars in about half an hour. I have also made 35 centimetre prop spars this way tapering from 0.045" dia' down to 0.018". Oval sections can also be made using rectangular blanks, as long as the rectangle is not too extreme.


320 GRADE.
400 GRADE.
CUT.
AIKMAN '02.
BLANKS ARE 0.110" SQUARE TAPERED TO 0.080".
A REFERENCE LINE IS MARKED ON THE BIG END OF EACH SPAR.


OVERSIZED BLANK SANDWICHED BETWEEN BLOCKS.
DO NOT PRESS HARD, THE WEIGHT OF THE TOP BLOCK IS ENOUGH!
PROGRESSION THROUGH PROCESS.

Scale Matters!

By Dave Haught
DHaught042@aol.com

At left: The famed Pistachio that really flew! The prop,made from a water cup at the motel during the Kibbie Dome meet, made the model a success.

Ahh back again I see, well here we go!

Aluminum is the future!?

Last episode I mentioned using paper for landing gears and struts in an attempt to keep things light-especially at the tail. One other trick I stole from someone out there is to replace all the steel music wire on my model where possible with aluminum wire. Aluminum weighs exactly half of steel for the same volume, so the savings is significant. The landing gear on my 36" Turbo Porter is fashioned from 1/16" aluminum welding rod. It is easy to work, sands and cleans up nicely and is more than sufficient for indoor models. I have also acquired a selection of very small gauge aluminum wire of many sizes from craft shops-its used to string beads and such. Hardware stores sell rolls of aluminum wire in larger sizes, and the aluminum welding rod-available by the 36" stick can be bought at most welding shops for less than a dime each -sizes are 1/16", 3/32" and 1/8." This stuff is super for all kinds of applications from spark plug wires to exhaust stacks. I have used an aluminum core slipped into a thin heat shrink tube for curved exhaust stacks-works great! Try it and loose some weight!

Spun Aluminum Too?

While putting the final touches on a Dime Scale Spirit of St. Louis I found myself getting carried away. The model has very little to offer in details after you put on the compass and skylight, so the focus becomes the nose. The first hurdle was the classic turned aluminum cowling. I tried several brilliant schemes but they all seemed too heavy. I searched through the grocery store for the thinnest aluminum foil, then over to the craft store for what they might have, I even bought a few candy bars hoping to rob them of their foil, tasty, but foil is foil, and foil is all too easily snagged and torn when its thin enough to meet our weight requirements.

The only steel wire in the entire model is the prop shaft and the wheel axles. The landing gear is all sheet balsa.

As I was sifting through my covering drawer I found a small piece of 1/4 mill mylar I had left from my old AMA outdoor days. Hmmmm. It was definitely light enough, tough too, but how to put the cool spinny things on it? I tried a pencil eraser stuck in my Dremel-way too fast! Then on my drill press-way to awkward. In desperation I chomped down my corn dog dinner and as I was chewing the thoughts over in my mind I caught myself chewing the corn dog stick too, hmm its round. . . I dug out a small paper hole punch-one that cuts a hole 3/32" dia, punched a few disks out of 600 sandpaper, stuck one to my corn dog stick and simply twisted it between my fingers on top of the mylar.

Excellent, circular scratches! (Isn't amazing what makes our days?) It worked! I discovered it worked best if I taped the mylar down to the bench. Then to attach it to the Spirit. Next hurdle, the mylar was too flimsy, so I glued it to a thin sheet of typing paper to stiffen it up, cut it into neat panels just like on the real ship, added a row of embossed screws on the joint lines and glued the panels to the model-wow it looked great. Next the engine, even though you may need nose weight, that is no excuse for going off your diet! Whilst shopping at the produce section I found that tomatoes and such are often shrink wrapped on foam trays-nothing new? These were black foam! Even though I hate to eat things that are good for me, I bought the tomatoes, gave them to my wife and proceeded to carve the foam into 1/8" square strips, then sand off the corners with an emery board, then run them through a steel nut, like you would a screw. That put a neat set of rings on the cylinder. Then rocker box covers, aluminum

wire pushrods and spark plug wires, exhaust stacks and onto the cowl they went! This hobby is way too cool! Even though my wife did not share my sudden enthusiasm, she did recognize the model, there is still hope!

Too strong you say?

Most of us have hard habits to break. One I see a lot is we over-build our models. Huge gussets, excessive sheeting, and even when we do our best to keep the model as light as possible during the construction and covering phase, we often get in a hurry and stick on a set of plastic wheels that weighs much as the model! I have been rethinking strength a lot lately. When your model only weighs a few grams, you really don't need a flexible shock absorbing landing gear like you may outdoors. The floors in our flying sites are often hard, smooth varnished surfaces, I suspect that before the spring effect of our wire landing gears get to function, the model has already bounced back into the air. For several months I have been eliminating all the wire in the landing gear of my models, just use good balsa wood for the struts and make sure your joints are accurate. Most real aircraft have strong landing gear designs, knee struts, braces, etc. that worked on the real ships. Since we try to duplicate them on our models, why not make them functional? I use a lot of paper and even stiffened thread to simulate back up struts and even bungee cords, which works well with one other item. The anchor point. I used to use an aluminum tube securely glued into the wing or fuselage to plug my landing gear into. Now I use a gusset of light, soft balsa with an undersized hole drilled into it. The landing gear strut is a balsa dowel with a small strip of aluminum wire imbedded into the strut and glued there with CA. It slips snugly into the gusset on the wing or fuselage with a 1/32" gap to allow the wire to bend, flex, or even completely collapse if necessary. I have found this attachment has saved me many a wing and ripped up fuselage with little damage after an impressive crash.

Its 1903 again!

Air minded addicts will no doubt pay some homage to the Wright Brothers this next year, why not do it wright? (Man I love puns!) After seeing the new kit for the Wright Flyer by Dare Design in the magazine ads I had to have one. As I picked through this fine kit I realized I had been here before. Indeed on my shelf of kits I have accumulated over the years, I found not one but three other Wright Flyer kits! Hmmm. What does this mean? Glancing over to my desk my eyes land on my Wright Brother collection, three different sizes of plastic display models from the Hallmark collection-way to valuable to put on the Christmas Tree! And the Monogram plastic model I built in a fit of insanity. None of them will be lifting off into the gym sky, so what to do? BUILD ONE OF THE KITS!? Yikes! I haven't built a kit for . . . So instead what do I do? Take all the neat ideas of all the kits and scratch build a pistachio, a peanut, and a 24" model! Now I know what you are thinking, but its only a boarder line obsession, I can still stop when ever I want to! If you have the Wright bug you may want to join us in this year's celebration. Several clubs around the globe will be holding "Wright Flyer" events, we will have one at the Kibbie Dome in July (shameless plug) for any and all sizes that show up, duration and distance are the categories so far. Besides the new Dare Design kit there are a few Nowlen Aero Peanut kits out there, a great peanut plan in December 1994 Model Builder, and I think the old Easy-Built kit could be made flyable. Now once you get into the race you will soon notice there were three to five different "Flyers." The Kittyhawk first Flyer has no curve in the landing skids-the later versions did. You might check into the rules at your intended contest site to see how they will rule on this. The later Flyers had extended nose and tail moments which make for a smoother easier to trim model.

Flight Logs.

No I am not talking about heavy models. I'm talking about keeping detailed flight records on each model to help in understanding its performance and give you insight into why it does that weird thing when you wind it too far. Most of us start this hobby just for fun. Then it gets to be a challenge as we try to get more duration, more altitude, more rafters, more glory, more minions, more, more, more . . . hmm. Maybe we shouldn't go there. Back to the records. I started seeing the need for records when I flew so many different models in so many different sites. One room had a 22 foot smooth ceiling, the next 28 foot with open girders! Too many winds put my Tiger Moth into danger. As it swooped through the open girders my blood pressure got as high as the model did. I soon learned that two things were essential, a torque meter and a record book. I now know that 1400 turns will give me a good 70 second flight and keep my Moth from suffering rafter rash.

Here as always you can go to extremes. At first I just kept track of winds and times on a 3 x 5 index card. Then I added motor size, length, (ok, motor weight too for you duration guys), how fresh the motor was, duration, flight patterns, and trim adjustments. These will all vary depending on your model and how close you want to keep tabs on it. I have recently begun to chart the time the model levels out under high ceilings and take note of any flight path changes that seem consistent. I have a No-Cal B-25 that has a wonderful climb to 50 feet in 30 seconds,

then it slows suddenly and goes into a cruise mode for 15 seconds, still turning left. Then at 45 seconds it has a slight wobble in the wings, stalls, then makes a 90 degree left turn and flies straight for 5 seconds, another wobble and 90 degree turn and then a final wobble and a tight spin in to the right. Way cool. I don't even want to know why it does this, I like it! Try charting your beasties and you will be able to wow the crowds with just how close you can get the rafters without hitting them as well as use the information to extend your flights, more on this later, meanwhile where is my winder?

Till next time, keep it light! Dave

'DREAM EXTREME'

A 'Droop boom' F1D by Ron Green.

'Dream Extreme' is a direct development from last years' 'Dreamduster', shown in INAV 105.

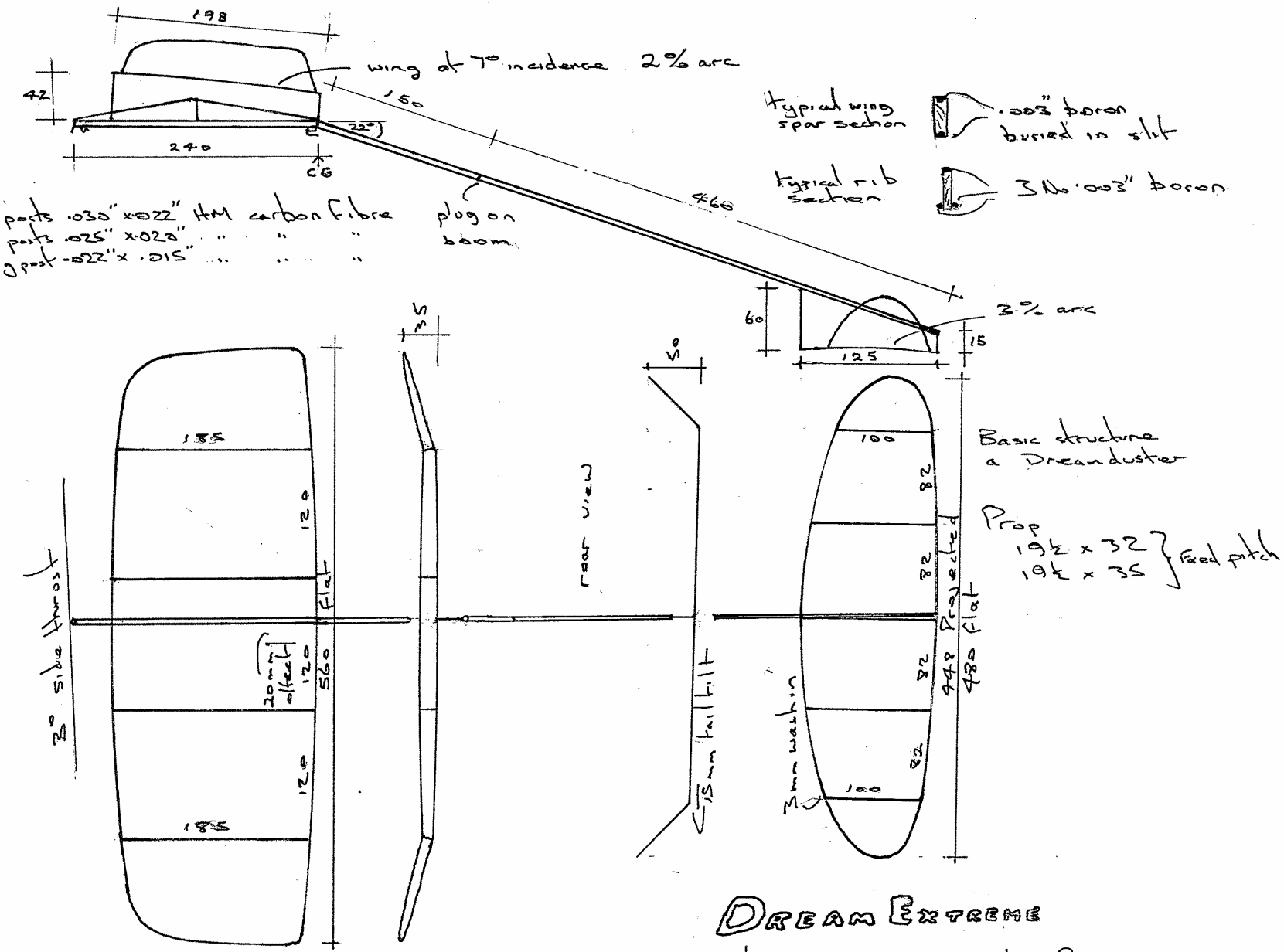
The developmental sequence began with Bernie Hunt's prediction programme suggesting that a 10-inch vertical gap between the wing and tailplane might be an optimal figure. So, with this in mind, 5-inch wing and tail posts were tried. Post drag was kept minimal by the use of high modulus carbon fibre in very small sections. The problem with this was the weight penalty from the carbon. Bernie's input solved this problem by the use of the drooped boom, which had been seen on Dieter Siebenmann's model at the first 'CargoLifter' meeting in 2001. Using a drooped boom is structurally superior and also much lighter due to the reduction in post lengths.

Dieter's theory was also put to the test with the wing incidence set-up. He believes that the prop is more efficient when operating at 90 degrees to the flight path. This was confirmed by tests conducted on Bernie's whirling arm rig. The wing incidence was set at 7 degrees and the model was trimmed to fly with the motor-stick as close to horizontal as possible. An attempt was made to reduce drag from the wing by using thin (0.060" deep at the root) boron/balsa composite spars, also by using a 2 percent airfoil section and by reducing the tip dihedral to 35 mm. This reduction reduces the area of the covering film by a small but significant amount.As with all experimental changes, test flying to assess the layout is paramount and this proved to be difficult at times as the design was changing, sometimes almost daily with new input from Bernie.

Overall, I am convinced that this model has very good potential. It flew an unofficial 37.00 minutes at this year's 'CargoLifter' meeting with less than a fully wound motor. I had a hard time at the World Champs with a hang-up on the catwalk in the first round and then twice having motors blow up just after launch. Lady Luck was not with me!

I shall persevere with these models next year, with minor changes. Hopefully, I can realize the potential that I believe exists.

Good fun isn't it!! -Ron Green.



DREAM EXTREME

designed & drawn by Ron Green
Best time Unofficial 37.03
Cargolifter Germany

Jim Richmond's World Champs winning “SALTY DOG" F1D

This rather simple looking plane with the less than complementary name is the result of the most extensive developmental effort I have made in a long history of model plane design.

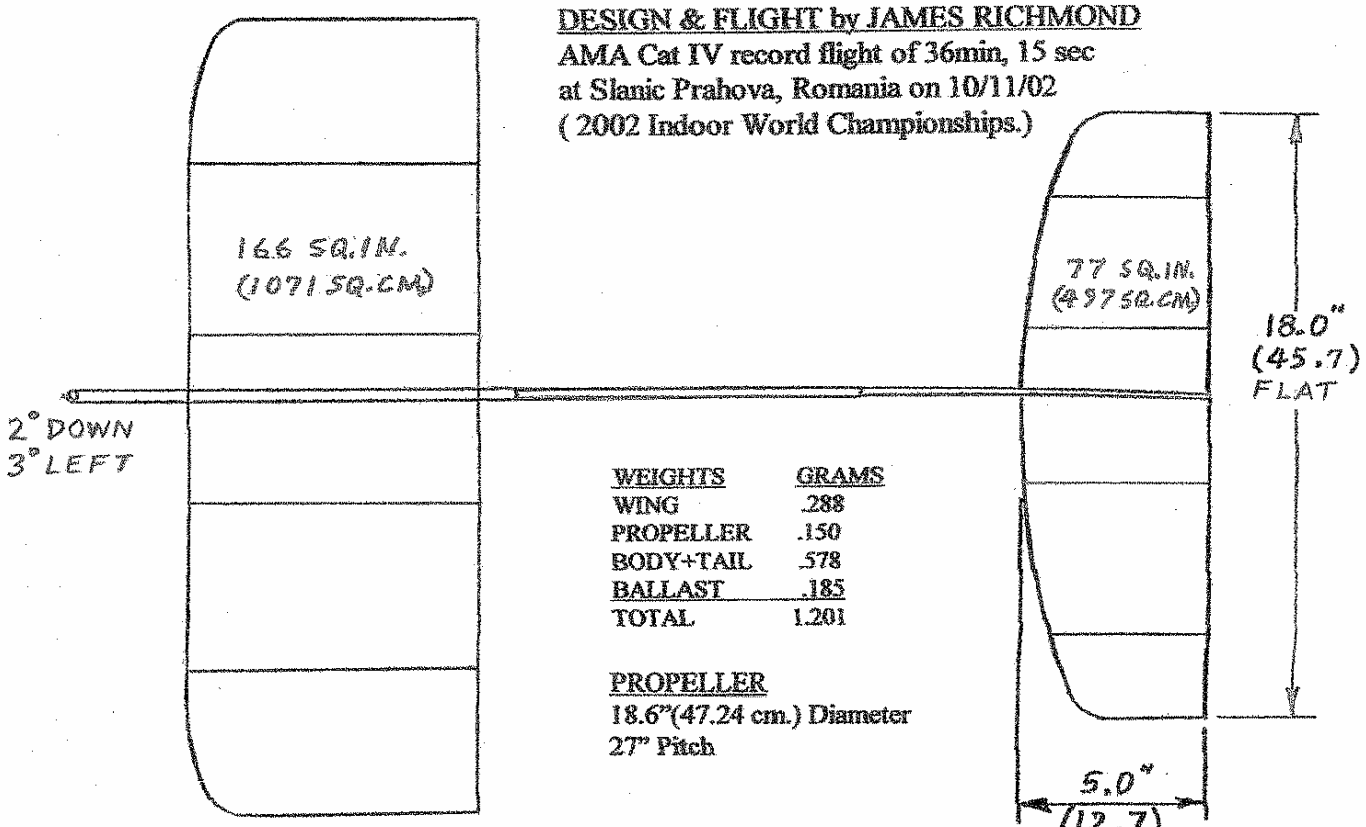
This program was begun after the 2000 world championship with an effort to apply the old F1D technology to these smaller planes. It became apparent right away that the high torque climb-out had to be handled differently- something like the way the Easy B's do itand so the wing bracing was eliminated. The following are the design changes that were made, and the reasons for them:

1. No wing bracing. Permits wing twist for good climbing turn.
2 Boron stiffened wing spar. Needed due to lack of bracing.
3. Stab lowered 1" below boom. Reduces the center of drag and lowers the C. G. to improve the late stage climb-out (less likely to stall during a steep climb).
4. Shortened wing posts from 4" to 3 1/2". Same reason as #3 above.
5.The use of stab tip dihedral (and no rudder) for easier construction, less drag, and less weight.
6. The use of a wire spacer on each end of the motor. They are removable to avoid adding to motor weight and they permit moving the wing away from the prop. They also permit the use of a motor stick long enough to accommodate the wing posts.
7. Stronger wing posts with boron on 3 sides. The twisting wing was found to be tough on prior wing posts (broke 3).
8. Straight instead of angled wing posts. This provides a longer inboard wing and gives more wash-in than wash-out during the wing twist phase for a better climb-out.
9. 75% C.G. instead of 70% for a better cruise.
10. Y2K2 instead of microfilm. Hey, I like this stuff ! It's strong and dimensionally stable and it doesn't die of old age

Now that we have a plane that flies, all we need is a prop/motor combination that works in the Slanic salt mine. Not having had the opportunity to fly a plane of this type in the mine before, we were all scratching our heads trying to figure it out. In my case, I had brought an assortment of 11 props, hoping at least one of them would do the trick. As it turned out, the oldest and least likely one of the bunch gave the best performance.

When I go to a competition, it is my usual practice to take a less desirable plane out of the box first, especially if it needs testing anyway. Then I can develop my "indoor touch" once again without risking the "good stuff". In this case I took out plane #2 which I regarded as the worst in the box (the "dog") and began the series of 1/6 motor test flights. After the last day of testing of several planes, guess what ? The "dog" of the bunch was doing the best time! Not being one to argue with the facts, I made my first few official flights with plane #2 and it made my second longest flight of 35:29. The full motor flights however, were turning up some problems- like power stall and a huge first circle. At this point, the competition was already won, but I switched off to the #5 plane for the remainder of the officials and it behaved perfectly.
O.K., so we tested and adjusted the planes and managed to win the world championship. Now for the rest of the story:
The prop I had selected as being best had been modified from an old F1D 17-1/2" prop made in the 1960's. Props made during this era were very light and delicate and this one was no exception. when I arrived home from Romania, I found I needed a drawing of this prop to go with the drawing of the plane. So when I started measuring it, guess what? One blade was broken in 4 places ! The three inboard ribs were cracked just behind the spar and the outline was broken at the rear spar junction. All were being held in position only by the sturdy green microfilm covering. I knew immediately that this was steering damage and that it must have occurred during my 1 Lt round attempt when the prop caught on the line. So all of my official flights were made using a prop that was broken in 4 places. How about that ?

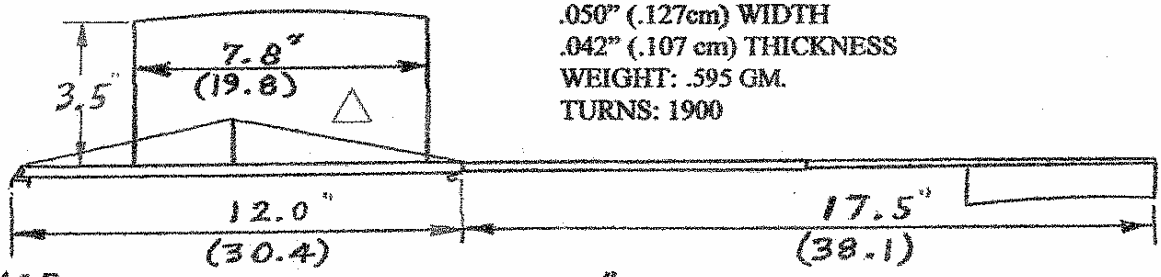
DESIGN & FLIGHT by JAMES RICHMOND
AMA Cat IV record flight of 36min, 15 sec
at Slanic Prahova, Romania on 10/11/02
(2002 Indoor World Championships.)

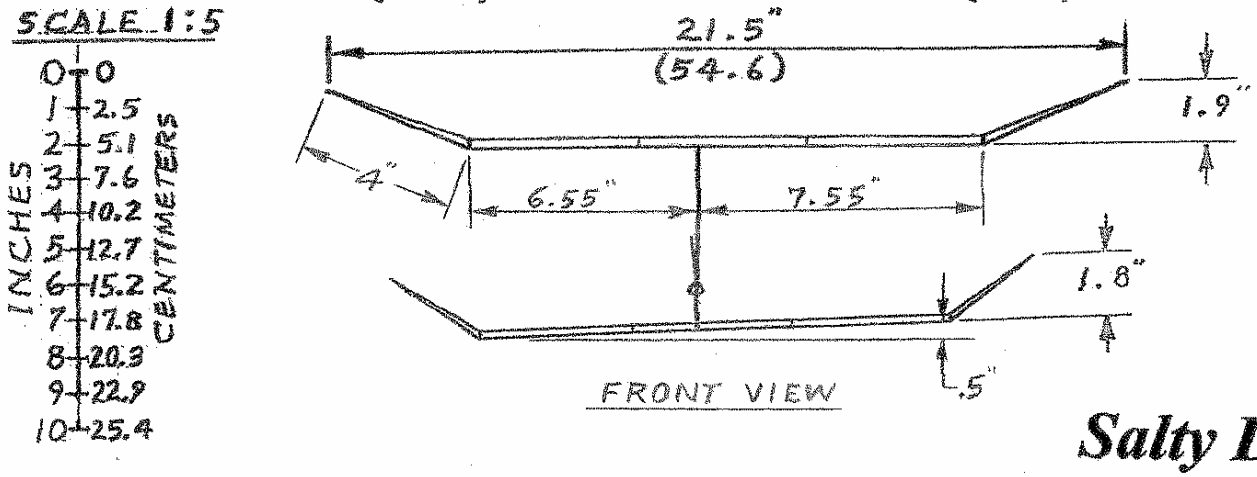


WEIGHTS	GRAMS
WING	.288
PROPELLER	.150
BODY+TAIL	.578
BALLAST	.185
TOTAL	1.201

PROPELLER
18.6"(47.24 cm.) Diameter
27" Pitch

RUBBER MOTOR
9.5" (24.13 cm)
.050" (.127cm) WIDTH
.042" (.107 cm) THICKNESS
WEIGHT: .595 GM.
TURNS: 1900

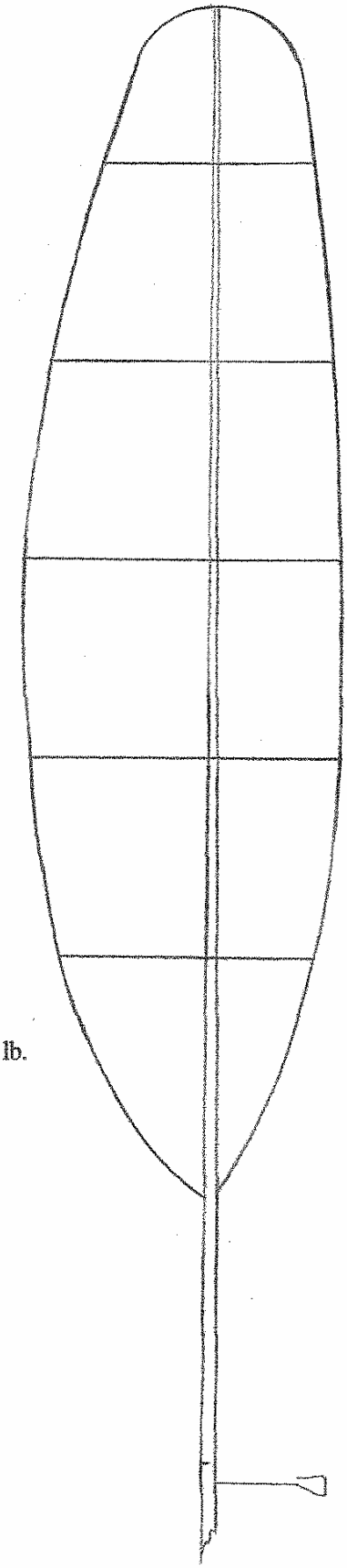




Salty Dog

Materials & Dimensions

Wing	
spars	.035 x .046 - 5 lb.
	.003 boron top & bottom
middle ribs	.030 x .037 - 4.5 lb.
compression ribs	.032 x .040 - 4.5 lb.
tips	.032 x .043 - 6 lb.
tissue tubes (2)	1/16 I.D. x 3/8 long
airfoil	3 % arc
Stabilizer	
spars	.042 x .032 - 5 lb.
ribs	.030 x .040 - 4.6 lb
tissue tubes (2)	.050 I.D. x .300 long
airfoil	2.5 % arc
Motor Stick	
tube	.0135 wall- .250 I.D. x 12"- 3.9 lb.
	(3) .003 boron ; (each side& bottom)
webs	.020- 4.5 lb.
rear hook	.013
bracing post	.045 x .045→.034 x .934- 5.5 lb.
thrust bearing	.012 aluminum
wing posts (2)	.037 x .045 x 3.5"- 5.5 lb.- ends
	fattened to mate with 1/16 I.D.
	wing tubes. .003 boron 3 sides
Extension	.010 wall - .250 O.D. x 9"- 3.9lb.
Tail boom	
tube	.009 wall- .235 O.D.→.100 O.D. x 9"- 3.9 lb.
stab post (front)	.054 x .035 x 1. 200 "- 5.0lb.
stab post (rear)	.054 x .035 x .950"- 5.0lb
Propeller	
spar	.055 x .090→.030 x .030 x 18.6- 4.5 lb.
ribs	.020 x .020- 4.5 lb
outline	.020 x .020- 4.5 lb
shaft	.013 dia.
airfoil	3.5% arc



UNI DOME INDOOR R/C SCALE EVENTS
March 1,2, 2003, Cedar Falls, IA
Sponsored by Sig Mfg. Co.
Events:: Indoor R/C Fun Scale and Indoor R/C Sport Scale plus the following free flight events.

NON RULE BOOK FF EVENTS
NO-CAL PROFILE SCALE (similar to FAC guidelines)

1. A simple event for recognizable profile with a wingspan limit of 16 inches and single surface covered with Jap tissue or the equivalent.
2. Total of three flights to determine score. Highest score wins. Flyoff to break ties.
3. Ant flight of 20 seconds or more is official. All flights hand launched. No maximum flight time.
4. Model must have control outlines, registration or letters, windows, or windshield and open fuselage. Wheel wells for retractable gear must be shown where applicable.
5. Models must be in color scheme of any of the ones used on original aircraft.
6. Models must have full landing gear. No profile landing gear allowed. Retractable gear may be in the up position.
7. All wing struts must be on the model. Judges decisions are final.

ONE DESIGN DURATION - based on the AMA Cub as kitted by Sig. Mfg. Co.
Jr. class - 15 and under.

1. Must use the AMA Cub (delta dart) kit by Sig. Mfg. Co. The stock plan/covering, prop assembly, and wood sizes must be used. No tissue, undersized wood, or changed outlines or dimensions allowed.
2. Rubber motors may be altered to suit conditions.
3. The highest total time of two flights will be added to make the final score. Highest time wins. Five attempts are allowed. Any flight over 10 seconds counts as an attempt.

OPEN CLASS (Let's see what the old guys can dream up)

1. Must use the AMA Cub (Delta Dart) kit by Sig mfg. Co. The stock plan/covering and prop assembly must be used.
2. Scoring to be the same as Jr. class.

ELECTRIC DURATION RULES
Indoor Electric Duration (RC) For event 627
Plane shall not exceed 21 ounces flying weight. Maximum wing loading shall not exceed 3 ½ ounces per square foot.
Battery size is limited to six (6) 50 mAh cells. The plane shall fly a circular or oval or figure 8 course as specified by the judges. Either ROG or hand launch is permitted. Total points will be duration time in seconds. Contest Director will determine number of events allowed.

FREE FLIGHT ELECTRIC POWER
For event 221
1. Model Specifications. The models shall be powered by no more than two (2) Nickel Cadmium 50 mAh cells and may weigh no more than one ounce. There shall be no other restriction on model size or configuration.
2. Scoring. Scoring shall be based on the duration of the best single flight of three (3) attempts.
3. Timing. Time shall be recorded in minutes and seconds, with fraction of seconds dropped. Timing shall begin when the model is hand launched, and ends when the model touches the floor or contacts any part of the building and ceases traditional movement for longer than ten (10) seconds.

Publishers note:
This event is primarily RC. The free flight events are scheduled to fit into the RC flying. The HVAC system will NOT be turned off.

Fly hours will be from 6pm to 11pm on Saturday the 1st and from 7am to 4pm on Sunday.
Contact Name : Bob Nelson, 433 Ardmore, Waterloo IA 50701. E-mail : bobsrc@forbin.net
Day Phone : 319-277-0211 Night Phone : 319-233-4771

CargoLifter Loafer by Laurie Barr

This EZB/F1 L is number 4 in the series built over the last 5 years. Its forerunner's had by now become heavy with age and repairs, and knowing I was going to the Cargolifter hanger, and the immense height available, I went to a lot of trouble to ensure great stiffness, while keeping the airframe to 1.2 grams.

Most EZB's only fly in low ceilings, are much too floppy, and cannot cope with the huge launch torque required to make the most of very high ceilings, like Cardington etc. As the great American Sal Taibi once remarked "Altitood is everything"!

This year in Hanger 1, we have enjoyed relaxed flying, and more people have turned up to fly. Many of their models are built with ordinary balsa, with sagging wings and tailbooms, and the contortions they make when fully wound, wastes all the first burst of rubber power, and they never reach the roof!

Having now defined the detailed structure, I went to great lengths to test all the wood used, to find the highest S.C (Stiffness Coefficient *) rating I could.. I was fortunate, in that some of the wood used, was donated ("Extracted under duress"!) from Bernie Hunt, some of which had a S.C rating of 130!

I was determined not to exceed 1.2 grams, so I built and covered the whole model except the motorstick, and weighed the structure to find the amount of weight I could use in the motorstick, which would have to cope with almost every turn I could apply to it, without too much twist that would warp the wings too far on launch, or bow the motorstick to give too much downthrust.

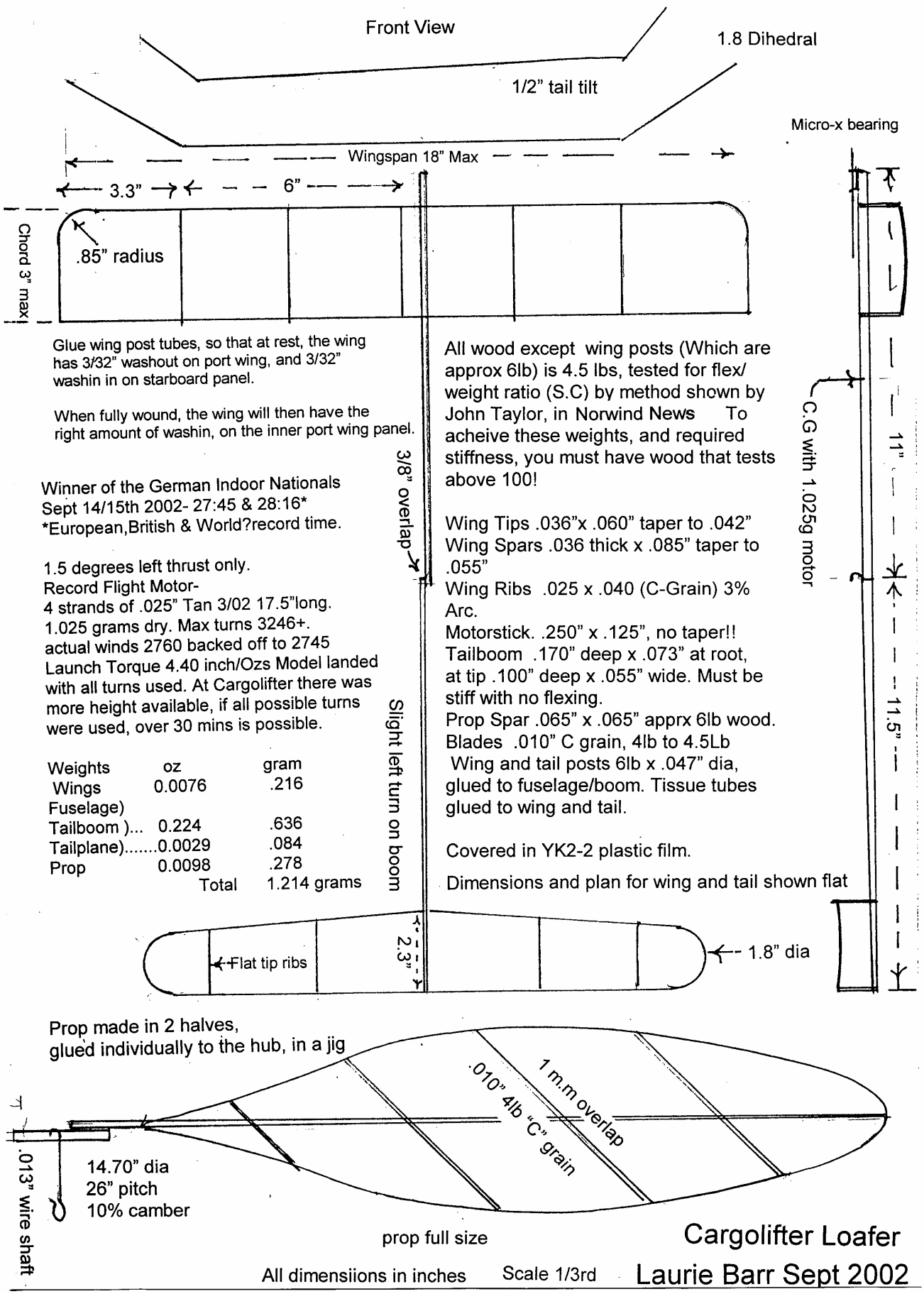
In amongst my rag-bag of "treasures", I found a piece of 1/4" x 1/8", that was exactly what I was looking for, and did not require, any shaping to bring it down to weight. It had Red "spidery" writing on it, just like Bernie Hunts hand produces! ! The end result of all this, is a model that seems to be able to take any amount of launch torque, and is launched vertically like a Javelin, and climbs without hesitation to great heights.

I hope to return next year, and give it all the motor can take, and just see if I can reach the roof at Cargolifter, 320 ft above!

-Laurie Barr. Oct 2002

* I enclose a copy of the original article By Bernard Hunt and John Taylor. Maybe the Editor will publish this not to hard to follow measurement of strength and weight testing.For those not willing to do this, make several motor sticks, tailbooms, Wing Spars, and do a simple deflection test with a small weight, which will at least tell you, which of each, is the best you have! It will not tell you that it is good enough, as compared to S.C testing, until you test fly the whole model, but it is still better than guess work.

(Editors note: We published the balsa testing process in the previous issue of INAV)


Front View
1.8 Dihedral
1/2" tail tilt
Micro-x bearing
Wingspan 18" Max
3.3"
6"
Chord 3" max
.85" radius
Glue wing post tubes, so that at rest, the wing has 3/32" washout on port wing, and 3/32" washin in on starboard panel.
When fully wound, the wing will then have the right amount of washin, on the inner port wing panel.
3/8" overlap
Slight left turn on boom
All wood except wing posts (Which are approx 6lb) is 4.5 lbs, tested for flex/ weight ratio (S.C) by method shown by John Taylor, in Norwind News To acheive these weights, and required stiffness, you must have wood that tests above 100!
Wing Tips .036"x .060" taper to .042"
Wing Spars .036 thick x .085" taper to .055"
Wing Ribs .025 x .040 (C-Grain) 3% Arc.
Motorstick. .250" x .125", no taper!!
Tailboom .170" deep x .073" at root, at tip .100" deep x .055" wide. Must be stiff with no flexing.
Prop Spar .065" x .065" apprx 6lb wood.
Blades .010" C grain, 4lb to 4.5Lb
Wing and tail posts 6lb x .047" dia, glued to fuselage/boom. Tissue tubes glued to wing and tail.
Covered in YK2-2 plastic film.
Dimensions and plan for wing and tail shown flat
C.G with 1.025g motor
11"
11.5"
Winner of the German Indoor Nationals
Sept 14/15th 2002- 27:45 & 28:16*
*European,British & World?record time.
1.5 degrees left thrust only.
Record Flight Motor-
4 strands of .025" Tan 3/02 17.5"long.
1.025 grams dry. Max turns 3246+.
actual winds 2760 backed off to 2745
Launch Torque 4.40 inch/Ozs Model landed with all turns used. At Cargolifter there was more height available, if all possible turns were used, over 30 mins is possible.
Weights oz gram
Wings 0.0076 .216
Fuselage)
Tailboom)... 0.224 .636
Tailplane).....0.0029 .084
Prop 0.0098 .278
Total 1.214 grams
Flat tip ribs
2.3"
1.8" dia
Prop made in 2 halves,
glued individually to the hub, in a jig
.010" 4lb "C" grain
1 m.m overlap
.013" wire shaft
14.70" dia
26" pitch
10% camber
prop full size
All dimensiions in inches
Scale 1/3rd
Cargolifter Loafer
Laurie Barr Sept 2002

US Indoor Championships 2003 Johnson City, Tennessee

May 30 – June 3, 2003

See the Contest Calendar for contact information. Forms and details are available online in the Contest Listings section of www.IndoorDuration.com

UNITED STATES INDOOR CHAMPIONSHIPS 2003 SCHEDULE

	7:30 2:00	2:01 3:00	3:01 6:00	6:01/6:30	6:31 10:00	
	IHLG	P-24 LAUNCH*				
WEDNESDAY	STD. CATAPULT	AT 2:30	INTERMEDIATE STICK	NO LAUNCH RETRIEVAL	INTERMEDIATE STICK	
28 MAY 2002	UNLIM. CATAPULT		35 CM *		35 CM *	
	RTP SPEED *					
	STRAIGHT LINE SPEED *					
	RACE TO THE ROOF *					
	7:30 1:00		1:01 4:00	4:01/4:30	4:31 10:00	
	FAC PEANUT *					
THURSDAY	BOSTONIAN			NO LAUNCH RETRIEVAL		
29 MAY 2003	HI WING MONOPLANE *		F1D		F1D	
	PIONEER *		HAND LAUNCH STICK		HAND LAUNCH STICK	
	MODERN CIVIL PRODUCTION *		CABIN ROG		CABIN ROG	
	WW 1 MASS LAUNCH * 1130					
	BOSTONIAN MASS LAUNCH 12:30 *					
	UNLIMITED RUBBER SPEED *					
	7:30 12:00		12:01 3:30	3:31/4:00	4:01 10:00	
	AMA SCALE			NO LAUNCH RETRIEVAL		
	KIT PLAN SCALE		MINISTICK		MINISTICK	
FRIDAY	DIME SCALE *		EZ-B		EZ-B	
30 MAY 2003	PISTACHIO *		F1L *		F1L *	
	SCIENCE OLYMPIAD.*		A ROG *		A ROG *	
	7:30 1:00		1:01 3:00	3:01/3:30	3:31 7:00	7:01 10:00
	FAC SCALE *			NO LAUNCH RETRIEVAL		
	GOLDEN AGE *					
	COCONUT SCALE *					AUTOGIRO
SATURDAY	NO CAL SCALE *		PENNY PLANE		PENNY PLANE	HELICOPTER
31 2003	AMA PEANUT		MANHATTAN		MANHATTAN	ORNITHOPTER
	SCIENCE OLYMPIAD *		ELECTRIC DURATION		ELECTRIC DURATION	A-6 *
	WW II MASS LAUNCH 10:30 *					
	COCONUT MASS LAUNCH 11:30 *					

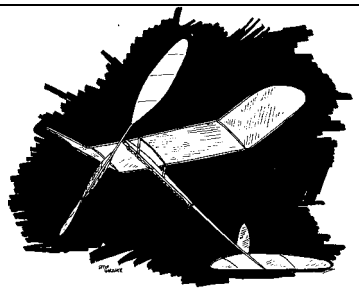
	7:30 11:30	11:31/12:00	12:31 3:00	3:01 6:00
		NO LAUNCH RETRIEVAL		
SUNDAY	LIMITED PENNYPLANE		LIMITED PENNYPLANE	PREPARATION TO DEPART
1 JUNE 2003	F1M*		F1M *	THE BUILDING MUST BE CLEARED
				PRIOR TO 6 PM
				*= NON AMA EVENTS
				HAVE A GREAT WEEK !!!!

GOLD NUGGETS

MERRY CHRISTMAS and THOUGHTS FOR THE NEW YEAR

by Alan Cohen

gleened from the Indoor List



It was this time last year that I purchased a few gliders as stocking stuffers as well as my first Guillows stick and tissue 'toy' for the kids. My only model airplane experience before that was the proverbial paper dart. I used to think I was pretty well rounded and knew at least a little about a whole lot of things, but I never knew this world of indoor free flight existed at all. It still amazes me.

Well it has been a year and the indoor bug has bit me hard. I've gone from my first EZB kit that weighed over 2g to the magic of 400mg EZBs that seem to float in air and mesmerize all who see them fly. I look forward to another year of wonderment and all the challenges and frustration that go with it all.

I would just like to say that the best part of this hobby has been all the interesting people I've met along the way. While there are many that enjoy this bizarre activity when exposed to it, there aren't many who pursue it. I am proud to consider myself one among you. The reasons we do this would make for a very interesting thread, but I've been through more than enough in this lifetime to consider life far too important to take seriously. I am sure I'm not alone.

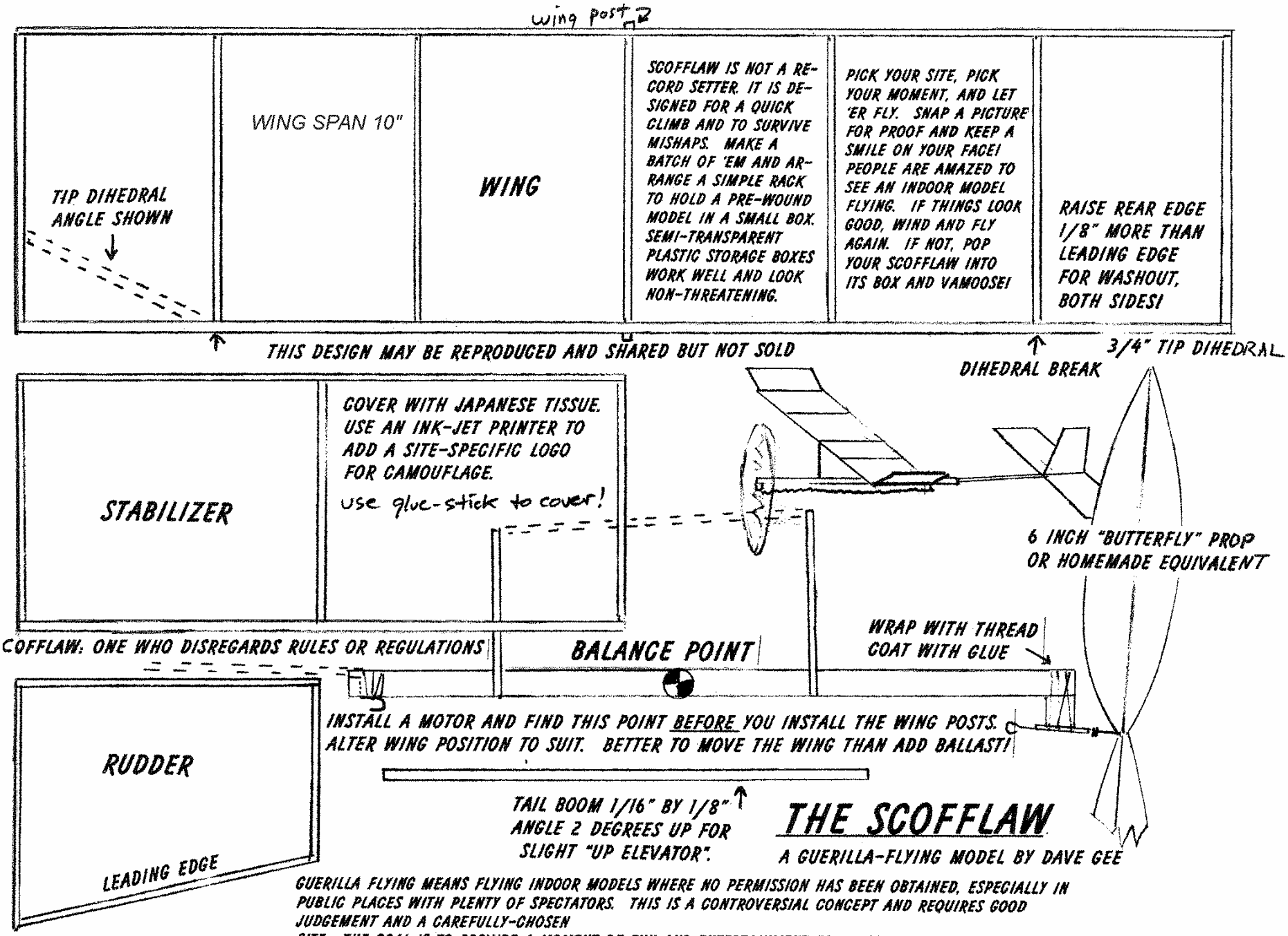
There are some that would consider what we do an utter waste of time. I would argue, isn't everything ultimately an utter waste of time! We might as well enjoy the time we're wasting.

As I look around I see so many people rushing here and rushing there...spending so much time doing things FOR their kids they forget to do things WITH their kids. This time of year reminds us once again, it is all about the children. It is not the presents they really want, it is OUR TIME to enjoy them together. Someone once asked me if I could do one thing over again what would it be. My answer was...to have a catch with my dad in our old backyard one more time.

The unusual thing about model airplanes is that is bridges all age barriers. Pass it on....it means more than you can imagine.

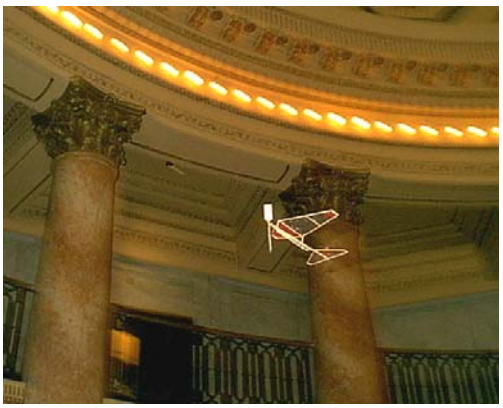
Merry Christmas to all.

Alan Cohen



GUERILLA FLYING MEANS FLYING INDOOR MODELS WHERE NO PERMISSION HAS BEEN OBTAINED, ESPECIALLY IN PUBLIC PLACES WITH PLENTY OF SPECTATORS. THIS IS A CONTROVERSIAL CONCEPT AND REQUIRES GOOD JUDGEMENT AND A CAREFULLY-CHOSEN SITE. THE GOAL IS TO PROVIDE A MOMENT OF FUN AND ENTERTAINMENT FOR PASSERS-BY AND POSITIVE EXPOSURE FOR INDOOR FLYING.

Guerilla Indoor Flying
by Dave Gee stukadave@cs.com



Right: Parlormite in Los Angeles County Museum of Natural History

"Guerilla Indoor Flying" is the practice of flying an indoor model without permission, especially in a public place, with the goal of delighting passers-by who might never otherwise see an indoor plane in action. Proponents have established an etiquette of accepted techniques to help discourage ventures that could cast a negative light on our sport. The concept involves very lightweight rubber-powered models, generally smuggled into the site fully-wound. A well-chosen venue has fairly still air, plenty of space overhead, and steady pedestrian traffic. The plane must be utterly harmless to all objects it may strike, human or structural. Photography is encouraged, to help in sharing one's exploits over the internet.

The basic concept is nothing new. Individuals have launched planes in interesting but unauthorized sites ever since indoor model flying began. I myself once set an unofficial record for indoor helicopters of 500mph at 34,000 feet in a Pan Am airliner cabin. This record might never be broken because Pan Am went out of business shortly thereafter, hopefully for reasons unrelated to my activities.

With the rise of internet communication, word of such isolated adventures could be spread worldwide accompanied by color snapshots. If conventional indoor modeling was a bit sedate, a Man Of Action could achieve fame overnight (if he avoided arrest).

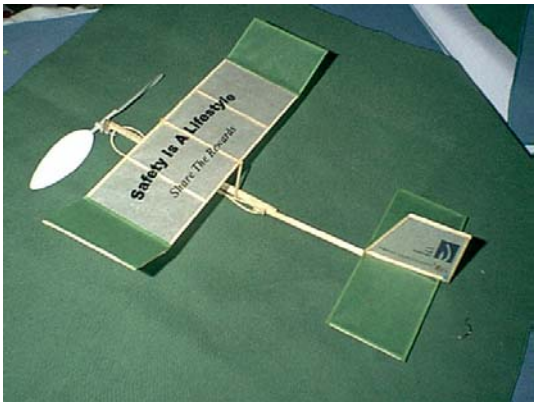
At the turn of the century Guerilla Flying was becoming not just popular but controversial, as opponents argued that such antics risked our already precarious access to legitimate sites. Websites hosted stimulating discussions on whether Guerillas should be encouraged or suppressed. Suddenly, the 9/11 attacks settled the question. Such shenanigans were, at least for the moment, clearly inappropriate.

Now the guerilla flyers are timidly re-emerging. As an ardent proponent, I decided to test a specialized design called Scofflaw. Like a cheesy superhero with a secret identity, the prototype has performed at many classroom demonstration sessions, trimmed for level flight. However, when retrimmed for a fast climb it has occasionally ventured into forbidden airspace. Simple, sturdy construction helps Scofflaw survive being smuggled and flown in unusual places.

In today's security-conscious society a guerilla flyer must carefully choose his site and never appear furtive or suspicious. Use a semi-transparent plastic box to hold a pre-wound Scofflaw and a winder. No tools, nothing harmful. If possible bring some kids along to help. You will be busy so have someone else do the photography. Wear a smile and keep a friendly attitude. Choose an open area slightly off the beaten path, so as not to create a traffic-jam hazard. Launch at an opportune moment and the fun begins. Interested spectators will immediately pepper you with questions. Usually, 1 or 2 nice flights and a departure can be made before being noticed. If an authority figure does object, politely apologize and quickly pack up. The crowd will generally take your side and provide verbal cover for your escape.

Do these techniques work? Anonymous Los Angeles guerillas have made flights in Union Station, the Natural History Museum rotunda, and a helicopter ascent in the Downtown Main Library atrium. The Ontario and San Diego convention centers have been similarly defiled. Coincidentally I have the pictures to prove it.

Scofflaw in flight. Major hotel, lobby atrium, 5:00 am



Scofflaw prototype, wearing computer printed tissue with Guerilla-Flying camouflage corporate logo

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The First Gorilla E-Postal Contest
By Mark “Gorilla” Bennett

Having flown my Limited Pennyplane in about 600 classrooms over the past 5 years, I still get a lift from watching students' reactions. I'll never forget overhearing a certain comment. A 5th grade boy whispers to a friend, "Gee...his toys are BETTER than our toys." While such classroom flying would not qualify as guerilla flying, experienced indoor fanatics should seek opportunities to expose the beauty of slow flying indoor models to the public. Guerilla flying, as described on Dave Gee's Scofflaw plan, means "flying indoor models where no permission has been obtained, especially in public places with plenty of spectators. This is a controversial concept and requires good judgment and carefully chosen site." A newcomer to indoor, Alan Cohen, described his first experience flying his Ministick in a shopping mall and mistakenly called it "Gorilla" flying. A few participants on the indoor mailing list http://groups.yahoo.com/group/indoor thought his misnomer was more appropriate in a post-9/11 world--a bit more humorous, less threatening than "guerilla."

Why not use the postal contest format to combine some elements of contest flying with 'rilla flying? The First Gorilla E-Contest will attempt to fuse serious flying--AMA Ministick--together with flying in public places, possibly unwelcome by authorities, but probably enjoyed by public. The number of people who stop to gawk at flight are multiplied by flight time. For measuring purposes, it's important that spectators STOP to watch. Hopefully, out of those spectators who stop, some will want to chat with the flyer, who can perhaps offer whatever follow-up appropriate, such as phone number, or a prepared handout sheet. Some situations, such as captive audiences, do not count in this contest, even though the situation may be laudably gorillian. For example, a football stadium has a mostly seated, captive audience, so those seated would not count, nor would a classroom, nor a bored board meeting. Shopping malls are ideal. 2003 winner will receive the "Plastic Gorilla" trophy. Also, Top Gorilla for 2003 gets privilege of adjusting the rules if desired, for 2004, after discussing such with the Yahoo indoor list. Entries should be posted online to http://groups.yahoo.com/group/indoor through April 30, 2003. Snail mail entries can be sent to Gorilla Bennett, 1315 F St. #5, Sacramento, CA 95814. Feel free to share accompanying story about your Gorilla experience. Keep in mind the goal for the First Gorilla E-Contest is to generate positive reaction to indoor free flight. But be prepared to leave quickly when asked, or preferably before asked! Be safe, be friendly, be a Gorilla.

Rules for First Gorilla E-Contest, 2003.

1. Eligible flights are flown with Ministick design per AMA rules.
2. Score shall be time in minutes and fraction of minute multiplied by the number of spectators who stop to watch flight. Example: flight time, 1 minute, 30 seconds, 7 spectators. Score-10.5 spectator minutes.
3. A spectator is someone, previously unknown to flyer, who comes to complete stop for at least 10 seconds, as judged by the flyer.
4. Flyer may time his/her own flights.
5. If flyer is arrested, jailed, shot, or forcibly removed by law enforcement, all flights made by flyer are disqualified for purpose of Gorilla E-Contest. However, to be otherwise "kicked out" of site does not render flights invalid.
6. Scores are eligible on flights made from Jan.1, 2003 to April 30, 2003.

Entries to: Gorilla Bennett, 1315 F St. #5, Sacramento, CA 95814
e-mail: KBT45231@AOL.com

Originally published in INAV January 1971

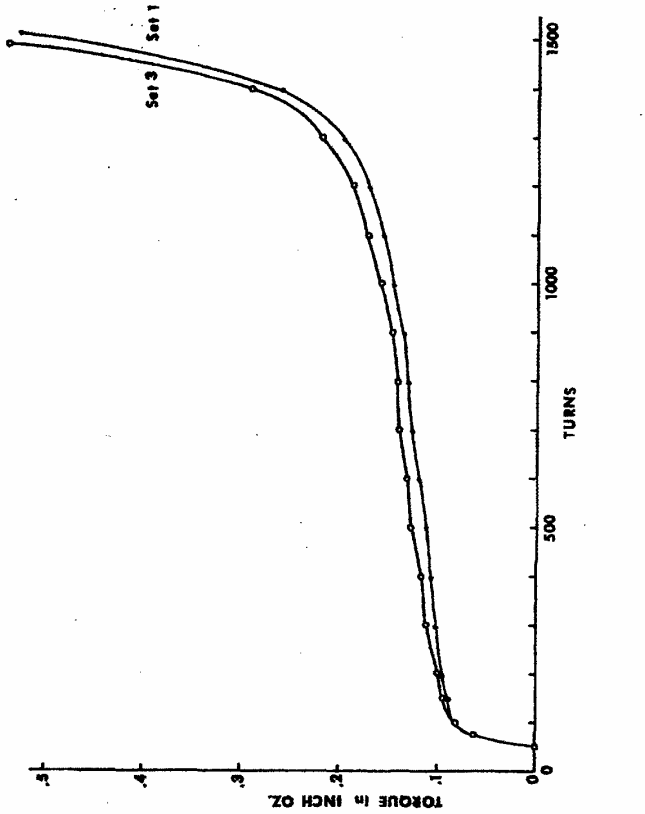
THE LAB

Artificial Aging of Rubber

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

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

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



Pigtail Bearings 101

By Alan Cohen

I have always liked building things, especially from wood. From furniture to acoustic guitars to golf clubs, I love starting the day with nothing but an idea and some wood, and ending up with something that works. Like myself, anyone who 'builds things', whatever it might be, has inevitably come across the need for a third, or better yet, fourth hand. You can have all the vises and clamps in the world, but sometimes nothing will work as well as some extra appendages.

Nowhere have I found this to be truer than in the world of indoor duration model airplanes. Granted, I have only been involved in this little obsession for a year, but I still haven't found a clamp or vise yet that will help me hold that broken, Y2K2 covered, .035" x .025" wing spar together while I get out the glue bottle and apply just the right amount in just the right place and hold it all together in perfect alignment for the obligatory 15 minute cure time.

This brings me to my dilemma with pigtail bearings and the reason for this article.

Not being fortunate enough to have a local mentor, I have had to resort to learning almost everything from reading and trial and error. I am one of the lucky ones who has been able to obtain a copy of Ron Williams' book, "Building and Flying Indoor Model Airplanes", and between that, the INAV archive and the inspiration of a few friends, I have been able to get a few models off the ground.

At first I didn't know pre-made aluminum thrust bearings existed so my first couple of models had bearings made from music wire per Ron's instructions. I wasn't concerned about weight and my first attempts were a 2+-gram EZB and a 4.5-gram Limited Pennyplane with bearings made out of .020 wire. After lots of tweaking they came out okay…heavy, but okay.

My next 'enlightened' versions were made with aluminum bearings and how I relished the ability of being able to skip that awkward step. The honeymoon was short-lived, however. After several more models, I discovered a few serious drawbacks to the aluminum bearing. First, was getting it to stay glued to the motorstick. I lost the majority of two planes due to the untimely disassembly of the bearing while fully loaded with rubber. Second, was the clearance limitation under the motorstick. I found myself adding shims to get the right amount of clearance and subsequently another unnecessary glue joint to the mix. The third was inconvenient down thrust adjustments. Aluminum just doesn't lend itself to bending back and forth. Fourth was weight. Sure I could shave down the aluminum to lighten it up, but by the time I did that I could have made a pigtail. Plus, with pigtails, I can use whatever size wire fits the weight of the model. I am not bound to a 'one size fits all' bearing. And last as well as least was cost. I could make 20 pigtails for the price of an aluminum bearing.

So I had come full circle, back to making pigtails again. But now I had another problem. During the construction of the previous few models, with the help of the Hobby Shopper article and the investment in a scale, I had learned to build lighter and lighter. Then I came across Larry Coslick's Micro-B article in INAV 107. My mind expanded more in the next few weeks than it had throughout the entire '70s. Along with getting my brain around 20mg prop spars, 30mg prop blades, 32mg tail booms and 13mg stabs, I had to make pigtail bearings from .008 wire on a .009 mandrel. It's a good thing there isn't a videotape of me trying to make one of those little beasties, because I surely would be institutionalized with good cause. There was just no way I could keep the mandrel straight while bending the bearing around it.

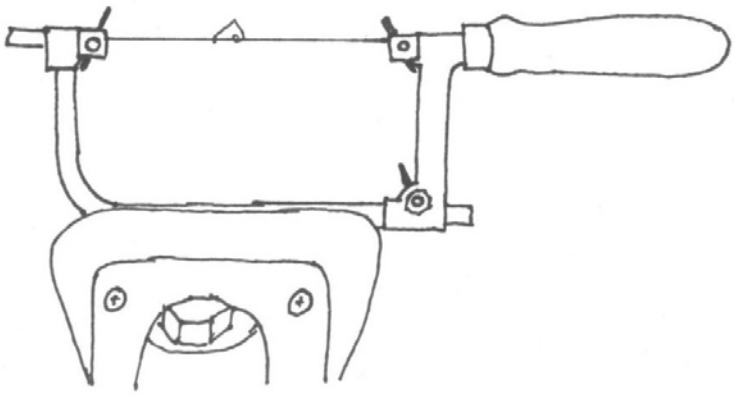
After several nights waking up in a cold sweat, pondering just how I could accomplish this Herculean task, it came to me. I needed four hands…two to keep the mandrel straight and two to bend the bearing. Now, where could I get two more hands? I needed something that would not only hold each end of the mandrel, but could pull it taught. I thought of stringing a full-length piece of .009 wire in a guitar and tuning it tight. That would work, but a bit of a pain. I could make a jig with a guitar tuner. That would work too.

Then I saw it…hanging innocently from my pegboard…my jewelers saw! With two thumbscrew clamps to hold the wire instead of the blade and another to pull it tight and the whole thing clamped upside down in my vise, I couldn't

believe how simple the solutions was. Since I've never been accused of being the sharpest razor in the box and I'm sure others have discovered this shortcut, I couldn't believe I had never read about this method anywhere before. I was now making 10 bearings in the time it took to make one and making them far more accurately. By having the mandrel pulled taught, it became very easy to make adjustments while maintaining prop shaft alignment. After each tweak it was easy to just give the bearing a spin to see if it was still true. By dry fitting the sliced motorstick, I could now make thrust adjustments before permanently mounting the bearing on the motorstick. I was in modeling heaven.

The exact step-by-step process of making a pigtail bearing has been well documented and is beyond the scope of this article, as well as my artistic ability, but if anyone is interested there is a very detailed picture demonstration at http://www.indoorfreeflight.com/wirenose.htm. Just insert a $10 jewelers saw into the process and you are in business.

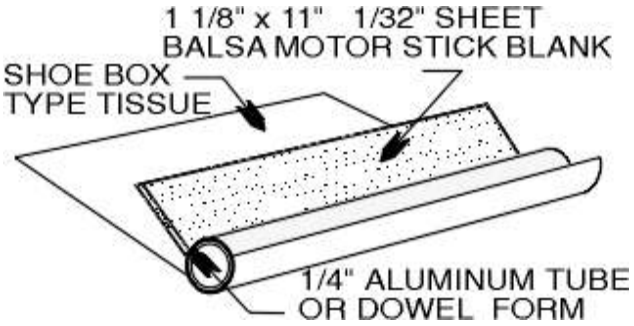
In my opinion, there is nothing more elegant than a well made pigtail bearing. It's easy to notice a well-covered wing, or a poker straight boom, but not much attention is ever paid to the bearing when ogling a model. The elegance is not so much in what it looks like, but in what it does to a stopwatch. Models these days are pushed to the very limits of balsa and rubber and when you consider how much of a models efficiency and flight profile is wound up in that little piece of wire, it is impossible to pay too much attention to it. I have heard flyers say the magic happens when you get the right prop/rubber combination. Well, the only thing holding them together is the thrust bearing. Make it a good one.



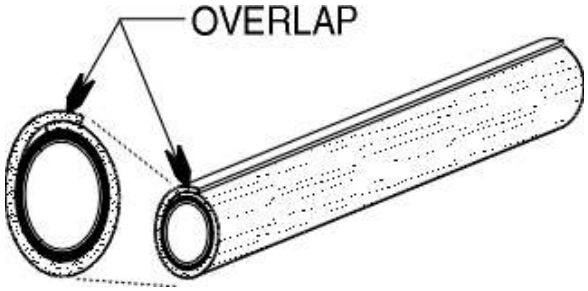
NO-CAL ROLLED BALSA TUBE

MOTOR STICK CONSTRUCTION

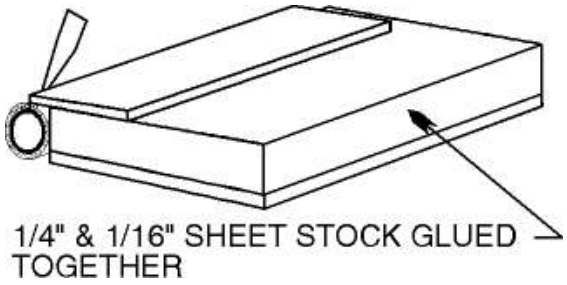
By Paul Bradley



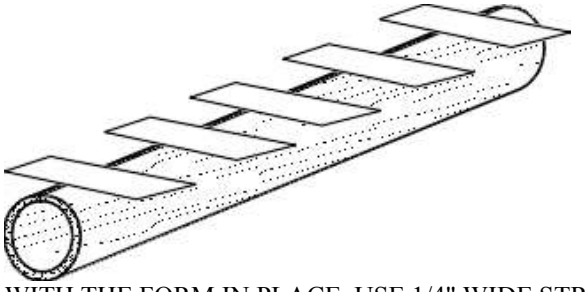
1. HOLD THE MOTOR STICK BLANK UNDER HOT RUNNING WATER FOR SEVERAL MINUTES.
2. MAKE ONE WRAP AROUND THE FORM WITH THE TISSUE.
3. PLACE THE WET BLANK BETWEEN THE TISSUE AND THE FORM AS SHOWN.
4. ROLL THE FORM ON TO THE TISSUE CAPTURING THE BALSA BLANK AS YOU GO. ROLL THE ASSEMBLY UNTIL 5 OR 6 WRAPS OF TISSUE HAVE OCCURRED.
5. HOLD THE ASSEMBLY TOGETHER WITH BANDS OF MASKING TAPE PLACED ABOUT 2" APART.



6. LET THE ASSEMBLY DRY OVER NIGHT, OR BAKE FOR 15 MIN IN AN OVEN ON LOW HEAT.
7. AFTER THE ASSEMBLY IS DRY, REMOVE THE MASKING TAPE AND THE TISSUE PAPER. YOU MAY NEED TO SLIDE THE FORM OUT OF PLACE TO BE SURE ALL TISSUE PAPER IS REMOVED.
8. THERE SHOULD BE AN OVERLAP WHERE THE EDGES OF THE BALSA BLANK COME TOGETHER.
9. SLIDE THE FORM BACK IN TO THE ASSEMBLY.



10. MAKE UP A TRIM SUPPORT BASE FROM PIECES OF 1/4" AND 1/16" STOCK AS SHOWN.
11. USING MASKING TAPE, ATTACH THE MOTOR STICK AND FORM UNIT TO THE SUPPORT BASE. THE OVERLAP SHOULD BE FACING UP.
12. LAY A STRAIGHT EDGE ON THE MOTOR STICK AND SUPPORT BASE AS SHOWN. MAKE SURE THE CUTTING GUIDE EDGE IS PARALLEL WITH THE UNIT, AND CENTERED IN THE OVERLAP AREA.
13. CUT THROUGH BOTH LAYERS OF THE OVERLAP ALONG THE STRAIGHT EDGE.
14. AFTER THE CUT IS MADE, REMOVE THE MASK- - ING TAPE AND THE TWO STRIPS OF SCRAP MATERIAL.



15. WITH THE FORM IN PLACE, USE 1/4" WIDE STRIPS OF MASKING TAPE TO "CLAMP" THE JOINT TOGETHER. MAKE SURE THE JOINT IS STRAIGHT.
16. SLIDE THE FORM OUT OF THE BALSA TUBE.
17. WICK CA ADHESIVE INTO THE JOINT BETWEEN THE TAPE STRIPS. A SMALL AMOUNT WILL COVER A LOT OF AREA.
18. WHEN THE CA HAS FULLY SET UP, REMOVE THE TAPE STRIPS. LIGHTLY SAND.

CARGOLIFTER PHOTO ALBUM
SEPTEMBER, 2002

Cargolifter in Autumn

The Czech Team

The Lineup of Tables

Paula & John Tipper, Ron Green, Andras Ree, Laurie & Betty Barr

Well Prepared Bob Bailey of Britian's F1D Team

A lot to See in the Area

EUROPEAN F1D CHAMPIONSHIPSFOR SENIORS AND JUNIORS.
OPEN INTERNATIONAL FOR F1D, F1L AND F1M.
'CARGOLIFTER 'HANGER, BREISEN-BRAND, GERMANY.

The schedule of events is:

THURSDAY	**OCTOBER 2ND.**	**Arrival, registration and team Managers meeting.**
FRIDAY	**OCTOBER 3RD.**	**08.00-13.00 registration & practice.**
		13.30 opening.
		14.00-18.00 round 1 flights.
		16.00-20.00round 2 flights.
SATURDAY	**OCTOBER 4th.**	**08.00-14.00 registration & practice.**
		14.00-18.00 round 3 flights.
		16.00-20.00 round 4 flights.
SUNDAY	**OCTOBER 5th.**	**08.00-14.00 registration and practice.**
		14.00-16.30 round 5 flights.
		15.30-18.00 round 6 flights.
		20.00-24.00 banquet & prizegiving.

Entry fees will be CHF (Swiss Francs) 300 for senior competitors and CHF 255 for juniors. CHF 45 for senior supporters, CHF 30 for junior supporters. The banquet fee is 20 EURO'S for adults and 10 EURO'S for children under 14.

The accommodation and food is to be arranged by competitors. Hotel information will be available.

There will also be an OPEN INTERNATIONAL competition for F1D, F1L and F1M. This will be flown at the same time as the Euro' Champs in a different part of the hanger.

Given the financial state of the 'CargoLifter' company, the fate of the hall will now be decided by the local authorities and this may be the only time that the hanger can be used for such a championships.

This from the SCAT on-line newsletter
Posted by Rick Pangell TheMaxOut@aol.com

Telescoping Poles- A New Source

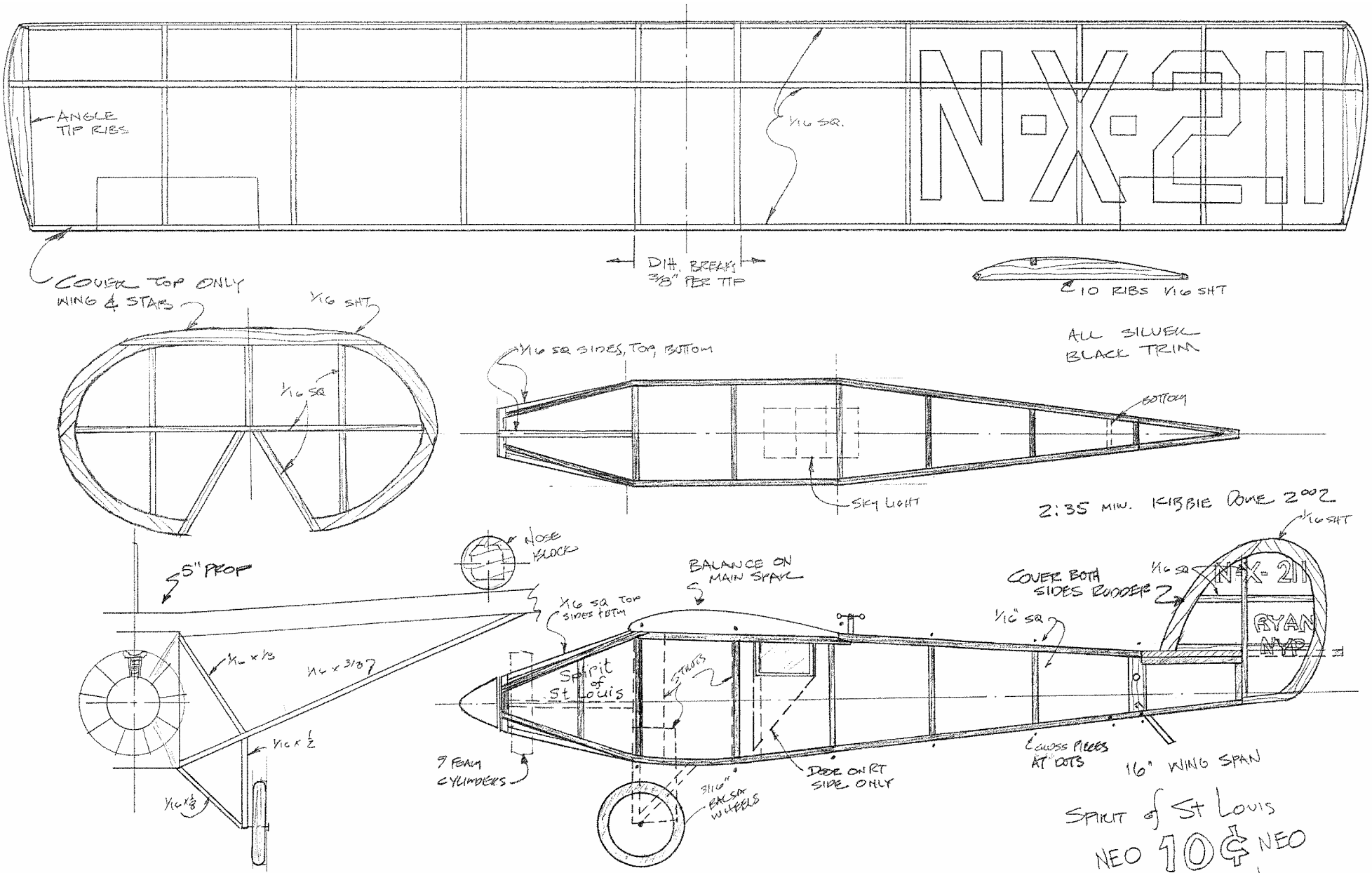
There's a line of fishing poles called "Wonderpole." They are billed as 20 feet long, six-section, telescoping. These are fiberglass base tubes and carbon fiber at tip and list for $19.95 at the Shakespeare website:

www.shakespeare-fishing.com

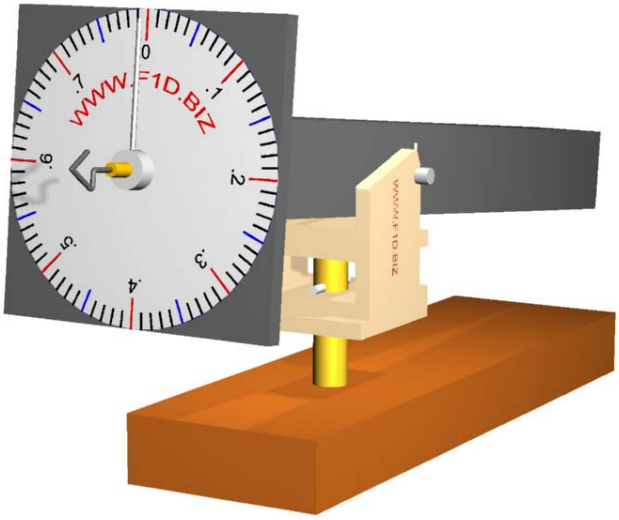
Click on the link "products" to "rods" to "Wonderpole" and the listing comes up. There is a description of the poles offered. The TSP-20 is the 20-footer.

They can also be obtained at:

www.eAngler.com


ANGLE TIP RIBS
1/16 SQ.
N-X-211
DIH. BREAK 3/8" PER TIP
COVER TOP ONLY WING & STABS
1/16 SHT
1/16 SQ
10 RIBS 1/16 SHT
ALL SILVER BLACK TRIM
1/16 SQ SIDES, TOP, BOTTOM
BOTTOM
SKY LIGHT
2:35 MIN. KIBBIE DOME 2002
1/16 SHT
NOSE BLOCK
5" PROP
BALANCE ON MAIN SPAR
COVER BOTH SIDES RUDDER
1/16 SQ
N-X-211
RYAN NYP
1/16 SQ TOP SIDES BOTM
1/16" SQ
1/16 x 1/8
1/16 x 3/16
Spirit of St Louis
STAYS
1/16 x 1/2
1/16 1/8
9 FOAM CYLINDERS
3/16" BALSA WHEELS
DOOR ON RT SIDE ONLY
CROSS PIECES AT DOTS
16" WING SPAN
SPIRIT of ST LOUIS
NEO 10¢ NEO
by DAVE HAUGHT

Torque Meter Review
By Jake Palmer



I recently had the opportunity to purchase a new torque meter from Tim Goldstein of Tru-Weight Indoor Balsa and he asked me to share some of my thoughts on this new item so here they are.

The meter arrived in a small box heavily packed with foam peanuts. My first impressions as I unpacked the box were very good as the unit is quite attractive. The base consists of some laser cut plywood pieces that are preassembled. This plywood assembly rotates on a brass rod that is firmly mounted in a nice piece of oak. The meter itself is made of a charcoal colored plastic with a large wire pin in the middle of the body. This wire easily snaps into and out of the laser cut assembly on the base and acts as a pivot allowing the meter's face to move up and down. The face is a round piece of white paper attached to a square piece of plastic. This paper is printed with a nice scale that has large black numbers and ten clear lines dividing the space between each number. The face also has a clear plastic coating which protects the paper from rubber lube.

After playing with the meter for a while I went ahead and mounted the meter to a nice piece of oak that I set up as a winding stooge. I then went to work winding several motors to test the sensitivity of the meter. The action of the meter was very smooth as the pointer slowly moved around the scale while I was winding. When I was done winding I found it very easy to take readings off of the clearly marked face plate. I can't speak for the accuracy of the meter because I don't have a calibrated meter for a comparison, but based on past experience I would say the readings were right on.

The only feature I didn't like was the tendency for the face plate to drop after the rubber is taken off of the hook. I discussed this with Tim and discovered that he actually designed this into the meter. The idea is that when you unhook a fully wound motor, the face plate will drop out of the way as you attach the motor to the rear hook of your model. It's actually a good idea, but I prefer a neutral balance so I added some clay to the rear of the meter to balance it.

Overall this torque meter is a great tool and a very good value. The snap in feature of the base allows it to be used for all three of the torque ranges that Tim currently offers and saves money in the long run. Rather than buying an entirely new torque meter, you only need to buy the body and snap it into the base you already have. I have the 0.8 in/oz meter which is ideal for F1D. He also offers a 0.3 in/oz meter for lighter models like Mini-Stick and Easy B as well a 1.5 in/oz meter for heavier models like Pennyplane. If you don't have a torque meter and are looking to get one, I recommend you give www.F1D.biz a visit.

National Free Flight Society Symposium Archive CD set
By Jerry Combs

Well Tim Goldstein has done it again. First he collected and made available to all the Indoor News and Views archives, now he has done it for the National Free Flight Society Symposiums. He has gathered all of the symposiums from the first thru 2000 together in a very nicely done set of 4 cd's that can be accessed on your home computer. He has also included the World Championship and plans books and the Winning Indoor Designs book, all printable on your printer. Printing can be a very good way to fill in those moments when you are waiting for the glue to dry on your newest creation. It is wonderful to be able to find the article that you need without having to dig through piles of pages in the garage when the temperature is 20 or 115 degrees Fahrenheit, instead you can find the article or plans in the comfort of your home. I highly recommend that all who are interested in Free Flight purchase this set, it is well worth the price.

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Excerpts from a conversation on the Indoor list at Yahoogroups

Other than the motor stick breaking, what are other likely failures in F1D competition?

My guesses would be:

Mid-airs
getting hung up on parts of the building
wrecking the model when trying to steer with a balloon
air frame failure after a collision

Bill Kuhl

I don't fly F1D but here are some other possibilities:

1. Sneezing
2. A nervous tic.
3. A spectator (or a competitor) asks you a question during motor hook-up.
4. Someone walks by your table too fast and folds up your wing.
5. Someone's steering balloon bursts while you're walking to the launch area.

Bill Gowen

A comedy of errors: or how I have ruined F1D's and yes each of these has actually happened to me and no I am not particularly graceful. <grin> I am willing to bet that some of these have happened to all of you at one time or another even if you don't want to admit it except for maybe number 6.

1. bashing the stab off against my torque meter or holding stand while installing the motor.

2. bashing the stab into a spectator who was standing closer than I thought.

3. poking my steering pole through the wing while steering at a low ceiling site.

4. tripping and falling while walking out to launch.

5. tripping and falling on the model while retrieving it.

6. I tried using my wheelchair to fly at a local fun fly, my hat is off to Akihiro Danjo for being able to do this. You guessed it, I ran over the model when retrieving it with the wheelchair.

7. This is the one that has cost me the most models of all, spectators who have never been around indoor models reaching out to touch the model and crushing it. This has never been a problem at a major contest but it does happen at local contests.

Jerry Combs

Oh, and let's add to the list: a few months back, I had my Poonker ministick in its box with the winder taped in there beside it. On the way to the flying site, the box experienced a few bumps, (I blame one of my friends for the worst ones) and when I opened the box to fly it-you guessed it- the wing had been transformed into a little ball which was stuck to some tape, the tailboom and prop were broken, and the winder was on the other side of the box. RATS!!

Joshua Finn

En route to flying site for maiden flight of my first F1D. Model parts in cardboard box next to me. Put down car window. Incoming air blows open box. 4 F1D parts swirling around my head. Before I could brake, wing quickly plasters itself against my ear. Think "Y2K-hat." Wing totaled, Other parts reparable. Became instantly fluent in "Sailor."

Mark Bennett

I bet nobody had this happen to you. My hair got stuck on thye microfilm of the wing. I touched accidentally with the back of my head the underside of the wing and my hair and thus my head was stuck. My microfilm was in those days very sticky. And it happen on the first day on the 1978 World championships in Cardington. I got rescued by somebody who really did not know how to do this. My hair survived, my wing did not. And in 1976 at my first world championships my propellor box blew open in a freak wind storm outside. I had lots of building that week to get anything going.

Edmund Liem

I tend to like the rubber band breaking or coming off one of the hooks in flight. Guaranteed to damage a stab and/or prop with some damage to the motorstick. It gets even better when you attempt to patch the film and your wire gets too hot... Additional fun can be had when the motor breaks as you're loading it onto the motorstick, shredding the motorstick and breaking the front off of the stick at the web... oh well!

Jeff Daulton

Another embarrassing way to break an airplane: I launched my model, then decided I wanted to terminate the flight because something was out of adjustment (I can't remember what), but the plane was just out of reach & climbing, so using quick thinking I jumped up & grabbed the motorstick, unfortunately the wings did not come down as fast as the motor stick & I did.

Gary Hodson

How about tearing a wing in half with a steering pole while steering in a high ceiling? That is what happened to me on the first day of practice in the mine, and the only thing we had to steer with was a pole.

Matt Chalker

The torque meter hook grabs the trailing edge of the stab and rips the stab off as you walk away.

Stupid steering accidents. With the model about 1" above the top of the pole, and you miss the wing but you hit the middle of the stab and slice a hole in the film from the top of the pole's tip.

I have bent over to pick up a model and have my glasses slide off and go through the wing.

My other model demise came from my balloon exploding while I was winding the motor. It was slow motion as the balloon debris fell gracefully on the cabane, collapsing it and the model as it continued tot he table. Never flew that model , that was to be the maiden flight of my first 9" chord F1D model. I had built all night to get the wing done and got to Akron early only to destroy the model 30 minutes later. (I was like 16 years old).

Then there is the broken motor which flies up in the air and onto the wing grabbing the bracing and wrapping the wire in a fast ball of fury.

Ahh, the love of model airplanes, and as my dad use to say (and still says). "Well, that is all part of airplane building."

Don Slusarczyk

I am sure glad that this thread came up, now I don't feel like a complete idiot for the ways that I have destroyed some of my models.

Jerry Combs

If you have a computer and are connected to the Internet you should join us on this list. It is dedicated to indoor free flight only. It does not cost anything and you can either view the messages in your web browser or have them sent to you via e-mail. Stop by and visit at:
http://groups.yahoo.com/group/indoor/

Thanks to Don Slusarczyk for starting this group. It has been a great source of help and amusement to me.

Tim Goldstein

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